A MICRO-LEVEL VIEW OF LOW-INCOME RURAL HOUSING IN BANGLADESH

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ABSTRACT

Although the majority of the population of the developing world is rural, compared to urban housing there is less emphasis on rural housing in current literature. Bangladesh is a case in point, with its nearly 80% rural population with a low-income majority. Various agencies there attempt to address rural housing problems; in addition to government programmes, there is now an expanding network of NGO-based rural development programmes, including housing. This presents low-income households with a changing scenario within which their efforts to build housing operate. Agency-based housing efforts lack the benefit of rigorous research, especially one that reflects perceptions at the micro-level, primarily of low-income rural communities. This study addresses the need for in-depth and investigative research of strategies for dealing with housing problems of low-income rural communities, both by agencies and low-income households.

The principal thrust of the research is empirical. Agency projects representing a wide range of strategies and programme types were selected as case studies to study beneficiaries and other households in each project location. In-depth information was gathered from diverse low-income households in different geographical locations in Bangladesh, as well as from operational staff of agencies and other related persons. Literature review and background experience indicates that the housing process has three main aspects: financing, implementation and housing design. Data collection and analysis were conducted according to these aspects.

Despite various agency efforts to finance low-income rural housing, it was found that the poorest households generally tend to be excluded; among households funding their own housing, the rural majority, the poor face severe financial constraints. Implementation of housing programmes was studied mainly according to the level of household participation. Corruption was found a typical feature in many agency projects, often because of the limited nature of household participation; self-built housing usually proves advantageous to households, but is also affected by the permeation of the cash-economy. Agency-planned settlements are often not well-designed, but self-organised sites, despite meeting many local needs, face problems of infrastructure, tenure security and building material supply. Some durable types of construction, using manufactured materials, promoted by some agencies, have become popular, but most are unaffordable to the poor and face contextual problems. One the other hand, supply of less expensive natural materials is becoming tenuous because of increasing depletion of the natural resource base.

Analysis of empirical findings indicates some advantageous concepts, but in general the findings imply scope for improved policy and practice. This study allows for drawing out such implications for the financing, implementation and housing design of future low-income rural housing programmes.

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To low-income rural communities in Bangladesh

• *CHAPTER 1*

INTRODUCTION TO THE STUDY

1.1. INTRODUCTION

This study issued from an interest in investigating the rural habitat in developing countries where a predominantly low-income population resides. The main rationale behind the selection of this domain of study pertains to the fact that compared to the amount of studies on urban housing in the developing world, there is relatively less on rural housing (Borton *et al* 1992, pp. 107-108); by and large, rural housing has received much less emphasis than urban housing and has generally been relegated to a low priority in rural development programmes (UNCHS 1995, p. 1). The United Nations Conference on Human Settlements in 1996 was termed the 'City Summit' (United Nations 1995), indicating an urban emphasis in the field of settlements and housing. Yet the majority of the world's population is rural, concentrated primarily in Asia, which points to the importance of rural housing as a topic of study (Table 1.1.). Most of this population lives in the developing world, despite recent rapid urbanisation there (Tables 1.1. and 1.2.); Africa and Asia are expected to remain predominantly rural until 2010 (UNCHS 1995, pp. 2-3) and perhaps beyond (Table 1.2).

By 2010 the majority of the world's population is projected to be urban and even in the developing world rural and urban populations will reach similar proportions (Table 1.2.). However, the greater growth of an already higher population in the developing world in comparison to that in the developed world means that, in addition to increased urbanisation, in absolute numbers in the developing world there will be a large growth in the rural population also. It can even be argued that rapid urbanisation in developing countries has led to the emphasis on urban settlements because this transition is generally perceived as 'threatening', in contrast to rural settlements which appear 'benign' (Seabrook 1996, p. 7). In addition, the oft-quoted projection that the world's urban dwellers will soon exceed the rural population contains anomalies because of inconsistent definitions of urban boundaries and by the omission of large pockets of areas with rural characteristics within cities (UNCHS 1996, pp. 14-17). Although rural-urban differences are becoming subsumed by the expansion of the global and national economic network (Seabrook 1996, pp. 11, 12), distinct differences still persist in housing, in addition to other spheres.

Bangladesh is a classic case: about 80% of its population is rural and although it is expected that this will reduce to 60% by 2025 (still a high proportion) with a tremendous increase in the urban population, at the same time the rural population is expected to increase by 12 million (Table 1.3.) (UNCHS 1996, p. 447). Therefore, notwithstanding the importance of attending to urban issues in a rapidly urbanising developing world, rural areas in developing countries such as Bangladesh also demand attention. In this study, Bangladesh has been chosen as a typical example of a predominantly rural nation in order to carry out in-depth research on rural housing that may also have relevance to similar contexts in the developing world.

Table 1.1. Distribution of the world's total rural and urban populations, 1990 (*UNCHS 1996, p. 13*)

		Percent of the world's:		
Region	**Total population** (millions)	**Total population** (%)	**Rural population** (%)	**Urban population** (%)
World	5,285	100.0	100.0	100.0
Africa	633	12.0	14.4	8.8
Asia	3,186	60.3	72.2	44.5
Europe	722	13.7	6.7	22.8
Latin America & the Caribbean	440	8.3	4.2	13.8
North America	278	5.3	2.3	9.2
Oceania	26	0.5	0.3	0.8

Table 1.2. Global patterns of population distribution between rural and urban areas, 1995 and 2010 (*UNCHS 1995, p. 2*)

Continent	**Year**	**Total population** (per thousand)	**Urban** (%)	**Rural** (%)
Africa	1995	728,074	34.4	65.6
	2010	1,069,378	43.8	56.2
Asia	1995	3,457,957	34.6	65.4
	2010	4,263,948	44.3	55.7
Europe	1995	7,26,999	73.6	26.4
	2010	7,28,741	78.4	21.6
North America	1995	292,841	76.3	26.4
	2010	331,571	80.3	19.7
Latin America	1995	482,005	74.2	25.8
	2010	603,843	80.5	19.5
Oceania	1995	28,549	70.3	29.7
	2010	34,814	71.1	28.9
Less developed regions	1995	4,549,809	37.6	62.4
	2010	5,819,403	47.2	52.8
More developed regions	1995	1,166,598	74.9	25.1
	2010	1,212,865	79.3	20.7
World	1995	5,716,407	45.2	54.8
	2010	7,032,268	52.7	47.3

Table 1.3. Projected size and growth of urban and rural population in Bangladesh, 2000-2025 (*UNCHS 1996, p. 447*)

Level of urbanisation		**Urban population**			**Rural population**		
(% of total population in urban areas)		(thousands)			(thousands)		
2000	*2025*	*2000*	*2025*	Annual growth rate (%)	*2000*	*2025*	Annual growth rate (%)
21.28	39.99	28,603	78,430	4.03	105,814	117,699	0.43

In the rural context of Bangladesh, notwithstanding the preponderance of studies on urban housing in international development discourse, various agencies (primarily non-governmental organisations or NGOs) have recently begun to be involved in a variety of social development activities in rural areas, including housing. This has caused change in the rural habitat and thus demands study. Literature on the work of NGOs in Bangladesh (Hashemi 1995; Karim 1995; Sobhan 1997) mentions many fields of developmental intervention, but not housing. Agencies involved in rural housing thus lack guidance based on rigorous research for their programmes, a reason for carrying out this study. Suggesting such guidance requires an understanding of the successes achieved and drawbacks experienced in the field. This points to the need for evaluative research, the fundamental orientation of this study. This study investigates the effects of agency action in rural housing where the strategies of low-income rural households, those directly or not directly touched by agency action, to cope with the changing reality of their habitat is the primary basis of the research. It fulfils the to present the perceptions of low-income households of their housing experience, having to operate within the presently expanding framework of agency programmes. The study endeavours to gain a view of housing at the micro-level of low-income households, not at the macro-level of public or non-governmental organisational policy, although the effects of the latter on low-income households is examined.

1.2. THE RESEARCH SETTING

Given the above basis of selection of Bangladesh as the context of study, it is now necessary to delineate the research setting. Appendix A.1. presents a profile of Bangladesh to provide a general understanding of its main features. In this section some aspects of the national context relevant to this study are summarised.

1.2.1. Uneven resource distribution

Land is among the most important resources in the agrarian context of Bangladesh. Uneven land distribution is a topic covered widely in rural studies of Bangladesh (Bodley 1985; BRAC 1986; Cassen 1994, p. 49; Eckholm 1982, p. 24; Hafiz and Islam 1993, pp. 45-46; Hartmann and Boyce 1983, pp. 194-213; Hossain 1986; Jannuzi and Peach 1977; Jansen 1986; Mukherji 1986) but institutional effort to address it is limited. Policies for land reform and land-rights campaigns are encumbered by vested interests of elites, cultural patterns of land distribution and a general lack of education and organisational capacity among underprivileged communities to actively pursue legal remedies. Deduced from Table 1.4., between 1984 and 1992 the proportion of rural households owning less than 0.5 acres of homestead plus agricultural land (classified as 'landless' and 'functionally landless' households) increased by almost 7%, an increase of 3 million such households in a total increase of 4 million rural households.

It is beyond the scope of this research to deal directly with land distribution, but it should be borne in mind that it is an important aspect of the rural context within which efforts at building housing operate. Although much of the discourse on land distribution in Bangladesh deals with agricultural land, there are also reports suggesting that a substantial section of the rural population (15-20%)

do not own any homestead land, characterised as 'homeless', squatting on public land or dependent on patronage to reside on private land (Rahman 1993, pp. 1-2; Rahman and Huq 1994, p. 4).

Table 1.4. Distribution of rural land ownership in Bangladesh (*adapted from BBS 1995, p. 10*)

Land ownership groups (acres)	Agricultural census 1983-84 (% H/S)	HES 1988-89 (% H/S)	HES 1991-92 (% H/S)
Less than 0.05	18.1	18.2	17.6
0.05-0.49	28.2	34.7	35.5
0.50-0.99	12.0	10.8	11.5
1.00-2.49	21.6	18.4	19.7
2.50-4.99	11.6	10.7	9.4
5.00-7.49	4.7	3.7	3.2
7.50-14.99	3.0	2.7	2.6
15.00 and above	0.8	0.8	0.5
Total	100.0	100.0	100.0
Number of rural H/S (in million)	13.8	16.4	17.6

Notes:
1. HES = Household Expenditure Survey
2. H/S = Households
3. Landownership includes combined agricultural and homestead land

The gradual increase in non-agricultural employment in rural areas (Hossain 1995, pp. 62-65; Ullah 1996, p. 46) entails that income in general, not only from agricultural sources, is also an important resource. As with land, income distribution in Bangladesh is also highly skewed in favour of upper income groups. Rough estimates indicate that the top 20% income group within the population secures more than 40% of national income while the bottom 20% is left with about 7% (Jansen 1986, p. xii; Rabeer 1990, p. 187). According to official statistics, from the fiscal years 1983-84 to 1991-92, the national income of the bottom 20% income group has declined by 0.68%, while that of the top 20% has increased by 1.49% (Table 1.5.); the bottom 20% income group comprises more than 20% of households in the nation, while the top 20% even less than 1% (Table 1.6.).

Table 1.5. Distribution of income in Bangladesh (*adapted from BBS 1995, p. 40*)

Income accrued (%)	1983-84	1985-86	1988-89	1991-92
		Bottom 20%		
National	7.20	6.99	6.64	6.52
Urban	6.21	6.92	6.81	6.70
Rural	7.32	7.22	6.87	6.74
		Top 20%		
National	43.38	46.04	46.20	44.87
Urban	47.90	43.97	46.75	46.07
Rural	42.70	45.07	45.18	43.75

Table 1.6. Distribution of households according to income (*adapted from BBS 1995, p. 61*)

Type of households	No. of households	% of households	Total no. of members
	Bottom 20%		
National	4,070,416	20.05	14,025,311
Urban	190,816	6.98	625,136
Rural	3,879,600	22.08	25,400,175
	Top 20%		
National	198,391	0.97	2,140,733
Urban	84,016	3.07	736,208
Rural	114,375	0.65	1,404,525

In rural areas, the process of marginalisation of low-income communities is a continuing process, despite extensive investment in rural development by both the government and non-governmental organisations from the early 1980s onwards (Rahman 1994, p. 134). Figures for land and income distribution (Tables 1.4., 1.5. and 1.6.) suggest that this investment may not be benefiting the poor. Similarly, while a range of rural housing programmes have been initiated, the question of who they actually benefit, a basic concern of this research, has not been answered.

1.2.2. Expanding network of the NGO sector

With a low level of economic development, Bangladesh is dependent on international aid (Gunthorp 1998, p. 97; Haq 1997, p. 45; ITM 1997, p. 125). This dependency has further exacerbated the uneven distribution of resources; since the inception of Bangladesh in 1971, policies of the government and international aid agencies have generally been unable to improve conditions for the poor majority, instead benefiting a minority elite (Cassen 1994, p. 249-251; Sobhan 1982; The Hunger Project 1985, p. 238).

Due to such problems and also because large aid agencies, like governments in many developing countries, find it difficult to administer projects on a small scale involving local participation of underprivileged communities (Cassen 1994, p. 42), in recent years, many bilateral and multilateral aid bodies have begun to believe that aid is more effective in alleviating poverty when channelled through grassroots organisations (ActionAid 1988, pp. 3, 9, 24; Monan 1995, p. 45), popularly known as NGOs (non-governmental organisations). The growth of the NGO sector has been tremendous in the last two decades, with about 4,000 in developed countries and about 20,000 in developing countries (Slim 1997, p. 210); there were 848 registered NGOs in Bangladesh in 1997, many relatively new, a giant leap from only 45 NGOs in 1981 (ADAB 1996; Sobhan 1997, pp. 4-5). As established by Sobhan (1997, p. 4): 'the resources available to the [NGO] sector have increased exponentially, rising from approximately 6 per cent of total foreign aid disbursements in 1988-89 to an average of around 17 per cent over the last five years.' Estimates suggest that NGOs operate in nearly 80% of all Bangladeshi villages and cater to nearly 30% of the rural population (Sobhan 1997, p. 5). In this study, therefore, the investigation of actions of NGOs in housing provision for low-income rural communities constitutes a substantial aspect.

The rapid growth of NGOs can also be viewed as a facet of aid dependency, where these organisations avail themselves of the advantage of receiving funds through the newly formulated pattern of aid allocation (Cassen 1994, p. 138); NGOs in Bangladesh obtain 95% of their funds from external sources (Sobhan 1997, pp. 13-14). They thus face the fundamental problem of financial sustainablity because of their reliance on external aid, an intrinsic weakness of the NGO sector (Hashemi 1995, pp. 109-110; Karim 1995, p. 116). Revelant to this study, most rural low-income housing programmes in Bangladesh are also based on international funding and implemented by NGOs. This study explores certain aspects of utilisation of international aid appertaining to these programmes.

1.2.3. Natural hazards: a recurrent characteristic

Primarily because of its location, Bangladesh is prone to a variety of natural hazards. These are made more severe by poverty, and are inextricably linked to the climate, topography and nature of the region, exacerbated further by intensification of land use and human interference (Hughes *et al* 1994, pp. 20-21; Ives and Messerlie 1989, pp. 142-144). There are three main natural hazards in Bangladesh: floods, cyclones and riverbank erosion [for a detailed review of the various types of natural hazards in Bangladesh, see Pramanik (1994, pp. 134-181)].

Annual seasonal flooding is the norm, and settlements and agriculture of the region are well-adapted to it (Borton *et al* 1992, pp. 106-107; Brammer and Jones 1993, p. 393; Chisholm 1979, p. 15, 16, 33, 43-48; Monan 1995, pp. 38-39; Oakley 1987, p. 27; Rashid 1991, p. 456; Sultana 1993, p. 84). However, when the flooding is excessive it results in disastrous floods (Brammer 1992, pp. 110-111). There are institutional initiatives to deal with floods, such as the Flood Action Plan (FAP) (Adnan 1994, pp. 184-185; Boyce 1994, pp. 465-475; Brammer 1990b, pp. 158-162; Brammer and Jones 1993, p. 400), but it appears that the issue is much too complex for easy long-term remedy (Adnan 1994; Alam 1998; Blaikie *et al* 1994, pp. 138-143; Boyce 1994; Dalal-Clayton 1990; ECN 1992, p. 9; Hafiz and Islam 1993, p. 18; Hughes *et al* 1994; Sklar and Dulu 1994). To provide protection from cyclones, shelters have been built in most coastal areas (BRAC 1991; Caritas 1992; Helen Keller International/UNDP 1994, p. 6; Smith 1992, p. 198), but they are still few in number and often lack necessary amenities and maintenance (Brammer and Jones 1993, pp. 396, 404-405; Maddrell 1993, pp. 59-60, 63; BRAC 1991, pp. 9-11; Hall 1995, p. 17); nevertheless, the existing cyclone shelters have been able to minimise loss of human lives (BRAC 1991, pp. 1, 16, 20; Tear Times 1997, p. 21; Walsh 1994). Riverbank erosion is less well documented and has received less institutional attention than the other hazards (Haque and Zaman 1989, p. 300; Hossain 1993, p. 25; Nazem and Elahi 1990, p. 46). However, the severity of this form of disaster relates to the set-back it causes in the context of great demand and competition of land (Nazem and Elahi 1990, pp. 51-52). It is a serious problem in many parts of the floodplains and communities affected by riverbank erosion, usually a vulnerable and marginal section of the rural population, are often compelled to migrate or squat on nearby embankments (Brammer and Jones 1993, p. 395; Nazem and Elahi 1990, p. 55; Rahman 1993, pp. 11-13; Zaman 1989, pp. 199, 200, 201).

Recurrent natural disasters is an important factor in any study on rural housing in Bangladesh. Indeed, many low-income rural housing programmes were initiated as post-disaster rehabilitation projects. Hazards act as a serious impediment to the rural poor in building and sustaining housing. In this study it has been found important to investigate the performance of housing with regard to hazards and is a theme that permeates throughout.

1.3. HOUSING STRATEGIES FOR LOW-INCOME RURAL COMMUNITIES IN BANGLADESH

A variety of social and environmental conditions are causing change in the rural habitat, often rapid and presenting problems with which low-income communities find it difficult to cope. This study is concerned with such problems and attempts by agencies and communities to address them. It is now necessary to introduce some of the basic problems in general terms which are then dealt with in detail in subsequent chapters.

1.3.1. General nature of problems affecting housing of low-income rural communities

Various problems can be noted in rural settlements: recent patterns of land fragmentation, landlessness and compounded poverty often prevent many households from forming traditional homesteads or building a house adequately. These are not entirely new phenomena; historical accounts describe a similar disparity. In the past, records of travellers in the region during the 19th century tell us, a wealthy household consisted of several buildings, in some cases ten or so, while a poor household owned a single one (King 1984, pp. 18-20). A survey of rural housing in the early 1980s observed that many poor households did not own enough land to establish a typical homestead with built units around a courtyard; a house with a small front yard was the most they could own (Islam *et al* 1981, p. 14).

Nevertheless, the disparity between housing of poor and wealthy households has amplified over the recent past, similarly to agricultural land ownership, discussed above. Generally, in most localities wealthy farmers own considerably more substantial homestead land and houses than the majority of the rural populace (Sultana 1993, p. 72). An outcome of uneven land ownership is that poor households have consistently settled on marginal or hazardous land, or live in temporary dwellings on other people's land and 15-20% of the rural population do not own any homestaed land (Rahman 1993, pp. 1-2, 10-16; Rahman and Huq 1994, p. 4). The practice of renting houses had historically been, and to a large extent still is, virtually non-existent in rural areas (Islam 1996, pp. 382-383; Islam *et al* 1981, p. 6). Survey results indicate that more than 99% of rural housing is owner-occupied or rent-free (BBS 1993, p. XII). It can be argued that this customary pattern contributes to the minimal housing conditions of the poor, who have very little savings or ready lump-sum cash to invest in buying land and building materials, whereas they might have been able to afford a rented house, paying small sums of rent in regular instalments.

There is a widespread tendency in literature on rural housing in Bangladesh to tend to point out the lack of long-term durability of vernacular building materials as a principal problem (ASA 1990;

Barua 1999, pp. 88-89; HERC and HBRI undated, p. 1; Islam 1993, p. 2; Proshika 1994a, pp. 2-3; Sen 1995, pp. 107-110; LGED 1992, p. 19; LGED 1993, pp. 10-11). The main response by agencies to this perception has been to replace natural materials with manufactured durable type products (Barua 1999, pp. 88-89; BCL 1995; LGED 1993, pp. 2, 10-11). Some agencies advocate the continued use of natural materials by incorporating durability augmenting techniques, such as chemical treatment (Alam *undated*, pp. 3-5; Haque 1986, pp. 15-16; Proshika 1994a, pp. 4, 5, 7). There is, however, a need to investigate the validity of assumptions and the effectiveness of both these approaches, a prime concern of this research. A basic criticism of improvement in durability is the increased cost, which reduces the outreach of housing programmes (Borton *et al* 1992, pp. 102-103). As Khan (1985, p. 100) observed:

> Traditional construction is always relatively temporary; it needs to be repaired every year after the monsoons. But the cost is minimal; anything more permanent would cost eight or ten times as much.

Perhaps Khan's figures are too general, but the point remains. Improved durability is usually accompanied by substantial increase in cost. An agency response to this problem, seemingly overcoming it, has been to provide credit for house construction with durable components, exemplified by the GB housing programme (Barua 1999). Despite the number of recent critical reviews of the GB's operation (Blackstock 1999, p. 23; Goetz and Gupta 1996; Khondkar 1998; UBINIG/Rafi 1998), there is little literature or independent study of its housing credit programme, which therefore has been chosen as a case study in this research.

The other issue considered problematic is the small size of low-income rural housing (e.g. Islam 1993, pp. 1-2). To what extent this is new and arising from changing circumstances is not clear; in the absence of sufficient longitudinal data and historical records in this regard, it is not possible to ascertain accurately if the present size is consistent or not with that in former times, or rather, whether house size is a variable, dependent primarily on tradition or social and/or economic change. Recent available figures over a time span of nine years do indicate that from 1982 to 1991, there was a slight decrease in average floor space per person (5.7% in 1982, 5.0% in 1991) (BBS 1988, p. 57; BBS 1996, p. 152). However, in the absence of more robust data, it is inconclusive if this small reduction in size significantly reflects actual trends.

A core problem, a concern of various agencies and writers dealing with rural development, is lack of improved infrastructure for sanitation and water supply. Many sources point out the general lack or inadequacy of basic amenities such as clean drinking water, toilets and drainage (Hoque and Hoque 1994; Islam *et al* 1981, p. 5; Muktadir and Hasan 1985, p. 83; Sultana 1993, p. 89). Available reports indicate that in 1982 about 1.6% and about 53% of rural households had access to electricity and safe drinking water (tap or tubewell) respectively (Islam 1993, p. 6). More recent reports mention that 82% of the rural population now drink water from tubewells, built with extensive institutional intervention and provision (Hoque and Hoque 1994, p. 364). However, only 12% use tubewell water for all purposes such as washing utensils, bathing, etc, hence increased

access to tubewell has not ensured reduction of susceptibility to diarrhoel and water-borne diseases (Hoque and Hoque 1994, p. 364). A large section of the population depends on ponds, rivers and other similar water sources (Sultana 1993, pp. 77, 80), often not clean. The overall lack of education and shortage of fuel in many areas compels people to drink water without boiling it, contributing to disease. Similarly, many people defecate in fields and rivers, or in simple toilets without adequate drainage. Some sources relate such practices to the risk of disease and contamination (Hoque and Hoque 1994; Harrison 1980, pp. 232); this is easily conceivable in the present context of densification of settlements and intensified impact of natural disasters.

Several rural housing programmes provide tubewells and sanitary pit-latrines to their beneficiaries to solve these problems (Bangladesh Ministry of Land 1995, p. 14; Barua 1999, pp. 89, 91-92; EDM 1993; JBP 1994; RDF undated, p. 10). However, such programmes, combined with efforts of other rural development programmes, appears to have had minimal impact. In 1982, more than 98% of the rural population used toilets not classified as 'sanitary' or more improved (i.e. either makeshift or open) (BBS 1988, p. 64) and nine years later more than 84% utilised similar toilets (BBS 1996, p. 151) (Tables 1.7. and 1.8.); the transition to 'sanitary' modes was at the rate of about 1.5% per annum. It must be conceded that in absolute numbers in a context of a large population, the increase is large and does represent earnest institutional effort. However, the increase is par with the annual rural population growth rate of 1.5% (Islam 1993, p. 3); hence the same gap persists between supply and need.

Table 1.7. Percentage of households according to system of toilet and residence, 1982 (*BBS 1988, p. 64*)

Residence	*Total*	*Flush toilet (municipal sewerage)*	*Flush toilet (septic tank)*	*Municipal sewerage latrine*	*Sanitary*	*Temporary arrangement*	*None (open field/ bush)*
Bangladesh	100.00	0.52	1.04	1.04	3.55	44.94	48.91
Urban	100.00	3.64	7.66	8.11	21.05	46.35	13.20
Rural	100.00	0.11	0.17	0.11	1.25	44.76	53.60

Table 1.8. Percentage of households according to system of toilet and residence, 1991 (*BBS 1997, p. 151*)

Residence	*Total*	*Flush toilet and septic tank*	*Water sealed toilet*	*Municipal toilet*	*Other (covered)*	*Other (open)*
Bangladesh	100.00	6.85	12.83	0.92	42.56	36.85
Urban	100.00	35.40	20.82	4.37	26.07	13.35
Rural	100.00	3.44	11.87	0.51	44.53	39.66

In addition, social factors such as reluctance to use improved facilities seem to hinder institutional effort. An earlier documentation of such factors is provided by Harrison (1980, p. 233): despite the extensive provision of 'safe' water wells by UNICEF in the late 1970s, most people continued to use ponds and rivers for daily washing and bathing. The researcher had been involved in a project for rooftop rainwater collection and storage in hilly and coastal areas where there are limited freshwater sources. However, there were reports that households had begun to use the concrete

tanks for rearing fish instead of storing clean water. Although such projects might not be intrinsically flawed, they tend to be carried out in isolation without inclusion of wider considerations such as education and awareness-creation of the benefits of sanitation and clean water.

In this study, the extent to which two aspects are evident in housing - the gap between need and supply, and mismatch in agency and community aspirations - is investigated. Inferring from the attempts at general improvement of rural settlement infrastructure, these aspects appear important.

1.3.2. Recent agency-based rural housing programmes

Because this study is concerned with the position of low-income rural communities in the context of an expanding framework of agency action, it was decided to select case studies of agency-supported projects, then studying households that had benefited directly and also other households in the vicinity of the projects. The basis of selection of case studies of agency projects is presented below.

In 1990, the government of Bangladesh arranged a national rural housing exhibition and seminar (RDCD *et al* 1990). After the major floods of 1987 and 1988, it was found that several NGO-operated rural housing projects had been implemented, concurrently with programmes of other agencies that attempted to improve housing for low-income communities. The exhibition/seminar was intended for raising public interest in and awareness of these efforts, as well as attract funding from international organisations for rural housing programmes. Most of the agencies involved were local; although supported by external funds, this nevertheless represented a change from the predominantly externally-driven projects of the 1970s. It appears that local capacity for programme management and project implementation for housing had developed since then, perhaps consistent with the general development of the NGO sector over his period.

In any case, one fact was certain: the 1987/1988 floods mainly, but also other disasters, spurred on many agencies to implement rural housing projects for post-disaster rehabilitation/ reconstruction. In Bangladesh, in the past and more recently, rural housing programmes have principally been implemented as a response to natural disasters; the link between these programmes and disasters is inextricable. One cannot but speculate whether such efforts would have emerged had there not been disasters: would a general need for improvement of low-income rural housing been sufficient impetus for agencies and international funders to become involved in this essentially commodity-based, non-productive (in a direct sense) development sector, requiring higher investment than in other sectors of community development?

The 1990 exhibition/seminar provided an introduction to and list of some of the main recent rural housing programmes, useful for selecting case studies for this research. Programmes of the Grameen Bank (GB) and the Ministry of Land's Adarsha Gram (AG) (former Operation Thikana/ Cluster Village Programme) were selected because they were substantial, both in terms of

outreach and their attempt to address long-term development, not only post-disaster rehabilitation. The GB initiated its rural housing programme after the 1987 floods, but has continued it as part of its wider development efforts.

As examples of large and prominant NGOs, Proshika and the Association of Social Advancement (ASA) programmes were also selected as case studies. The post-tornado rehabilitation projects of Enfants du Monde (EDM) and post-flood projects of the World Vision of Bangladesh (WVB) were also chosen because of their use of innovative non-traditional construction, such as metal posts and framing. Some of the WVB projects were implemented in collaboration with the government's AG programme, hence these projects represent an example of partnership, well worth reviewing. The effects of the welfarist approach was investigated through choice of the projects of Caritas and Concern, typical cases of organisations driven by religious/ philanthropic/ charitable ideology. Concern was later dropped from this study because its programme's contents were similar to those of other case studies thus contributing to the need for time-effective fieldwork.

Because the programmes of the Bangladesh Rural Advancement Committee (BRAC) and Gono-Shasthya Kendra (GSK) provided only housing loans (also see Kar and Chowdhury 1991), they were not selected as case studies. Although both of these, especially BRAC, are large NGOs, their development efforts are concentrated in other sectors. It must be conceded that after fieldwork and during analysis of its results, it emerged that consideration of these programmes might have provided additional depth to this research. Nevertheless, it was possible to study the utilisation of loans not tied to a stipulated use of house design/construction through other examples. Most of the other programmes in the exhibition/seminar were limited in scope and generally similar in essence to the above programmes; therefore to maintain manageability in this research they were not considered.

In 1995, a Rural Housing Forum was formed in Bangladesh (Daily Star 1995). This provided a new list of agencies and several of the above programmes were included in it. However, a number of newer small organisations had emerged, which on later investigation were found to be associated with project implementation in partnership with the Local Government Engineering Department (LGED). This became evident in 1996 from a presentation by LGED staff members (Islam 1999) at the Housing & Hazards international workshop in Dhaka; it was found that LGED was working in partnership with a range of NGOs implementing projects in various rural areas. This workshop also coincided with the exploratory-reconnaissance study of this research and it provided the opportunity to identify some of the projects that could feasibly be studied in depth during fieldwork. Jatiya Bandhujan Parishad (JBP), Employment and Technology Development Association (ETDA) and a project executed principally by LGED in Chittagong were also selected as case studies; although the latter was in an urban area, it had many rural characteristics.

During the exploratory-reconnaissance study, the researcher was also interested in identifying agencies that utilised innovative construction and materials. Micro-concrete roofing (MCR) tile is a product widely applied in the developing world, also belonging to the 'Appropriate'/ 'Intermediate Technology' paradigm similar to stabilised earth blocks. Although some of the agencies mentioned had applied other types of innovative construction, except for EDM, none had used MCR tile in their housing projects. Proshika only used it in its non-residential projects, such as schools. However, in consultation with the local supplier of MCR tile, the NGO Rural Development Foundation (RDF) was identified as utilising MCR tile, and therefore was chosen as a case study. The researcher knew from previous experience the work of the Christian Commission for Development in Bangladesh (CCDB) in building 'mini community-flood-shelters' on raised on stilts; although not strictly housing, these shelters were used as houses, and because of the innovative concept, it was decided to investigate them.

In total, projects of twelve agency programmes were selected. These contained a diversity of approaches, but nonetheless all had the common aim of improving housing conditions for low-income rural communities. It is believed that this selection adequately represents the variety of agency-supported housing strategies for low income rural communities in Bangladesh.

1.4. CONCLUSIONS

In this chapter, reasoning is provided for the importance of studying rural housing. Predominantly rural Bangladesh, an example of a very poor developing country, is a germane country case study for research on low-income rural housing. Multitudinous worlds exist within the microcosm of the world of the country case study in the form of case studies of rural housing. These worlds interact, overlap and work upon each other to lend meaning to the country case study. Therefore such a case study can provide an enriching and bountiful sphere for research, as was experienced in the course of this study.

An anecdote bears brief mention here. During the early stage of this study, the researcher was confronted by an expression of incredulity from an associate: 'These are such simple houses, what research can you do on them? Your research must be very simple!' As research progressed, the researcher experienced firsthand how erroneous this assumption was. The houses studied are perhaps simple (a relative matter nevertheless), but it began to be realised that the research was not only about houses, but also about people and relationships. Within the world of the Bangladeshi rural context, a complex network of human relationships manifested themselves in the realm of low-income rural housing.

Because of this complexity and the rich web of human interaction which constructs apparently 'simple' living environments, a rigorous research approach had to be followed and an extended period of time had to be invested in understanding this complexity. Without a structured research approach, this study may have run into serious impediments. This approach is followed in the succeeding chapters.

• *CHAPTER 2*

CONTEXT OF RURAL HOUSING

2.1. INTRODUCTION

In the previous chapter, introducing the basis of this study and the general setting of Bangladesh provides the background for the focus in this chapter on the specific context of rural housing in Bangladesh. To do so, it is necessary to firstly relate to the wider global context, drawing attention in general terms to some of the obstacles low-income communities throughout the developing world face in building adequate housing. This list of impediments is not exhaustive, and although general, it pertains especially to Bangladeshi low-income rural communities. The discussion is then narrowed down to describe salient characteristics of rural housing in Bangladesh to serve as a background for later chapters.

2.2. IMPEDIMENTS TO LOW-INCOME COMMUNITIES IN BUILDING ADEQUATE HOUSING

The problems facing low-income communities in building shelter are often formidable and intractable, deeply linked to political and economic order, as well as to social structure. In this section, the broad setting of low-income housing is outlined, drawing attention to some of the obstacles low-income communities in the developing world face in building adequate housing. The list is not exhaustive, but points to some of the issues relevant to this study.

2.2.1. Financial resource constraints

Low-income communities lack financial resources, the obvious reason why their income is considered 'low'. This lack, and also the unavailability of mechanisms conducive to them for improving their livelihood, serve to form one of the basic constraints on building adequate housing. As Mitchell and Bevan (1992) have argued persuasively, the importance of financial resources for housing has become pronounced throughout the developing world as a consequence of the expansion of the cash economy. Although these authors have presented their case primarily with regard to the urban context (pp. 53-54), it can be asserted that the permeation of the cash economy is increasingly all-pervading: urban and rural economies are linked in one single monetary system of subversion of previous traditional modalities of exchange.

A typical manifestation of financial resource constraints on low-income communities, affecting their ability to secure adequate housing, is their lack of land ownership or security of land tenure. This is an endemic problem in many urban low-income informal settlements, widely documented and discussed in development planning literature. It is not attempted to review this literature in depth here as it is not directly relevant to the concerns of this research. Although threat of eviction and homelessness are generally associated with urban areas, there is also evidence that traditional usufructury land rights in many rural areas have become curtailed. Schumann (*undated*, pp. 9, 15)

has pointed out the prevalence of state ownership of land in Sudan where traditional usufructury land rights previously prevailed. The privatisation of common property land (and consequent restriction of resource utilisation such as natural building materials) in many parts of India is well-documented (Ghosh and Bharadwaj 1992, p. 147; Wells *et al* 1994, p. 35). Land is an important means of production and income in rural agrarian contexts, but about 25% of low-income rural populations in the developing world are landless or have insecure tenure (UNDP 1997, p. 62). Regions with high population density, such as Bangladesh, are often characterised by intense competition for land and complexity of land ownership; usually the poorer section of the population become the loser in land rights conflicts (Hartmann and Boyce 1983, pp. 194-213; Jansen 1986).

Because of the importance of land as a financial resource, there are diverse approaches and attempts to increase the access of low-income communities to it. Ranging from national land reform policies (Crow 1992, pp. 259-262; Ghosh and Bharadwaj 1992, pp. 158-159; Siddiqui 1994, pp. 28-29) to quasi-radical but unorganised peoples movements such as the Bhoomi Sena in India (Rahman 1993, pp. 34-35) to organised 'participatory' mobilising of the landless such as Nijera Kori in Bangladesh [Christian Aid *undated* (a); Harland 1991, pp. 119-124; Hye 1996, pp. 190-192], or resistance to evictions in Bangkok (Seabrook 1996, pp. 252-257) to national campaigns for housing rights (Sen 1996, pp. 20-22), the list is seemingly endless.

Despite this diversity of attempts, the problem of land often continues to present a formidable obstacle to housing for low-income households. This study does not attempt to deal in great detail with the issue of land, except in relation to housing. Because of its broader importance in delineating the context of housing of low-income communities and its importance as a financial resource, it has been outlined here.

Institutional intervention intended for poverty alleviation to increase opportunity for access to resources (such as land and housing) linked to the cash economy can be classified into two main types. One pertains to the typical philanthropic charitable mode, somewhat akin to a welfarist approach. A range of religious organisations operate within this mode. Here the appeal is made purely on moral grounds of goodwill and benevolence, based on the ideology of helping fellow 'human beings' as a fulfilment of religious duty. Assistance to the poor by such agencies is generally in the form of unconditional grants. Typically, housing provided through this approach tends to be in a post-disaster or emergency rehabilitation project. The welfarist approach, especially with regard to government policy, has been subjected to criticism from various quarters, especially the neo-liberal camp, decrying it as 'wasteful, inefficient and inequitable' (*op cit*), breeding dependency and impairing local autonomy (Mackintosh 1992, pp. 7, 63). Partly because of this criticism and as a consequence of the ascendency of neo-liberal concepts in development discourse, many religious charitable organisations now also espouse credit schemes [for example, see Christian Aid *undated* (b)].

The paradigm of credit, the other intervention mode, is associated with neo-liberal economic strategies promoted widely by prominent financial organisations such as the World Bank and the International Monetary Fund (IMF). Succinctly summarised by Bernstein (1992, p. 24):

> ... this typically means integrating them [the poor] more deeply into markets and devoting more of their resources and energies to producing goods for sale (commodity production). This was the conception, for example, of the World Bank's strategy for 'reaching the poorest' through rural development programmes ...

A variety of projects based on cost-recovery models have been implemented throughout the developing world with the expectation that the poor would manage to generate capital resources to pay for their own development through engagement in commercial activities. Some examples in the field of low-income housing appertaining to this neo-liberal paradigm can be cited. Schemes in Africa, such as the Tema Housing Co-operative in Ghana (Mitchell and Bevan 1992, pp. 57-60) and the Gikomba Housing Society in Kenya (Agevi 1997, pp. 8-9), consist of co-operatives that have been established to gain access to credit from the formal sector, where low-income members of the co-operative are responsible for repayment. However, these are examples from urban areas and financial credit for low-income rural housing is hardly discussed in literature and examples are not well-known. One example is the Grameen Bank (GB) in Bangladesh, widely publicised for its extension of credit to low-income villagers (although its housing loan programme is less widely discussed) and studied in this research.

It seems that a moral appeal is woven into these attempts to integrate the poor into the competitive cash economy and encourage among them small commodity capitalism, in line with the expansion of globalised 'free market' ethics; the appeal is based on *inclusion* of those who were previously *excluded* from the process of 'development', as understood by the proponents of neo-liberal economic policies. Critics of this modality, such as A.K. Sen, have labelled it the 'moral standing of the market' (quoted in Mackintosh 1992, p. 7). This 'moral standing', founded on the appeal of inclusion of the poor into the market via credit programmes, is usually applied to target groups because of programme and budget limitations; with wider coverage and replication as strong goals, programmes begin to be spread thinly over a large region. The example of the GB, with its extensive national coverage but inability to eradicate poverty from a single village, can be cited (Rahman 1995, p. 28). The result perhaps is that some groups within the community tend to benefit while others do not, introducing disharmony and covetousness within the community. Thus the moral standing of neo-liberal policy is weak in its claims of inclusion; it appears that the oft-traversed path of the paradox of *inclusion* of some at the expense of *exclusion* of others is the norm. These issues are explored in this study utilising primary information from field studies of housing credit programmes such as the GB's.

2.2.2. Hazard vulnerability

It has become widely accepted that low-income communities are generally more vulnerable to natural and man-made hazards than wealthier ones (Brazier 1991, pp. 4-6; Davis 1999, p. 65; Hall

1995, p. 16; Jackson 1990, pp. 38-40; Rahman and Huq 1994, pp. 30-31; Smith 1992, pp. 19, 30-34; Timberlake 1987, p. 20-21). The oft-quoted expression in disaster studies discourse - Hazard + Vulnerability = Disaster - relates to this position of low-income communities. Among a variety of factors, demographic change, increasing poverty and competition for resources, especially of land, have aggravated their vulnerability. It is correct to point out that 'Poor countries are much more prone to disasters than rich ones' (*op cit*) (New Internationalist 1991, p. 17), but it is also important to note that within 'poor countries' the poor are usually the direct victims of disasters simply because of their marginalisation, whilst the affluent are relatively secure. The list can be lengthy, but some typical examples are: squatter communities on steep hillsides in Guatemala (Brazier 1991, p. 4), low-income communities in deteriorating inner-city tenements in Mexico City (UNCHS 1989, p. 20-21) and marginalised communities in cyclone-prone offshore islands in Bangladesh (Mahmud 1991, p. 10; Rahman and Huq 1994, pp. 30-31). Even within affluent countries, low-income communities face greater exposure to hazards, a less publicised fact, but nevertheless pointing to the link between vulnerability and income. Some examples cited in literature are poor communities residing close to hazardous waste disposal sites in the USA (Smith 1992, p. 32) and aboriginal communities in Australia living in sub-standard housing on low-lying land without access to television channels which broadcast flood warnings (Brazier 1991, p. 5).

Despite the link between underdevelopment and disasters, a very small proportion of development assistance at the state level, in the form of bilateral or multilateral aid, is allocated to long-term reduction of vulnerability of low-income communities in the developing world. For example, as pointed out by Jackson (1990, p. 127), in the UK's bilateral aid to India in 1980-88 there was no mention of allocation for disaster mitigation or preparedness; an overwhelming proportion, more than 75%, was allocated to infrastructure and technical development, while in contrast only 8% was provided for social development such as housing and education. Or, although not directly linked but nevertheless demonstrating priority in bilateral aid, in 1985 more than 30% of USA aid was alloted to Israel and Egypt to maintain strategic interests in that region (Timberlake 1987, p. 17) while in the same year more than 140500 human lives were lost in natural and man-made disasters worldwide, all in the developing world (New Internationalist 1991, p. 16). It appears that the main response to disasters by bilateral funding bodies has been high profile post-disaster relief, not a more concerted effort to marry long-term development with vulnerability reduction. An example of this is evident from a readily available attractive booklet published by the official bilateral body in the UK, the former ODA (Overseas Development Administration), which flourishes that £11.5 million was granted as relief after the 1991 cyclone in Bangladesh (ODA 1993, p. 24). Such high profile aid lends well to presentation in self-serving glossy literature to promote a somewhat deceptive sense of accomplishment, perhaps satisfying well-meaning but naive taxpayers in the developed world, but of minimal significance for low-income communities.

On the other hand, 'Northern' NGOs (or 'voluntary organisations' or 'charities', as they are known in the UK) allocate a significant proportion of their budgets to emergency relief and disaster prevention. For example, Oxfam, one of the largest and well-known NGOs in the UK, utilised

about 53% of its overseas spending for such purposes in 1996-97 and 1997-98 (Oxfam 1997; Oxfam 1998, p. 31). In a smaller NGO, ITDG, the largest proportion of expenditure (15%) in 1995-96 was in policy and disaster mitigation (ITDG 1996a, p. 23). This trend among NGOs suggests two points. Firstly, because NGOs tend to work predominantly with communities, compared to multilateral and bilateral bodies that principally work with governments, there is perhaps the belief that NGOs have a better understanding of vulnerability, leading to corresponding prioritisation of fund allocation. Secondly, because of the community-based orientation of NGOs, bilateral bodies channel funds through them for sectors such as disasters and community development that the model of state-level aid finds difficult to attend to directly.

Notwithstanding efforts by various agencies, especially those belonging to the NGO sector, there is a 6% annual increase in the number of people affected by disasters (Davis 1999, p. 65). Perhaps this is an indication that the efforts have not had a widespread impact, or that they have principally focused on post-disaster relief and rehabilitation instead of hazard mitigation and preparedness. Nonetheless, regional differences in the nature of hazards, their unpredictability, scale of impact and linkage with social structure are some of the factors that make it a highly challenging as well as demanding field for agencies. Despite the difficulties faced by the NGO sector, essentially because of its orientation towards local level action, in bringing about substantial change to the structural or root-cause of disasters - poverty - there are some examples of successful approaches, at least in minimising risk and improving resistance of housing to hazards. Aysan *et al* (1995, pp. 59-159) have catalogued case studies from different parts of the world where agencies managed to carry out effective improvements to housing by incorporating safe building techniques. The case studies were submitted for printing mainly by contributors involved in the projects, but the publication points out, objectively, shortcomings in some of the cases and problems experienced by implementing agencies. On the other hand, many organisations publish promotional literature that tends to overemphasise the merits of their programmes. An example is a publication by the United Nations Centre for Human Settlements (UNCHS 1989), cataloguing supposedly successful cases and approaches somewhat similarly to the publication cited above, but, in contrast, consists of programmes supported by UNCHS. On the basis of research done for this study, some of the assertions of the UNCHS-supported flood-rehabilitation programme in Bangladesh carried out after the 1988 floods, mentioned in the publication (pp. 5-7), can be seriously questioned. There is thus a need for caution in accepting accounts of effective approaches cited in such literature.

The above observations suggest that despite various efforts there is still a large shortfall in reduction of vulnerability and a large proportion of low-income communities worldwide continue to exist in exposure to hazards. In more hazardous or disaster-prone regions this assumes large dimensions, serving as a serious impediment to low-income communities for building adequate housing. In Bangladesh, many agency-based housing projects were implemented in response to disasters, primarily as post-disaster rehabilitation programmes; some of these projects are studied in this research. Post-disaster/emergency situations presents difficult challenges to implementation of house construction, a reason in this study for linking these two aspects.

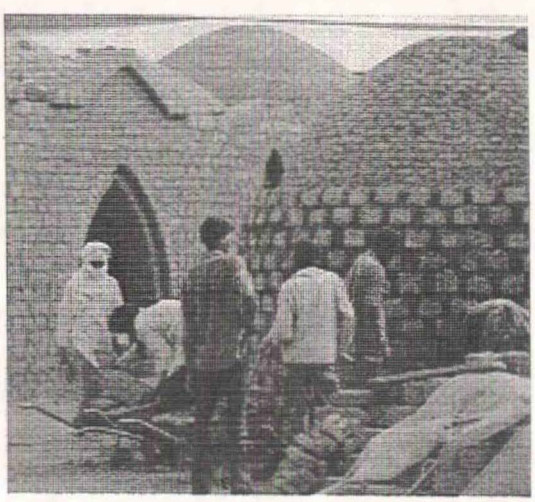
2.2.3. Natural resource constraints

Typically, low-income communities by necessity tend to utilise natural materials for house construction, because they offer a cost advantage over manufactured materials. For example, Schumann (*undated*, p. 32) has documented that, in the Sudan, construction with manufactured materials costs on average 50% more than traditional construction with earth and timber. Background experience pertaining to this research indicates that in Bangladesh a brick and cement house may cost more than ten times a house of similar size built of thatching grass and rushes. Recurrent maintenance expenditure may sometimes prove to be higher over the long term in houses built of natural materials, but without capital and/or adequate disposable income and easy access to funding sources, higher initial investment in construction with manufactured materials is generally prohibitive for most low-income households. These observations are in general terms; Wells *et al* (1994, p. 12) have cited examples in some urban areas where such a cost advantage is minimal. Nevertheless, that study acknowledged that construction with natural materials was generally more advantageous, because of other factors such as labour and material supply arrangements.

Undermining this cost advantage, however, natural building resources, specifically organic materials, have increasingly become subject to pressure and evidence of intensifying scarcity in a number of countries has been extensively documented by Wells *et al* (1994), a seminal study on this topic. This has been accompanied by their sharp increase in price. As pointed out in the study by Wells *et al* (1994, pp. 48-52), a twofold effect, according to income, is evident. Firstly, because of the decreasing cost differential between natural and manufactured materials, households that can afford it opt for construction with manufactured materials. The extensive use of such materials has often been associated with detrimental effects such as household indebtedness, embodied cost of production and transport, poor physical performance and pressure on national foreign currency reserves. Secondly, for very poor households, the option is utilisation of poor quality materials, hitherto not used for building, resulting in greater demand on household resources for maintenance.

This scarcity, inadvertently influencing the action of agencies dealing with low-income housing, has resulted in the search for solutions somewhere between the extremes of the responses of households with divergent economic profiles. The work of the Intermediate Technology Development Group (ITDG), as the name suggests, is a notable example of this paradigm (see for example, ITDGb 1996; Spence 1981). The typical remedial approach by agencies to the problem of declining resources, corresponding loosely to the 'intermediate' paradigm, is to substitute some organic building

Fig. 2.1. 'Woodless' construction in the Sahel *(Beazley 1993, p. 13)*



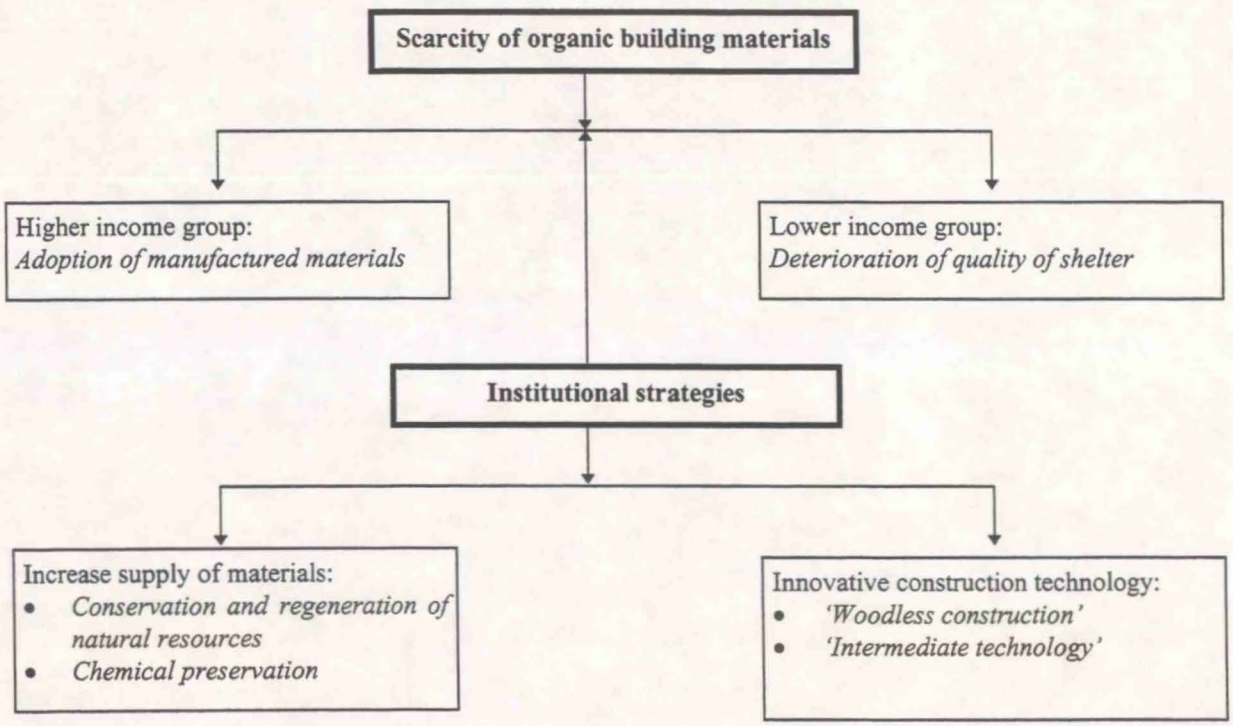
materials with innovative construction technologies utilising manufactured products. Manufactured materials in small amounts or used in innovative ways, especially in weak parts of a building or those suffering from the scarcity of natural materials, often resulting in improved performance, are conceived as solutions to overcome problems of short supply of natural materials. Projects of the Development Workshop (DW) in West Africa constitute an example in this regard (Norton 1996, pp. 19-20; Norton 1993, pp. 34-35). The application of compressive earth brick masonry roof structures instead of timber structural support, or 'woodless construction', in an arid region with severe shortage of timber, was envisioned as an appropriate response to contextual constraints. Although it appears that the technique has been assimilated, this required a sustained effort over nearly twelve years, pointing to the persistence and role of the agency (DW). This is very often not the case with externally derived intervention, shedding doubt on the generalisability of results of the DW's work. Another example in this regard is use of RC (reinforced concrete) posts, promoted by agencies such as the Grameen Bank in Bangladesh as an alternative to bamboo posts because of increasing scarcity of bamboo and recurrent expenditure on maintenance. This innovation is examined in detail in Chapter 6, Section 6.4.1.1.

The other institutional response to depletion of the biomass resource base has been widespread support for reforestation programmes. The literature on this topic is much too extensive to review here, but the involvement of large international organisations such as the United Nations [predominantly the United Nations Environment Programme (UNEP), the World Conservation Union (IUCN) and World Wildlife Fund (WWF)] can be cited as indications of this paradigm (see Beazley 1993). In the field of building materials, the initiative to expand the supply base and thereby reduce pressure on existing resources includes experiments on increasing the service life of organic materials, for example by treating them to resist decay. Although there are many institutional efforts at nature conservation and afforestation, in the field of building materials such initiatives generally appear to be limited. For example, several Bangladeshi NGOs have carried out extensive tree planting schemes in rural areas, well-managed and sustained by local communities, in the effort to establish 'social forestry' [Caritas *undated*; Christian Aid *undated* (c); Huq and Khan 1994, pp. 91-92; Hye 1996, p. 188-189; Karim 1995, p. 115; Rahman and Huq 1994, p. 31]. One of these programmes, that of Proshika, a large and well-known NGO, has been lauded for its effective support for community-based tree-plantation and management. Proshika also has a programme of supporting rural entrepreneurs in producing chemically treated bamboo mats to address the supply constraint on bamboo. However, there has been no attempt to link these two initiatives, and little evidence of attempts to grow organic building materials as part of these initiatives. A remedial approach to this situation, as suggested by Farrelly (1996, p. 307), is a systematic combined effort towards afforestation, production of building materials (such as bamboo) and improvement of their durability that could be woven into the rural economy and ecology to overcome a range of problems. Since there are hardly any such examples of agency-supported production of organic building products in the developing world within the wider agenda of redressing deforestation, advantages of this approach and problems that may arise are

not known. Nevertheless, the approach might be potentially worthwhile, if applied in consultation with local communities, and it might perhaps be worth exploring at least on a pilot project scale.

Fig. 2.2. represents diagrammatically household and institutional response paradigms to the exigent situation of diminishing organic resources. A core concern of this study is this interface between household and institutional actions, to gain an understanding of agency efforts in addressing problems in building materials supply faced by low-income communities.

Fig. 2.2. Main household responses and institutional remedial approaches to the depletion of organic resources



2.3. RURAL HOUSING PATTERNS

There is a general hierarchical pattern within rural settlements in Bangladesh. It begins with a *gram* (village) usually established on raised land, composed of a number of *paras* (neighbourhoods or hamlets). Each *para* consists of a number of *baris* (homesteads), which in turn are comprised of several *ghors* (dwelling units of individual households within an extended family) and ancillary buildings (Carter 1997, p. 13; Glassie 1997, p. 460). This section unfolds according to this hierarchy. It first outlines rural settlement patterns in Bangladesh, then narrows down to descriptions of typical homesteads within rural settlements. Then, in sequence, the individual dwelling units within homesteads are described.

2.3.1. Aspects of rural settlements

Most rural settlements in Bangladesh can be characterised as 'natural', in contrast to 'planned' settlements: that is, they have developed without any professional planning input (Sultana 1993, pp. 60, 117, 121). There are two main types of settlement documented: amorphous and elongated-

linear (Sultana 1993, p. 62). The amorphous type, consisting of clustered or scattered settlements on high land, is often dispersed throughout the terrain. The elongated-linear type is built on high land along natural levees of rivers or water channels. However, even within and in proximity to linear settlements, there is dispersion which depends on the surrounding level of land (Rashid 1991, p. 450).

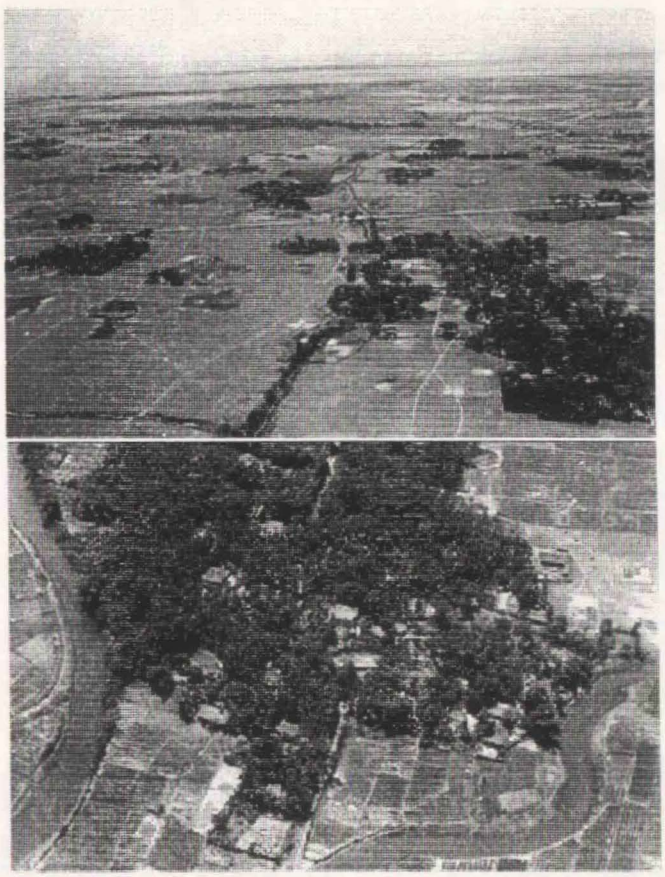
Where high land is not available, earth from the excavation of channels or ponds is piled into a mound on which a homestead is established, a pattern documented widely (Ahmed 1994, pp. 6-8; Ahmed 1997, p. 921; Carter 1997, p. 13; Glassie 1997, p. 13; Haq 1994, p. 64-65; Hasan 1985, pp. 33-35; Sultana 1993, p. 72). Over time more earth is added to extend the mound and in this way the settlement gradually expands. In many places, settlements thus established on raised mounds are scattered throughout the low-lying terrain, and during the rainy season virtually become islands (Chisholm 1979, pp. 8, 9; Rashid 1991, pp. 368, 450). The dispersion allows privacy and security for individual homesteads (Muktadir and Hasan 1985, p. 82), as in general, households related by kin settle on each mound and form homesteads.

There are variations on this general pattern. For example, in hilly and also in some marshy areas there are settlements built on stilts (Ahmed 1994, pp. 31, 33, 48, 49; Sultana 1993, p. 86). In parts of the hilly areas of Chittagong and marshy areas of Sylhet, settlements are fully nucleated, uncommon in most other rural areas. In some other areas, such as the Moribund Delta in the west and the Barind Tract in the Terrace Land to the north of Dhaka, nucleation is also evident to a lesser extent, that is, there is semi-nucleation, and the settlements are scattered, but with large clusters of homesteads within them (Chisholm 1979, p. 8; Rashid 1991, p. 452). In relatively dry areas, settlements tend to be less dispersed and more dense.

The general pattern of dispersed settlements creates problems of access and extension of infrastructure, especially that much of the land becomes submerged by water seasonally; often the main mode of transport is on water. It is difficult to build a transport network connected by land, or to provide services. Only older settlements in stable areas of the floodplains have grown to a sufficiently substantial size to allow an internal network of infrastructure. Where settlements have been built on *chors* (accreted alluvial land), access is unavoidably by boat; there is hardly any infrastructure within the *chors* or physical connections to other areas (Zaman 1989, p. 199). In general, although rural roads are gradually being built, the transport network in rural areas is minimal; some main highways link urban centres, to which villages are connected by unpaved feeder roads (Sultana 1993, pp. 102, 104).

A new settlement pattern has developed with the construction of flood-protection river embankments (which also often serve as roads): elongated-linear settlements are established there by landless squatter populations (Brammer and Jones 1993, p. 398; Hughes *et al* 1994, p. 27; Mandal 1994, p. 65; Thompson and Sultana 1996, pp. 10-11), especially after riverbank erosion and consequent loss of property. For example, the 240 km long embankment along the

Brahmaputra river in a particularly riverbank erosion-prone region has been settled by more than 100,000 landless and homeless people (Sklar and Dulu 1994, p. 389). Embankments are classified as government (*khaas*) land, and these settlements have uncertain legal status and suffer greatly from lack of security of tenure, and often also from the danger of embankment breaches caused by river erosion (Hughes *et al* 1994, p. 27, 29; Rahman 1993, pp. 24-28; Zaman 1989, p. 201). Because of the challenge this form of settlement presents both to agencies and embankment-settlers themselves, it has been studied during empirical investigation for this study, in addition to more general types of settlements.



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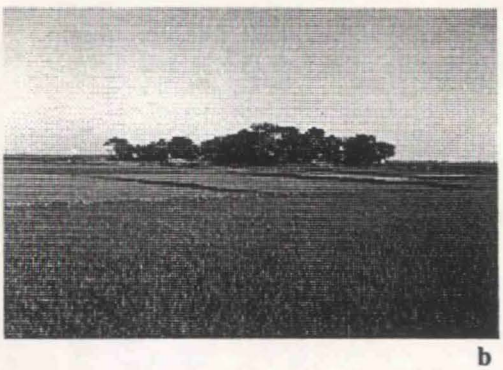

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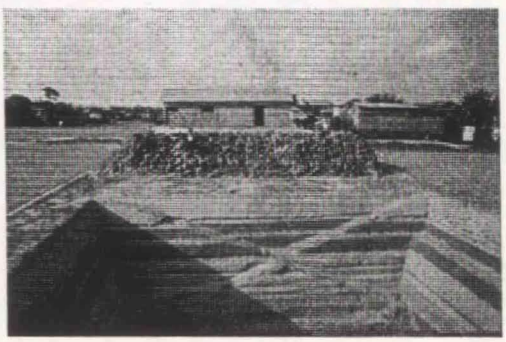

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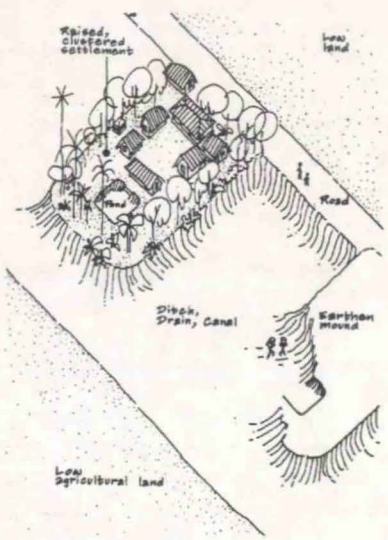


d

Fig. 2.3. Typical settlement pattern in the Bangladeshi floodplains

a Amorphous clustered settlements dispersed in the terrain *(photos: Tami Sugihara)*

b Settlement on a raised earthen mound

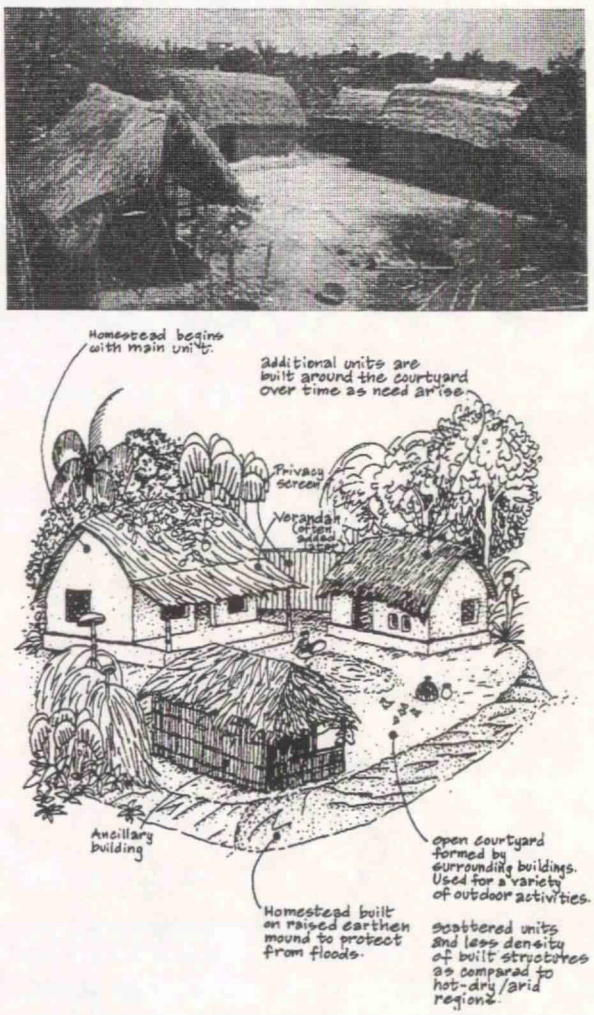
c & d Process of establishing a homestead on a raised earthen mound *(photo: D M Hasan; Ahmed 1994, p. 7)*

2.3.2. General features of homestead and house

The typical unit within settlements in the predominantly agricultural rural communities is the homestead, consisting of a group of buildings belonging to an extended family. A typical feature, widely documented, is that of the arrangement of buildings around a rectangular open courtyard (Ahmed 1994, pp. 9, 43; Ahmed 1997, p. 924; Carter 1997, p. 13; Chowdhury 1992, p. 27; Glassie 1997, pp. 13-14; Haq 1994, p. 65; Hasan 1985, pp. 28-29; Muktadir and Hasan 1985, p. 83; Rahman 1996, pp. 2, 9). The prevalence of the courtyard can be attibuted to its being a regional typology and multi-purpose space, relating well to local patterns of outdoor activity.

Each homestead begins with a main dwelling unit and ancillary structures, such as kitchens (Ahmed 1997, pp. 441-442), granaries and cow-sheds (Ahmed 1997, p. 706). The main dwelling, which is the sleeping unit, is of primary importance (Rashid 1991, p. 452). The ancillary structures tend to be semi-permanent and are constructed of perishable materials (Ahmed 1994, pp. 105-106; Rashid 1991, p. 457; Sultana 1993, p. 72). As the family grows, these are moved to peripheral locations and more dwelling units are added around the courtyard (Ahmed 1997, p. 706). Except for small additions, extension of a homestead is not accomplished by extending the dwelling units; rather, new buildings are built around the courtyard as need arises (Chowdhury 1992, pp. 28-29). Thus, a rural homestead usually consists of several small buildings constructed consecutively.

Fig. 2.4. Salient features of a Bangladeshi rural homestead *(photo: DM Hasan)*



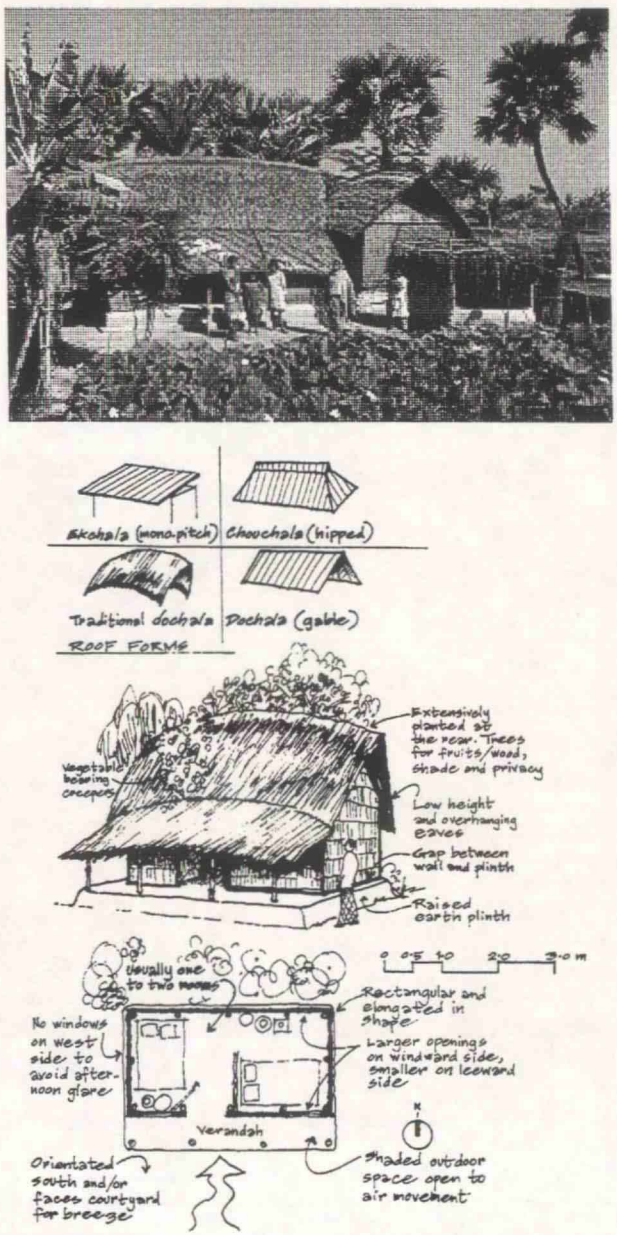
There are additional homestead features. A backyard pond is a characteristic of many large homesteads. Trees are planted along the outer boundary of the homestead site to provide shade and to serve as a source of fruit and timber. Such features of traditional rural housing in Bangladesh are documented in detail in several sources (Ahmed 1997; Ahmed 1994; Chisholm 1979; Haq 1994; Hasan 1985; Hasan 1987; Muktadir and Hasan 1985; Rashid 1991; Sultana 1993).

Each building within the homestead is generally rectangular in shape and customarily single-storied, though occasionally double-storied. The dwellings usually consist of a single room, but may vary with up to three rooms. Often in agricultural communities, dwellings also serve for the additional purpose of grain storage. Much time is spent outdoors, and the dwellings serve mainly

as a shelter in rainy weather and for sleeping. The main dwelling unit, usually the first to be constructed, is generally orientated to face south to take advantage of the prevailing wind direction to relieve humidity. But the pattern of arrangement around the rectangular courtyard necessitates compromise in the orientation of the other buildings added subsequently. (These features have been described elsewhere by the researcher: Ahmed 1997, pp. 924-925, 937-938; Ahmed 1994, pp. 43-49.)

Buildings are constructed on a raised plinth, commonly made of compacted earth, and the floor is left bare. The raised earth plinth is ubiquitous throughout Bangladesh and is a characteristic feature of rural housing (Ahmed 1994, p. 19, 48; Muktadir and Hasan 1985, p. 84; Rashid 1991, p. 453). The plinth varies from a height of 15 cms in higher areas to 120 cms in low-lying areas (Rashid 1991, p. 453). In hilly or waterlogged areas, instead of the earthen plinth, the building is raised on bamboo or timber stilts; these materials also serve as posts in most houses. Walls in vernacular houses are generally of two types: the more common screen type is constructed of various types of organic material, often thin and porous to allow cross-ventilation, while in some regions, earth walls are prevalent. To reduce glare, openings are usually minimal and small. Natural textures are generally preferred and there is very little surface decoration.

Fig. 2.5. Characteristics of vernacular housing in the floodplains



Pitched roofs are usual, and of the gable (*dochala*) or hipped (*chouchala*) varieties; the mono-pitched (*ekchala*) roof is less common, and often used only in ancillary buildings, as are curved bamboo canopy type mantles (Ahmed and Mitchell 1998, pp. 71-73). Roof types vary (see Hasan 1985, pp. 61, 63; Chisholm 1979, p. 16) but one of the most typical in the southern floodplains is the thatched roof with a ridge of curved bamboo poles (Ahmed and Mitchell 1998, pp. 73-74). This intuitive pre-tensioning of the roof ensures that it does not sag due to weight. Historical accounts of this type of roof with a curved ridge date back to the fifteenth century (King 1984, pp. 21-23), and it may well

derive from a much earlier period. The roof is usually the most difficult to construct and most expensive part of a rural house (Hasan 1985, p. 57).

2.4. BUILDING MATERIALS IN RURAL HOUSING

Identification of the characteristics of rural housing in Bangladesh in the previous sections provides a basis for a discussion of the main building materials used. This allows for understanding the reasons for and types of attempts by agencies to provide alternatives or intended improvement of traditional building materials, often in the form of innovative construction technologies.

One of the main traditional building materials in Bangladesh is bamboo. Earth is also employed to a large extent, but not in all regions. Thatching materials in roofs vary according to regional availability. In discussing in detail the types and sources of these materials and traditional construction techniques, constraints facing their use in the present-day context are noted. This allows for a discussion of the consequences arising from the constraints.

The use of other building materials, some of which are non-traditional, has arisen as a result of the constraints on traditional materials. Instead of discussing these materials separately here, they are referred to in relation to the constraints on and resulting consequences of the use of traditional materials.

2.4.1. Types of building materials

Building materials can be divided broadly into two major types: natural materials and manufactured products. The term 'natural materials' is used here to denote materials that require minimal processing and no industrial or mechanical handling. Buildings built with these materials are locally known as *kutcha*. There are two main groups of natural materials. One is organic, derived from biomass obtained from the natural resource base, such as timber, bamboo, reeds, rushes and thatching materials, and from agricultural residue, such as jute sticks and rice straw. The other includes geologic or non-organic materials such as soil and sand. Natural stone is not included here, as Bangladesh has very scanty stone resources. However, that does not imply that stone is not used; stone is obtained from surrounding India, but tends to be used in expensive urban construction and virtually not at all in rural housing (Hughes *et al* 1994, p. 33; Rashid 1991, pp. 389-390; SKAT 1991, pp. 14, 32).

Manufactured products are produced by industrial processes, quite often requiring mechanical and fuel-based energy. The typical manufactured building products in Bangladesh are brick and reinforced concrete (RC), mainly in urban areas, locally known as *pucca*. Corrugated iron (CI) sheet is also a common manufactured product, but is not considered a *pucca* material; only brick and RC construction is generally classified as *pucca*. According to the 1991 census results, only 8% of walls and about 4% of roofs were *pucca* in Bangladesh; in rural areas the proportions were even lower, with 3% of walls and less than 1% of roofs *pucca* (Table 2.1.) (BBS 1993, p. XII).

Hence this type of construction is not discussed in this chapter. Earlier statistics from 1961-81 indicate that there had been an insignificant increase in *pucca* construction (Sultana 1993, p. 75). More recent figures indicate a 3% increase in *pucca* walls and 1.4% in *pucca* roofs over the period 1982-91, which when translated into absolute numbers, represent a considerable increase (BBS 1988, pp. 69, 72); nevertheless, the very large majority of housing continue to remain non-*pucca*. This increase has taken place mostly in urban areas, linked to rapid urban growth. In rural areas, over the same period the increase in pucca construction has been 1% for walls and 0.4% for roofs, below the national proportions. It can thus be asserted reasonably that the vast majority of housing in rural areas still utilises natural materials.

Table 2.1. Housing in Bangladesh according to durability of building materials (*adapted from BBS 1993, p. XII*)

Wall material of main house (dwelling unit)			
	TOTAL	URBAN	RURAL
Total dwelling units [Nos (%)]	19,020,489 (100.0)	3,545,923 (18.6)	15,474,566 (81.4)
Straw/ bamboo/ jute stick (%)	56.2	42.8	59.3
Earth/ unburnt brick (%)	22.7	14.9	24.5
CI sheet/ timber (%)	13.1	12.7	13.2
Cement/ brick (%)	8.0	29.6	3.0
Roof material of main house (dwelling unit)			
	TOTAL	URBAN	RURAL
Total dwelling units [Nos (%)]	19,020,489 (100.0)	3,545,923 (18.6)	15,474,566 (81.4)
Straw/bamboo/jute stick/polythene	47.3	28.8	51.5
CI sheet	48.6	53.3	47.6
Cement	4.1	17.9	0.9

However, CI sheet and brick are gaining prominance in rural areas among a limited section of households that can afford them. The ingress of these two products has in many instances resulted in buildings constructed of various combinations of manufactured and natural materials. For example, CI sheet is sometimes used for constructing entire buildings. There are also buildings with brick walls and CI sheet roofs, which are classified as semi-*pucca* (Islam *et al* 1981, pp. 15-17, 31; Sultana 1993, p. 77). The term semi-*kutcha*, although not in common usage, can nonetheless be used for denoting bamboo buildings with a CI sheet roof.

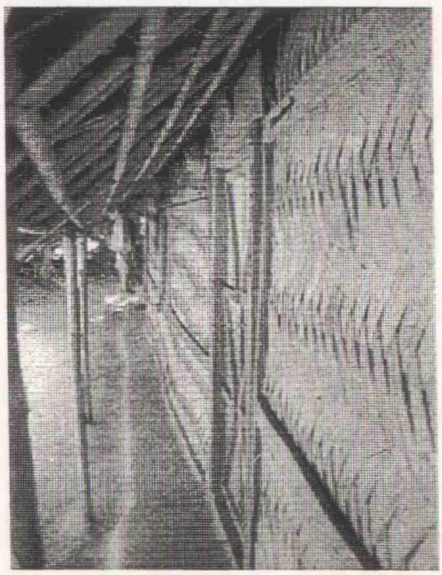
In rural areas close to urban centres there is less purity of regional use of building materials, and considerable diversity resulting from different combinations. Even as early as 1981, a survey conducted in a village close to Dhaka, yielded evidence of four house types with eight types of roofs and eighteen types of wall construction, classified by building materials (Islam *et al* 1981, pp. 31-33). Therefore, in many areas it may now not be possible to witness traditional types of rural housing linked directly to the availablity of local natural resources. The expansion of the market economy and greater links with urban areas, as well as factors constraining the availability of natural resources, have contributed to a gradual process towards heterogenity in the use of building materials. Nonetheless, it can be suggested that, as yet, natural materials such as bamboo,

earth and thatch, traditionally used in rural housing, remain the main building materials in the construction of houses by the majority of the rural population.

2.4.2. Bamboo

Bamboo is the most widely used natural building material in Bangladesh. According to the 1991 census, bamboo was used in walls of more than 56% of housing in Bangladesh and of nearly 60% in rural areas; more than 47% and more than 51% of roofs of housing throughout Bangladesh and in rural areas respectively used bamboo (Table 2.1.) (BBS 1993, p. XII). Bamboo continues to play a very prominent role as a building material and is extensively used in rural areas.

Fig. 2.6. Bamboo construction in Bangladesh



In general terms, bamboo is available in two varieties: thick-walled and thin-walled. Thick-walled bamboo is used for structural members such as posts, roof rafters and purlins. Thin-walled bamboo is split and woven into a variety of stiff mats used as walls and sometimes as roof cladding (Ahmed 1994, pp. 27-28, 30; Wells *et al* 1994, pp. 5-6). Traditionally, most households grew bamboo plantations on their own land to provide building materials. However, due to the great fragmentation and unequal distribution of land holdings in rural areas over the recent past, many households do not now have land available for such plantations (Alauddin *et al* 1995, p. 237). The shortage of bamboo in Bangladesh has been documented in various sources (Abedin and Quddus 1990, pp. 1-2; Boa and Rahman 1987, p. 7; Choudury 1984, p. 50; Dunham 1992, p. 3; Dunham 1991, p. 5; Haque 1986, p. 16; Johnson and Ritchie 1993, pp. 1, 20; SKAT 1991, p. 62; Wells *et al* 1994, pp. 25-28). Among various factors, it has been largely attributed to population increase, demand exerted by increasing urbanisation, mismanagement of bamboo sources and also bamboo disease. The scarcity of bamboo is reflected in its sharp increase in price; in the decade 1980-90 its price increased almost threefold, a rate higher than general inflation (see Chart 2.2.) According to more recent estimates, the price of a bamboo pole has increased further from Tk 85 in 1990 to Tk 100 in 1997.

Another major contributor to the reduction of bamboo supply is natural disasters. Bamboo cannot grow on water-logged land and requires a well-drained site (Abedin and Quddus 1990, p. 10; Choudhury 1984, pp. 76-77), and generally is grown on high land, but unusually high floods, such as those in 1987, 1988 and 1998 have greatly devastated the already dwindling stock. Secondly, the destruction of houses by floods and cyclones results in an increased demand for building materials to build new houses, accompanied by a sharp increase in price. Estimates indicate that in 1988, of total houses destroyed by the floods, more than 80% were bamboo and thatch houses (Dunham 1989, p. 12) (see Chart 2.3.). This added greatly to existing pressure on supply (Abedin and Quddus 1990, p. 21). Reduced supply eventually affects the ability of rural communities to

recover from disasters (Dunham 1989, p. 6), and hence leaves them more vulnerable to further hazards.

Chart 2.1. Price of bamboo (Tk/culm) in Dhaka, Bangladesh from 1980 to 1990 (*SKAT 1991, p. 41*)

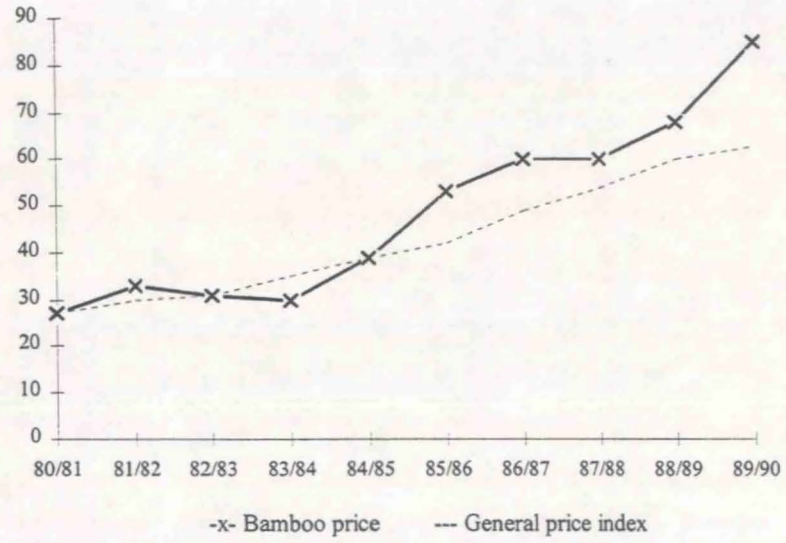
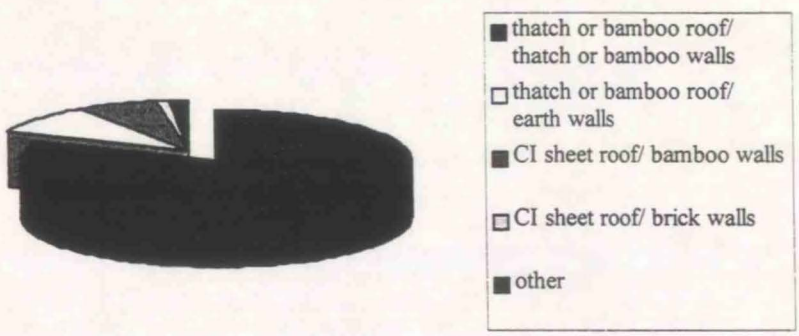


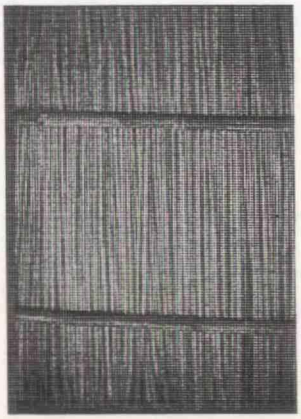
Chart 2.2. Percentage distribution of damaged housing in 1988 floods by roof/wall composition (*adapted from Dunham 1989, p. 12*)

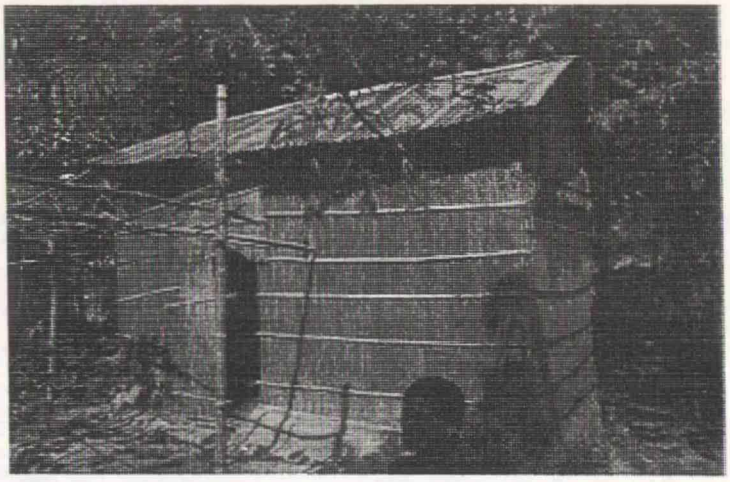


For households that can afford it, the response to the shortage of bamboo is to opt for manufactured materials such as brick and CI sheet, often entailing dependence on skilled labour and the service of professional contractors. Brick for house construction is more prevalent in urban areas, and affordable by a relatively larger minority of affluent households, but it has been gradually adopted by a smaller minority of affluent rural households too. It is also used extensively in construction of non-residential buildings. However, firing bricks by use of timber has contributed to serious deforestation in Bangladesh (Alauddin *et al* 1995, p. 242; Wells *et al* 1994, pp. 50). During the last decade, the government has declared the use of timber for brick manufacture illegal (SKAT 1991, p. 50). But because of the lack of adequate law enforcement, timber is still consumed and entire areas depleted of their timber resources, often reported in local daily newspapers (for example, see Daily Star 1995). The problem is that the alternative fuel for brick production is coal, largely imported from surrounding India, and thus relatively expensive compared to local timber, as well as not easily available everywhere (SKAT 1991, p. 50). Brick manufacturers are therefore averse to using coal, as it significantly reduces their profit margin.

To further add to the problem, stripping topsoil for brick production exposes the subsoil, often rendering the land unsuitable for agriculture. This is not a new problem, it was documented in the early 1970s (Salyar *et al* 1974, p. 74). If anything, the problem has intensified, as recent newspaper reports testify (Daily Star 1995). In a context like Bangladesh with a severe crisis of land, the loss of cultivable land in this predominantly agricultural country serves to exacerbate the difficulties of poor farmers. It is evident that such a situation is hardly sustainable. According to one source, removal of topsoil is not a problem, as annual alluvial deposits replenish the land (SKAT 1991, p. 51). However, this can only hold true for areas adjacent to rivers; in inland areas brickmaking is certainly liable to impact on land. Furthermore, an observer has recently pointed out that the increasingly large concentration of brick industries around urban areas is a source of air pollution (Islam 1996, p. 382). Nevertheless, despite such major environmental impacts, in the absence of alternative materials for pucca construction, especially in urban areas, and with the existing extensive brick industry in the country, it is foreseeable that with increasing urbanisation the use of brick will continue and possibly further expand.

Fig. 2.7. Jute stick is widely used as a building material by the poor

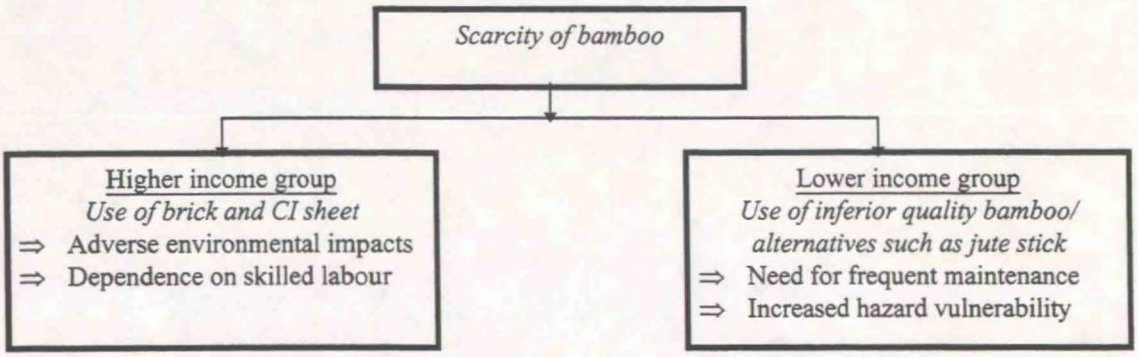




For the majority of less affluent households that cannot afford manufactured materials the only recourse is to continue using natural materials. However, because materials such as bamboo are gradually becoming expensive and no longer readily available, the option is to settle for lower quality cheaper materials, resulting in flimsy and perishable houses that are inadequate and require constant repair (Wells *et al* 1994, p. 51). For example, jute stick, an agricultural by-product, was in former times used for the construction of ancillary structures within the homestead, such as cowsheds or granaries (Ahmed 1994, p. 105). Now, due to the scarcity and high price of bamboo, many poor households have gradually begun to use jute sticks to build the walls of their houses (Wells 1995, p. 81). Such houses are of low quality and tax the limited resources of the households by the need for their continuous upkeep. The help of the neighbouring community is difficult to enlist on such a regular basis, and therefore the burden on the individual household is large.

There is hardly any less expensive alternative to bamboo for building posts. Bamboo posts require periodic replacement, generally over five year cycles, and thus poor households who cannot afford to do so are compelled to dwell in a house with a weakened and thereby hazardous structure. The main decay to bamboo posts occur at the base, usually embedded directly into the ground and is hence in contact with ground water or moisture. An impaired base implies that in strong winds the house is susceptible to easy collapse. Literature indicates that even in the late 1980s households had begun to use smaller and weaker pieces of bamboo in house construction to cope with increased price (Dunham 1991, p. 5). It would not require a cyclone to damage such houses; simply strong winds during monsoon showers are sufficient.

Fig. 2.8. Effects of bamboo scarcity on households with different income levels



2.4.3. Earth

In spite of Bangladesh's wet climate - annual floods, high rainfall and humidity - there are earthen buildings in many areas. However, the areas with the highest concentration of earthen buildings tend to have drier micro-climatic conditions and a higher elevation than the floodplains comprising the majority of the land in Bangladesh. According to the 1991 census, 24.5% of rural housing had earth walls (Table 2.1.) (BBS 1993, p. XII). Despite the prevalence of earth as a building material and professional interest in improving traditional earth construction technologies (SKAT 1991, p. 66), there has been minimal agency effort in this type of construction in Bangladesh. The government Housing and Building Research Institute (HBRI) has undertaken extensive research into various methods for the improvement of earth construction (Alam *undated*, pp. 4-5; Haque 1986, pp. 17-18). However, there are hardly any examples of application of these methods in the field or dissemination of research findings (Dunham 1989, p. 16; SKAT 1991, p. 66).

There are two main types of traditional earth construction in Bangladesh: packed earth and unbaked earth blocks (Dunham 1989, pp. 15-16). The packed earth technique is the most common type of earth construction in Bangladesh (Dunham 1989, p. 15), essentially a method of building in longitudinal strata, allowing each stratum to dry before the next one is begun. There are also examples of wattle-and-daub construction where wall panels of bamboo mats, jute sticks or reeds are plastered on one or both sides with mud (Hasan 1985, pp. 60-62; Islam 1993, p. 7). Quite often, the lower part of the building, which is exposed to water is plastered, leaving the upper

portion unplastered to allow ventilation, producing buildings which are part earthen and part bamboo-screened (Ahmed 1997, p. 924; Hasan 1985, p. 195). The combination of these two materials - bamboo and earth - have created a local vernacular architectural idiom. The researcher has discussed in detail types of earth construction in Bangladesh and regional variations elsewhere (Ahmed 1994, pp. 17-34).

Fig. 2.9. House being built in the packed earth technique

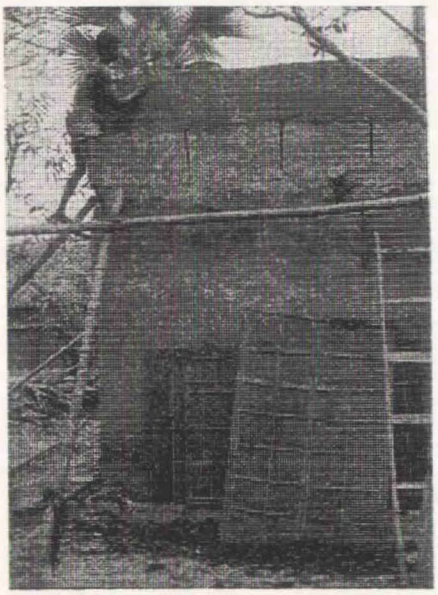
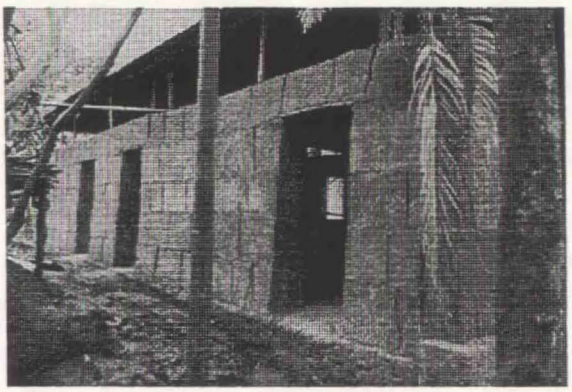


Fig. 2.10. House being built with large earth blocks *(photo: D M Hasan)*



There is hardly any information available on the supply of earth for rural housing. This is possibly because earth is generally not a purchased commodity, but freely available at the point of demand (SKAT 1991, p. 44); it is seldom excavated far from the construction site and is often excavated adjacent to it (Dunham 1989, p. 15). Hence earth as a building material has as yet a lesser linkage to the cash economy than materials such as bamboo. However, there are initial signs of stress affecting the free or low-cost procurement of this material (Islam 1993, p. 7); concurrent with increasing pressure on most natural resources in Bangladesh, limitations on free availability of earth for house construction are also bound to intensify.

One of the main problems with traditional earthen buildings is that they tend to collapse in floods, (Dunham 1989, p. 16; UNDP 1987, pp. 5.4, 5.7, A5.1-4), while bamboo buildings can be dismantled and the materials salvaged and re-assembled; the monsoons and wetness of the Bangladeshi environment generally present difficulty. It has been suggested that building with earth blocks stabilised with cement may help in overcoming this (SKAT 1991, p. 66; UNDP 1987, pp. 5.12-5.13, 5.15). There have been agency attempts in the past to build with stabilised earth blocks, but they ran into problems and were discontinued subsequently, without any examples of spontaneous local replication (Chisholm 1979, pp. 68, 70; Dunham 1989, pp. 17-18; Khan 1985, p. 98; SKAT 1991, p. 66). In this study, more recent examples of stabilised earth construction are investigated to understand its prospects and problems.

2.4.4. Thatching materials

According to the 1991 census, more than 50% of rural housing in Bangladesh had thatched roofs (Table 2.1.) (BBS 1993, p. XII). However, the census does not distinguish between naturally growing fibrous materials and agricultural residues used for thatching. The distinction between the two is important and is noted below. In the past, varieties of long grass and reeds were widely available and the wet terrain allowed abundant growth of these marshy and riverside fibrous materials (Sultana 1993, p. 84). This natural supply was conducive to self-help housing; people could freely collect fibrous materials for thatching their roofs from surrounding areas (Ahmed 1997, pp. 922, 937). However, the increasing needs of settlements and agricultural and grazing land has progressively taken over most of the areas with natural vegetation (Alauddin *et al* 1995, p. 253) thereby reducing the supply of wild grass and reeds.

Literature suggests that in the early 1980s, poor rural households had already begun to use rice straw as thatch for roofing (Rahman 1993, p. 88); it is an agricultural by-product and thus more widely available (rice is one of the main crops in Bangladesh) than most other types of thatching materials. Rice straw is less durable than other thatching materials, but the scarcity of other fibrous materials has prompted its use. Its main use is as fodder and fuel (Alauddin *et al* 1995, p. 223; Wells *et al* 1994, p. 33), and in areas where there is a greater demand for such uses, it can be more expensive than other more durable, and less available, thatching materials (Carter 1997, p. 16) (Table 2.2.).

Fig. 2.11. Constructing a thatched roof on the ground before lifting it on the building

Table 2.2. Thatching materials in Sundarban, Dinajpur district (*Carter 1997, p. 16*)

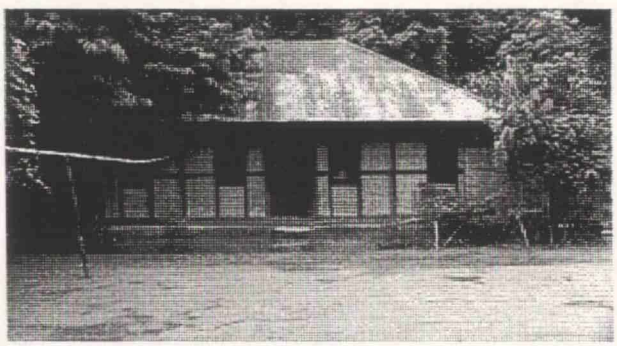
Type	Durability (years)	Comparative cost (%)
Rice straw	1-2	100
Wheat straw	2-3	60
Chon grass	5-7	75
Sugar cane cover	5-7	150

Since the majority of the rural population owns very little land or is made up of landless and marginal farmers, access to agricultural products such as rice straw is difficult. It is generally sold in the market and wealthy farmers view it as a cash item, and the price is often quite high (Carter 1997, p. 16). Poor households who use rice straw for thatch have to buy it from markets in small towns, often at great distances away from the villages (Islam *et al* 1981, p. 13). Travelling this distance and transporting straw adds to its expense, becoming beyond the reach of most poor

households. For them, what is still available is waste rice straw, of poor quality and little in demand for fodder or fuel. This results in lower quality roofing, requiring frequent maintenance.

The main rice harvest in Bangladesh of *amon* paddy is usually two to three months after the monsoons. More recent high-yielding *irri* paddy varieties can be grown throughout the year, but the short stalked irri straw cannot be used for thatching (Carter 1997, p. 16). Thatch requires maintenance and replacement during the rainy monsoon season, and straw stored after the harvest is utilised for repair of roofing. However, with the reduced size of landholdings of poor households, there is very little available storage space. Poor households cannot afford large quantities of straw, nor have the space to store it for the prolonged period until the next harvest. Wealthy farmers, who have storage space, store straw for sale in the market and are not willing to supply or store it for roof maintenance for poor households.

Fig. 2.12. House with CI sheet roof and walls
(photo: D M Hasan)



Accompanying the gradual scarcity of good quality thatching materials, CI sheet has become the preferred roofing material (Ahmed 1994, pp. 10-14). But in addition to being much more expensive than thatch, construction with CI sheet entails a more substantial and expensive roof frame than for thatch roofs. This requires specialised workmanship, affordable only by affluent households. If affordable, CI sheet is also used for walls. It is a status symbol for the rural affluent and most households aspire for it. The use of CI sheet is not entirely new, but a phenomenon that has gained prominence over the past few decades, hand in hand with the diminishing supply of natural building materials. Alternatives to thatching materials, such as CI sheet, are examined in this study, presented in Chapter 6, Section 6.4.3.

2.5. CONCLUSIONS

A review of some of the basic constraints impeding the capacity and prospects of low-income communities in the developing world to secure adequate housing indicate a skeletal framework of inquiry within which questions regarding efforts to address those constraints can be positioned. Examining the context of rural housing in Bangladesh, these constraints are found to apply, hence this framework of inquiry can be utilised for that context. The following set of general and basic questions comprise the framework of inquiry:

- Financial resource constraints

⇒ How do agencies finance housing for low-income households?

⇒ How do their approaches to financing relate to the two main types of agency intervention for poverty alleviation, namely 'neo-liberal' and 'welfarist' models?

⇒ What are low-income household strategies for housing finance?

- Hazard vulnerability

⇒ How are post-disaster housing rehabilitation projects implemented?

⇒ How is the disaster rehabilitation to long-term development continuum addressed?

⇒ What are the specific hazard-resistent technical innovations and building typologies promoted by agencies?

⇒ What are household strategies of coping with natural hazards?

- Natural resource constraints

⇒ What are the effects of remedial approaches of agencies on the diminishing supply of natural building materials?

⇒ What are the specific technical solutions, resulting from these approaches, that seek to improve performance of vernacular low-income rural housing?

⇒ What are community and household level responses to natural resource constraints?

This basic set of inquiries, exploratory in nature, point to investigation appropriate to this study. In the course of the next chapters they are more narrowly defined, focusing on crucial aspects of rural housing and the actions of agencies and low-income households. This contributes to selection of specific topics for discussion to formulation of questions utilised during empirical investigation to gather information and to gain an understanding of important issues through talking to stakeholders of rural housing programmes and other relevant individuals/groups.

A variety of secondary sources was reviewed in this chapter, but there was hardly any comprehensive literature dealing with the perceptions and housing positions of low-income households at the micro-level. Also, there are no in-depth studies of the effects of agency action in Bangladesh and the changing scenario of rural housing within the expanding framework of such action. This points to the need for a database of primary information in order to understand and develop knowledge about the overall state-of-affairs in the field. Because of the lack of secondary sources directly relevant to the topic of this research, primary information, gained by empirical investigation, forms the substance and the main basis of the results of this research and contributes to the main body of the study. Thus the research methodology is principally orientated towards and reliant upon empirical investigation and its findings. This is discussed in the next chapter.

- *CHAPTER 3*

RESEARCH METHODS

3.1. INTRODUCTION

In this chapter, methods employed in operationalising this research are discussed. General literature on research methods is also reviewed, but texts on research in development studies is given more importance.

This chapter has the following sequential development:

1. The research problem is presented.
2. The research design is explained.
3. The research aims are stated, indicating their bearing on formulation of the research questions.
4. The research problem, design and aims pose a main and fundamental research question. To find answers to that question, it is necessary to derive a set of sub-questions from it.
5. Empirical investigation methods to find answers to the research questions are described.
6. Methods for analysing collected data and interpreting findings of that data are discussed.

3.2. SALIENT ISSUES IN THE RESEARCH INQUIRY

In this section, the research problem is explored. The articulation of the research problem prompts a specific type of inquiry; the research methods are designed in response to this. The research aims are re-stated in the light of the research problem and design, from which the emerge.

3.2.1. Research problem: lack of adequate community-based research in the field

The previous chapters point to several important issues. They can be encapsulated as:

- There is a recent lack of emphasis in development discourse on rural housing compared to urban housing, yet the majority of the developing world lives in rural areas and is expected to continue to do so in the near future. Bangladesh is a typical example.
- Housing of low-income rural communities faces serious problems. In Bangladesh, this is most clearly indicated by its vulnerability to natural hazards.
- A number of agencies have begun to address problems in rural low-income housing within a context of a rapidly expanding network of agencies throughout rural areas of Bangladesh. Most housing programmes have primarily arisen in response to natural disasters; because of the lack of a widespread emphasis on rural housing, these attempts generally do not represent a development effort, but rather action arising from extreme circumstances. Nonetheless, in some cases agencies attempt to address problems extending beyond post-disaster reconstruction, often in innovative ways, such as providing financing for house building.
- These programmes in Bangladesh operate without any national policy or benefit of rigorous research, and studies in this field are generally limited, especially which reflect the perceptions of low-income households at the micro-level of the rural community.

These issues suggest that the basic problem is the lack of an in-depth, systematic and investigative form of community-based research on low-income rural housing in Bangladesh that may inform knowledge and efforts of building housing in rural areas

In this section this problem is elaborated. To begin, it is useful to refer to the three main impediments to low-income communities in the developing world in building adequate housing, set out in Chapter 2, Section 2.2.:

1. Financial resource constraints
2. Hazard vulnerability
3. Natural resource constraints

Indicated in the literature discussed, these constraints were found to prevail in a number of countries in the developing world in various forms. These constraints also beset low-income rural communities in Bangladesh. Several agencies attempt to address natural disasters, often by providing housing believed to be hazard-resistant and an improvement on traditional designs. Although still responding primarily to natural disasters, agencies have also begun to address financial resource constraints. New ways of financing and implementing rural housing projects have been undertaken, often combined with innovative types of design and construction; natural resource constraints have also begun to be addressed by these technical innovations. This directly prompts the question: what are the results of these efforts with regard to their target group - low-income households?

Most rural housing programmes by agencies in Bangladesh consist of a delivery system that provides funding for and implements what agencies consider improved housing. Literature indicates that only a limited evaluation of rural housing programmes has been undertaken in Bangladesh. These have mostly been carried out either by agency staff members themselves or by evaluators appointed by them, and are mainly concerned with a particular housing programme of a single agency (for example, see EDM 1998; Hodgson 1990; Islam *et al* 1989; Palmer-Jones *et al* 1992; Uddin 1993). Thus these evaluations do not offer a comprehensive and truly independent study of the overall state-of-the-art of agency-based housing in the context of an expanding network of agency action. Furthermore, evaluations have generally been from a professional standpoint and the views of beneficiaries have been less well represented. Indeed, there are hardly any examples of micro-level community-based research of rural housing in Bangladesh. **Hence there is a need for independent evaluative research of rural housing in which the views of low-income households are better represented. There is also a need to produce a more comprehensive picture by a comparative study of various housing programmes as well as housing built by households independent of direct agency input**. The research problem takes note of both these needs, and this study attempts to address them.

In most studies of rural housing in Bangladesh undertaken so far, researchers/evaluators generally have spent considerably less time in the field then the present researcher; being usually outsiders, this did not allow rapport with the community, necessary for an in-depth understanding to be established. Typically, in ethnographic research, one to two years, or even longer, is needed to study the community (Ellen 1984, p. 65). Resources and time constraints did not allow this length to the researcher, but the researcher's Bangladeshi background, unlike typical ethnographic researchers' unfamiliarity with the local context, meant such an extended period was not necessary. Nevertheless, several months were devoted to fieldwork, visiting and living in rural areas, and certainly much more time was spent in the field than most previous researchers/ evaluators have done and special attention was given to developing rapport with low-income communities.

Literature on low-income housing in developing countries largely focuses on urban areas. On the other hand most studies in rural development deal mainly with agriculture, small-scale enterprises and aspects of rural development other than housing (e.g. United Nations 1989). These studies are quite often prepared by authors with a social sciences background, and the lack of reference to housing in such literature perhaps stems from the limitations of expertise of social scientists in building construction. Studies undertaken by authors with an architectural or engineering background quite often focus primarily on technical and design aspects of rural housing (see articles in Hodgson *et al* 1999, e.g. by Sorill, pp. 19-21and Islam, pp. 53-58). However, there is space for both approaches. If housing can be viewed as a social artifact, research methods typically employed in the social sciences can be relevant to the study of housing. At the same time, a background in building design and construction can lend comprehensiveness to the study. This study therefore aims to bridge the gap between these two approaches by adapting social science research methods for the study of rural housing, thereby adopting an inter-disciplinary linkage.

There are examples of collaboration between social scientists and engineering professionals in other parts of the world. Glaeser's (1995) study of rural housing in Tamil Nadu, India, is an example of such effort. There are also recent attempts by scholars, primarily in Europe or North America, to insert housing issues into the wider domain of development studies (e.g. Dudley 1993). However, in most developing countries, such examples, particularly any written by their own nationals, are lacking. Bangladesh illustrates this point; there are hardly any examples of multi-disciplinary study in the field of low-income rural housing, yet the nation is predominantly rural and a substantial section of development funding goes to rural development.

In rural development in Bangladesh, there are no agencies solely involved in housing provision; housing is one of several developmental activities in which they engage. This may suggest an integrated rural development approach, but there is in fact hardly any discourse on housing in most studies of rural development in Bangladesh (e.g. see Hye 1996; Rahman 1994; Ullah 1996) or it is mentioned only in passing (Sen 1995, pp. 107-110). Even though many agencies do carry out housing programmes, most of the literature deals with their other development activities -

agriculture, credit, gender issues, income generation, etc. There is a plethora of publications on such topics, compared to which, publications on housing are scanty. There is thus a definite need for research into housing as a development activity in order to fill lacunae in existing knowledge in the field of development studies in Bangladesh. The proliferation of grassroots organisations and NGOs (some of which attempt to improve housing along with other community development activities) is a phenomenon not only characteristic of Bangladesh, but also evident in many other parts of the developing world (Slim 1997), hence this study has wider relevance.

3.2.2. Research design: comparison of views of micro-level stakeholders

Because of the nature of the research problem, pointing to the need to investigate the effects of agency action in housing for low-income rural communities, this study pertains somewhat loosely to the paradigm of evaluation research. However, the study is not solely about agency efforts, although that is an important concern; rather it assesses the housing position of low-income households, essentially from their viewpoints. It is thus a piece of evaluative research on the problems and prospects facing the main stakeholders in the provision and habitation of housing.

The 'dominant evaluation paradigm' according to Marsden and Oakley (1995, pp. 27-29) has been 'cost-benefit analysis', a quantitative evaluation model. This model has not been adopted in this research because of time and resource constraints, and more importantly, because it would not have responded to the aims of this research. Design should accord with the purpose of research, as Hakim (1987, p. 28) states:

> If one is looking at the social structural determinants of people's behaviour and views at the macro-level, then designs using large scale surveys are appropriate. But if one is looking at the way people respond to these external realities at the micro-level, accommodating themselves to the inevitable, re-defining the situation until it is acceptable or comfortable, kicking against constraints, or fighting to break out of them, or even to change them, then qualitative research is necessary. If surveys offer the bird's eye view, qualitative research offers the worm's eye view.

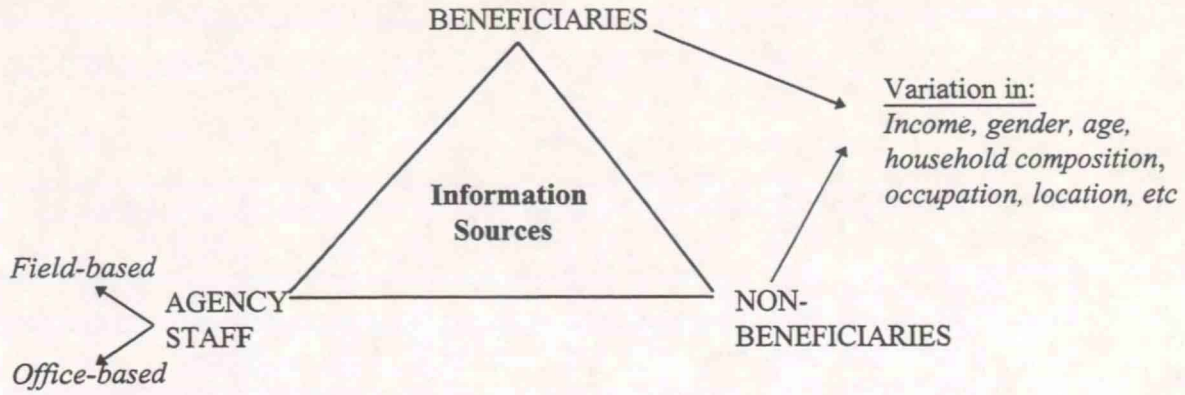
Such 'micro-level' qualitative understanding of adjustment and response of low-income communities to 'external reality' is a prime concern of this research; the following chapters attempt to understand and present the reality of the lives of individuals and households whose views lack a widespread and effective medium of expression. A primary focus on qualitative responses, revealed in in-depth discussions/interviews in extended field visits is more useful in gaining understanding of subtle, often unmeasurable and hidden aspects of human perception, behaviour and aspiration relating to the housing process than a more readily tabulated and wider survey. Nonetheless, some quantitative features are also recorded and analysed - house size, household income, house cost and household investment in construction - and a number of quantitative tests are carried out to compare different approaches to funding, implementing and designing housing.

A note on 'stakeholders' is needed here. In a broad sense, there are a variety of stakeholders in rural housing. To operationalise this research, it was necessary to limit the stakeholders to the main and directly involved groups, to elicit and compare their views on a similar set of issues. This comparison, supported by the researcher's field observations and secondary information/ documents, provides a basis for the main body of this study. There are three main stakeholder groups:

1. Beneficiaries of agency-supported housing, consisting of low-income rural households, also known as the target group.
2. Non-beneficiaries living in the vicinity of housing projects.
3. Agency staff members operational in the management and implementation of rural housing programmes.

Because an intervention such as a housing programme has a wide-ranging impact on the community beyond its direct beneficiaries, non-beneficiaries can be considered as stakeholders of such programmes. A comparison of views of beneficiaries with that of non-beneficiaries in the same area lends validity to the results of the field investigation. Additionally, it allows for obtaining a broader view of the housing positions of low-income households, the fundamental concern of this study. Therefore this stakeholder group, allowing comparison, was incorporated within the conceptual framework of the empirical investigation (see Fig. 3.1.) (Appendix A.2. presents the profiles of households studied). This was a measure to overcome bias by 'triangulation' (Abrahamson 1983, pp. 61-64; Theis and Grady 1991, pp. 29-30). To a small extent, 'time-triangulation' (Mikkelsen 1995, p. 82), that is, enhancing reliability by visiting the same cases several times over a period of time was also incorporated; the Grameen Bank 'cluster-villages' in Manikganj were visited three times over a period of two years.

Fig. 3.1. Triangulation of information sources



Because of the intent to study a number of rural housing projects comparatively, to arrive at general conclusions about the field, a 'case-study' approach (Robson 1993, pp. 146-166), consisting of multiple case studies of a range of rural housing projects was adopted. Yin (1994, p. 15) has provided a list of the use of case studies in evaluation research; some of these, such as to explain, describe and illustrate, are relevant to this research. Multiple cases have been chosen with

a view to achieving what Yin (1994, p. 45) has termed 'literal replication' (predicting similar results) and also 'theoretical replication' (producing contrasting results) (also see Robson 1993, p. 379). In selection of the household sample, variation was sought within the category of 'low-income' in location, gender and age of household head, differentiation in income and livelihood, household size, etc to obtain a broad insight. This corresponds to methods followed typically in PRA (Participatory Rapid Appraisal or Participatory Rural Appraisal; previously RRA: Rapid Rural Appraisal) (Theis and Grady 1991, p. 34), a particularly relevant research method for the developing context (for background, methods and definitions of RRA and PRA, see Chambers 1994, pp. 97-105; Mikkelsen 1995, pp. 67-83; Theis and Grady 1991, pp. 22-34).

Elements of ethnographic research were also adopted, such as the importance of fieldwork and case studies (Ellen 1984, pp. 64-67), and emphasis on the viewpoints of local communities (Theis and Grady 1991, p. 24). However, a completely 'emergent' approach as in ethnographic research was not followed; instead, as in most case study-based research, the approach to fieldwork was somewhere between the extremes of the 'emergent' and 'pre-structured' modes (Robson 1993, pp. 148-149). Derived from ethnographic research, some of the methods and techniques associated with PRA (but not all; PRA usually seeks a broader understanding of community issues beyond the scope of the specialised nature of this research on housing) (Mikkelsen 1995, pp. 67-83; Pratt and Loizos 1992, pp. 66-77; Theis and Grady 1991) were found particularly suitable in field investigation. PRA relies on group discussions with stakeholders, in which their participation and views are given primary importance. Some of the methodological issues in PRA are presented in Box 3.1. These are discussed further when data collection methods are explained in Section 3.3.2.

Table 3.1.Characteristics of PRA methods

Duration	Short
Cost	Low to medium
Depth	Preliminary
Scope	Wide
Integration	Multi-disciplinary
Structure	Flexible, informal
Direction	Bottom-up
Participation	High
Methods	Basket of tools
Major research tool	Semi-structured interview
Sampling	Small sample size based on variation
Statistical analysis	Little or none
Individual case	Important, weighted
Formal questionnaires	Avoided
Organisation	Non-hierarchical
Qualitative descriptions	Very important
Measurements	Qualitative or indicators used
Analysis/ Learning	In the field and on the spot

(Excerpted from Theis and Grady 1991, p. 34)

3.2.3. Research aims: the basis of inquiry

Now that the research problem and design approach have been articulated, it is necessary to state the research aims in their light. The fundamental aim is to gain an understanding derived primarily from the perceptions of low-income households in rural areas of Bangladesh of housing strategies that serve their needs. In order to realise this aim, it is necessary to disaggregate it according to three main aspects comprising the housing process: financing, implementation and housing design. Although distinct, these aspects are highly inter-related, encompassing the totality of the housing process. Their importance emerged to a great extent from the impediments confronting low-

income communities in building adequate shelter, discussed in Chapter 2, Section 2.2. The following research aims are reiterated with reference to these aspects of the housing process, from which the research questions emerge:

1. To investigate the results of various approaches to building low-income rural housing in Bangladesh.
2. To examine approaches to financing low-income rural housing.
3. To examine strategies followed in implementation of construction of low-income rural housing.
4. To examine design aspects of low-income rural housing.
5. To arrive at conclusions that inform knowledge, policy and practice in the field of low-income rural housing.

The first aim addresses the research problem, that is the lack of adequate micro-level community-based studies of low-income rural housing in Bangladesh, and is developed into the main research question presented below, which permeates this study, serving as its foundation. Emerging from the first aim, the second, third and fourth aims suggest the investigation to be carried out in studying the main aspects of the housing process. These aims form the basis of three research sub-questions, derived from the main research question, each of which are dealt with respectively in Chapters 4, 5 and 6. Arising from the previous aims, the fifth aim aspires to contribute theoretical and practical knowledge to the field and comprises the core concern of Chapter 7, which presents the conclusions and implications of this study.

3.2.4. Research questions: an empirical orientation

This research is founded on a main question and the purpose is to seek substantiative information to provide answers to it. The answers to this question requires an evaluative inquiry. The main research question is:

> **What are the results of strategies to address problems in building low-income rural housing in Bangladesh if these strategies are examined primarily with respect to the views of the main stakeholders in the provision and habitation of housing in terms of fulfilling their requirements?**

Because of the lack of sufficient literature in the field, the essential orientation of the study had to be empirical. This involved interviewing of and discussions with a sample of each stakeholder group of selected rural housing programmes, supplemented by the researcher's observations of the characteristics and context of housing. To operationalise the research, a set of sub-questions derived from the main question have been formulated, corresponding to the three main aspects of the housing process: financing, implementation and housing design. These sub-questions assist in elucidating the exact nature of inquiry embodied within each of these distinct but highly inter-related thematic aspects. Seeking answers to these individual sub-questions and their inter-relationships allows for providing answers to the main research question. The sub-questions are:

The first derived sub-question: **Financing**

How far does the mechanism of providing or acquiring funds for house construction and maintenance by low-income households meet expectations and needs of the stakeholders?

The second derived sub-question: **Implementation**

To what extent does the process of implementation of housing of low-income households in rural areas facilitate effective production and management of the housing?

The third derived sub-question: **Housing design**

What characteristics of design and physical organisation of rural housing in specific contexts best fulfil performance and satisfaction criteria for all stakeholders?

3.3. EMPIRICAL INVESTIGATION: THE RESEARCH BEDROCK

The main thrust of investigation in this research is necessarily empirical, because of the lack of comprehensive community-based literature on low-income rural housing in Bangladesh, elucidated above when discussing the research problem. Empirical investigation in this research was carried out in two main stages: the preliminary/exploratory field study and the main field study. At a later stage, short follow-up visits were undertaken, the findings of which are integrated into the presentation of findings of the main field study .

- **Preliminary/Exploratory field study:** In December 1996, the First International Housing and Hazards Workshop was held at the Bangladesh University of Engineering and Technology (BUET). Representatives of several prominant agencies involved in low-income rural housing programmes, as well academics and professionals with interest in this field attended. The link between natural disasters and agency-based housing programmes is indicated by the title. Participation in this workshop allowed the researcher to establish contacts useful for this research and to gain an insight into the current state of affairs in the field of low-income housing. These contacts with agency staff members were followed up when arranging field visits for the main field study, and together with literature review of recent agency-based programmes (see Chapter 1, Section 1.3.), contributed to the selection of case study programmes. Project documents and other relevant literature was also collected at this time and most agency staff met at the workshop were interviewed in detail during the main field study. The workshop also provided information about other agencies involved in rural housing programmes, whose staff members did not attend the workshop; following the workshop, contacts with staff members of these agencies were also established. The workshop and contacts with agencies resulted in two exploratory field visits: to the Grameen Bank cluster village in Manikganj and the Local Government Engineering Department (LGED) project in Chittagong, both studied in detail during the main field study. These preliminary field visits

allowed informal discussions with beneficiaries and local residents, an understanding of the nature of the projects, local conditions and problems, and better gauging the scope of investigation possible during the main field study.

- **Main field study:** The main body of empirical information relating to the research questions was collected during the main field study. The following sections present its important aspects.

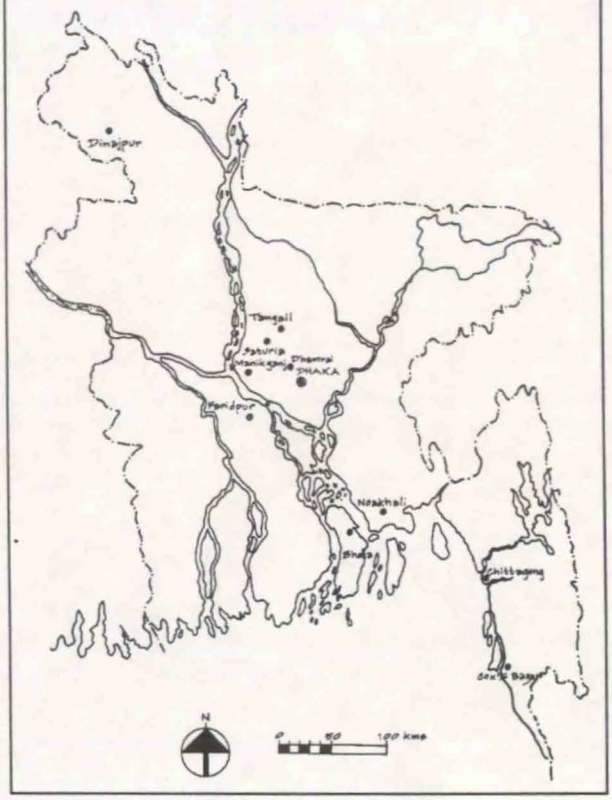
3.3.1. Selection of case studies and sampling

Case studies of agency projects consist of rural housing programmes, current or implemented in the recent past. Housing projects of these agencies in selected locations were studied and information was sought from a sample of beneficiary and non-beneficiary households in each location. Additionally, discussions were carried out with local key informants and other residents, building materials producers and agency fieldworkers.

3.3.1.1. Case studies of agency programmes: a wide cross-section

Twelve rural housing programmes have been selected as case studies. The basis of this selection is explained in Chapter 1, Section 1.3. when discussing recent agency-based programmes and also above when discussing the preliminary/exploratory field visit. Distribution of the household sample in these programmes, their types and locations are shown in Appendix A.2., Table A.2.2. The selected case studies represent an wide cross-section of agency types, rural housing programmes and geographical location, intentionally chosen to include a wide range of agency types and programmes. Study of a range of cases should provide an understanding of which approaches have the best results and the reasons for that. Locations have a reasonably wide geographical spread within Bangladesh, contingent upon time and resources for available fieldwork (see Fig. 3.2.); this allowed investigation of housing in varying environmental and local conditions. The common factor within all the programmes is that all targeted low-income rural communities. Interviews with agency staff members were mostly carried out after visiting the projects, because of the importance of an informed position from which to conduct the interview, but during field visits discussions were extensively carried out with agency fieldworkers.

Fig. 3.2. Map of Bangladesh showing locations of agency programme case studies



3.3.1.2. Household samples: diverse selection within a low-income grouping

The method of sampling adopted is of the type 'purposive sampling' (Abrahamson 1983, pp. 238-241; Robson 1993, pp. 141-142). According to Robson (1993, p. 141, 142), 'The principle of selection in purposive sampling is the researcher's judgement as to typicality or interest' and is 'an approach commonly used in case studies'; the research design necessitated such an approach. 'Key informants' such as local leaders and community development workers, a valuable source of information, are also often instrumental in reducing bias in representation in purposive sampling by assisting in selection of households appropriate to the central issues of the research (Mikkelsen 1995, p. 205). Such informants were sought at an early stage of fieldwork to allow an initial introduction to the community. However, caution was exerted; personal judgement was also used to avoid undue reliance on them.

As typical in PRA, a small sample size was selected, incorporating variation (Theis and Grady 1991, p. 34) in household profiles within the low-income population group. Low-income households were defined as those having a total monthly income of Tk 5000 or less. Even within this low-income category, diffentiation in income was taken note of in sample selection, to enable understanding the effects of such differentiation. Some of the sampling techniques followed in PRA, such as selection of 'less visible' (or maginalised) community members and visits to remote areas [to overcome 'tarmac-bias' - often development workers/researchers visit areas with good road connections (Pratt and Loizos 1992, p. 66)] were followed, in the attempt to incorporate a variety of suggested mechanisms to overcome bias in response (Mikkelsen 1995, p. 206).

Typically as in rural areas in many parts of the world, Bangladeshi villagers are suspicious of outsiders, often afraid of forthcoming harmful intervention, or conversely, anticipating financial or material assistance (Hershfield *et al* 1993, pp. 241-248; Howard 1989, p. 55). Therefore in all cases introduction to the community was provided by local agency fieldworkers, assisting in dispelling suspicion, outlining and explaining the reasons for the visit. At later stages, after rapport was established with some community members, they assisted in introductions to neighbouring communities for subsequent interviews. Attempts to interview the community without such introductions might not have produced positive results. Additionally, to begin with, as typical in ethnographic research (Howard 1989, pp. 54-55) in each location a few days were spent in establishing rapport with the community and gaining familiarity in informal ways before households were selected for in-depth interviews.

Another 'ice-breaker' technique, typically followed in PRA, is for outsiders to relinquish their positions of power, at least temporarily (Pratt and Loizos 1992, pp. 74-75). Advocates of PRA, such as Chambers (1995, pp. 33-35) promote a similar approach to revision of power relations during development work and research. For this researcher, with an urban and educated background, to gain acceptance in a rural, predominantly non-literate, low-income community, such a approach to non-hierarchical interaction usually proved fruitful. To provide examples: the researcher undertook tasks such as splitting bamboo, or carrying out actions such as crossing a

river on a bridge built of a single bamboo pole, which require skills and training embedded in local experience. Inadequacy or lack of dexterity was often a source of amusement to locals, demonstating the fallibility of the researcher and allowing a reduction in and temporary suspension of established social relationships, consequently permitting better acceptance and enhanced quality of interviews. Conversely, this approach could also accentuate power relations by emphasising differences and distinctness, and so it is limited in its application. To make it work, it has to be accompanied by more conventional interview skills such as the ability to present oneself as unassuming, unpretentious, non-threatening and amicable.

A way of overcoming bias in a small sample size in each project location appeared spontaneously: as in many other developing countries, especially in rural areas, the concept of a one-to-one interview is absent (Hershfield *et al* 1993, pp. 248-251). Neighbours and other project beneficiaries tend to be present during interviews, and almost all interviews with individual householders were conducted in such groups. Although having many advantages, including increasing the number of individuals spoken to, such group or community interviews also have disadvantages: if the main respondent is a female or not very articulate, other more vocal members of the community tend to dominate discussions. Mikkelsen (1995, pp. 107-108) and Slim and Thompson (1993, pp. 67-70) have noted some of the advantages and limitations of this type of community interview. According to them, and confirmed during fieldwork for this research, such interviews tend to work best in non-hierachical and fairly homogenous groups; the presence of powerful individuals or elites tend to introduce bias and inhibit responses from weaker members of the community. The researcher was conscious of such problems and attempts were made to overcome them. For example, during some interviews it was necessary to request accompanying agency fieldworkers or local influentials to leave (sometimes difficult and requiring excessive courtesy) so as not to bias responses of project beneficiaries. Fluency in the local language also facilitated interviews; as Mikkelsen (1995, p. 107) observes, it is a necessary qualification for such community interviews. Hershfield *et al* (1993, pp. 248-251), from extensive field experience, suggest techniques of maximising positive aspects as well as minimising bias in community group interviews; these were applied and found useful during fieldwork in this research.

As typical in PRA, involvement of community members and a diverse research team allows greater understanding (Theis and Grady 1991, p. 27). Research assistants were enlisted in Dhaka, prior to each field visit, and it was attempted in most cases to have a female assistant to facilitate discussions with female respondents. Additionally, in most locations it was attempted to also involve local agency fieldworkers and/or key informants in the group interviews/ discussions if it was clear that they would not bias responses. Thus there was a small and variable research team in each field visit, partly pre-planned, but also often formed according to the situation and possibilities of the location.

In each location, as well as beneficiaries of housing programmes, non-beneficiaries were also selected for interviews. Although more beneficiary than non-beneficiary households were chosen

because of the interest in investigating the effects of agency action. Of a total sample of 40 households, 11 were non-beneficiaries (27.5%). This categorisation is not consistent with those followed in the analysis of financing, implementation and housing design, the reasons for which are explained in respective chapters dealing with these aspects. The distribution of sample households according to locations, programmes and non-beneficiary status, as well as their profiles is shown in Appendix A.2., Tables A.2.1. and A.2.2.

3.3.2. Data collection methods

Because of the research design of comparative study of multiple cases in diverse agency programmes, it was decided that qualitative data analysis would be most suitable. This influenced data collection methods, resulting in the selection of small samples of households in relation to each programme for in-depth interviews and discussions. Interviews/ discussions comprised the main aspect of empirical investigation; hence they are discussed in some detail below. This approach to data collection, with an emphasis on in-depth interviews, is typical of most qualitative research (Hakim 1987, pp. 26-27).

As explained earlier in Section 3.2.2., to achieve triangulation, information on a similar set of issues was sought from beneficiaries of housing programmes, non-beneficiaries and agency staff members. Derived from the skeletal framework of inquiry presented in Chapter 2, Section 2.5., a checklist of topics considered to be pertinent and with potential for 'snowballing' into useful discussion were formulated. The topics were organised into questionnaire schedules, prepared to provide the similar questions to respondents in all three stakeholder groups. The answers assisted in revealing a wide range of attitudes and opinions, and also served as a reliable basis for comparison and for cross-checking to lend validity to the findings. Each schedule was divided into three sections, corresponding to the three main aspects of the housing process: financing, implementation and building design.

The interviews were only a part, though a major part, of a multi-method approach to data collection. In addition to the schedule or checklist of questions, which combined structured and, predominantly, semi-structured questions, focused observation, measured drawings, photographs and project documents/ publications by agencies were used. Data collection methods corresponded to some of the methods typically followed in PRA (semi-structured interviews, direct observation and review of secondary sources) (Theis and Grady 1991, pp. 42-43).

3.3.2.1. Interviews/Discussions: gaining rapport

Information was collected from different stakeholder groups through interviews and discussions. Structured interviews are generally associated with questionnaire surveys (Pratt and Loizos 1992, p. 54); in investigation for this research, such interviews would have been inappropriate because in addition to obtaining information on a range of issues, the intention was to identify possibly half-hidden factors such as attitudes, perceptions, level of skill, behaviour, social and household relationships. Such aspects are difficult to quantify and extensive discussions on a range of topics

were required in order to elicit responses indicating them. Thus the semi-structured interview was used to initiate comprehensive discussions. Gaining rapport with the community was highly important prior to interview/discussion sessions. Several days were spent in each location developing conditions for effective communication, quite often in the form of informal interaction with members of the community and households, during various hours of the day and in a variety of situations. This allowed for gaining understanding and collecting information also outside the parameters of the interview/discussion sessions.

To supplement interviews, narratives in the form of oral testimonies and life-histories were collected, a valuable form of data, especially to relate research to the perceptions of individuals whose views are not recorded or represented in literature primarily because of their non-literate or marginal social positions. Once again, to obtain these, it was important to develop rapport with household and community members by extended visits in each location and extensive informal interaction during this time, in addition to setting aside time for the somewhat formal interview sessions. Originally an intrinsic characteristic of ethnographic research, narratives have also contributed greatly to development studies (Slim and Thompson 1993; Pratt and Loizos 1992, pp. 55-58). Some of the narratives collected during fieldwork are presented as vignettes in the following chapters to illustrate certain points .

The semi-structured interviews were essentially a checklist of questions or points to discuss. This checklist of questions 'snowballed' and led to other questions during the course of the interview; many of the checklist questions were prompts for initiating and guiding further discussion. Questions often arose from the respondent's answers and also from the researcher's on-the-spot observations. Some questions were omitted if they appeared irrelevant during the interview. In these respects, the interviews were partly of the 'emergent' type described by Robson (1993, p. 149). Some of the guidelines for semi-structured interviews typically used in PRA (Mikkelsen 1995, pp. 75-76, 102-116; Theis and Grady 1991, pp. 52-60) were found particularly suitable for this research and have been adopted. A combination of 'the interview guide approach' and 'standardised open-ended interview' (Mikkelsen 1995, pp. 102-103) (see Table 4.2.) was followed, attempting to incorporate the strengths of both methods and safeguarding against their weaknesses by being aware of them. Semi-structured interviews were supplemented by a short structured interview, administered at the outset, to list basic demographic characteristics and household profiles. Interviews served as the primary source from which the results of the research could be established.

A note on the administered interview schedules: each interview schedule was divided into three main thematic areas of inquiry, as explained above. A specific set of issues within each thematic aspect was identified as important for investigation and within each of these issues a set of questions were posed, often as prompters for discussion. The thematic aspects, issues and questions have been assigned codes to facilitate analysis. Copies of the interview schedules are included in Appendix A.3. Although the schedules had been prepared and notes jotted in English

for the sake of this research, interviews were conducted in Bangla. The researcher's fluency in both languages proved useful, but to improve skills for this bi-lingual interview mode mock-interviews were rehearsed with research assistants prior to actual interviews.

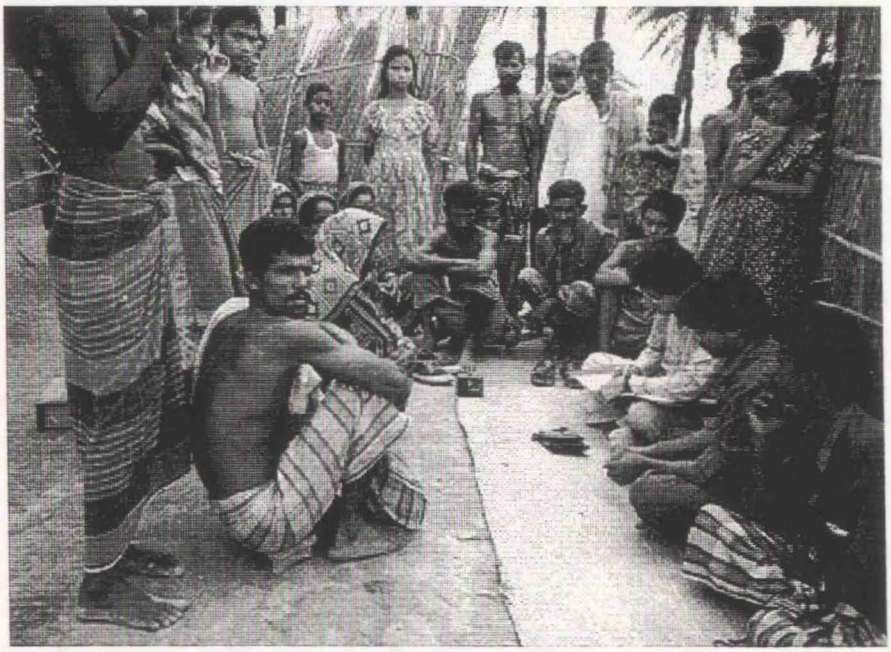
Table 3.2. Interview instrumentation types adopted in this research
(*excerpted from Mikkelsen 1995, p. 103*)

Type of interview	Characteristics	Strengths	Weaknesses
Interview guide approach	Topics and issues to be covered are specified in advance, in outline form; interviewer decides sequence and wording of questions in the course of the interview.	The outline increases the comprehensiveness of the data and makes data collection somewhat systematic for each respondent. Logical gaps in data can be anticipated and closed. Interviews remain fairly conversational and situational.	Important and salient topics may be inadvertently omitted. Interviewer flexibility in sequencing and wording questions can result in substantially different responses from different perspectives, thus reducing the comparability of responses.
Standardised open-ended interview	The exact wording and sequence of questions are determined in advance. All interviewees are asked the same basic questions in the same order. Questions are worded in a completely open-ended format.	Respondents answer the same questions, thus increasing comparability of responses; data are complete for each person on topics addressed in the interview. Reduces interviewer effect and bias when several intervieweres are used. Facilitates organisation and analysis of the data.	Little flexibility in relating the interview to particular individuals and circumstances; standardised wording of questions may constrain and limit naturalness and relevance of questions and answers.

To warm up to the interview and to serve as an 'ice-breaker', at the beginning a small structured questionnaire was administered regarding demographic aspects and household profile. Within this questionnaire, household income was inquired of at the end, since it is usually a difficult topic to discuss, both because it is sensitive and also because low-income rural households do not maintain accurate financial accounts. In some cases, attempts had to be made to inquire about income indirectly, employing a semi-structured mode, supplemented by observation and validated by group discussions; because of the low subsistence-income of most households, monthly expenses were usually considered as proxy indicators of income. Therefore the figures obtained for income are approximate estimates, rounded off to the nearest thousandth or hundredth figures. In semi-structured interviews on the main aspects, because the aspect of financing can often be sensitive, it was decided to discuss it towards the end of the interview. After the small structured questionnaire, interviews began with discussions on housing design, a relatively less sensitive topic; this worked well because the researcher was usually introduced to communities as an architect (or engineer, a common misinterpretation in Bangladesh), interested in design and construction. Then implementation was discussed, a slightly more sensitive topic, and finally, financing.

Interviews were undertaken with a sample of purposively selected individual respondents. Although the interviews were conducted mainly with individual heads of households, the opinions of other household members and neighbours were taken into account, to validate or triangulate information. This was done because, as mentioned, in the context of rural Bangladesh it is difficult, if not impossible, to conduct private individual interviews. The visit of an outsider prompts curiosity and it is usual for other community members and neighbours to be present during interviews and to volunteer information spontaneously, filling gaps and sometimes correcting responses of the main respondent. Thus most interviews were actually group interviews, also known as 'community meetings', relevant to a developing context, and affirmed by Mikkelsen (1995, p. 104) as 'the most widely used form of group interview in development projects and programmes'. However, since houses of individual households were studied, the head of household present during interviews was given predominance and presentation of empirical findings in subsequent chapters reflect this. Views of other community members were considered for cross-checking, validation and support of the main householder interviewee.

Fig. 3.3. Most interviews were 'group interviews' or 'community meetings'



To further avoid bias, within each case study, interviews were conducted with a selection of male as well as female heads of households. Appendix A.2., Table A.2.1. indicates almost equal frequencies of male and female respondents (52.5% male and 47.5% female, i.e. of 40 total households 21 are male and 19 female), done to achieve even representation within the sample. Attempts were also made to include some interviews with respondents of minority groups with religious backgrounds other than Muslim (the main population group in Bangladesh). Appendix A.2., Table A.2.1. shows inclusion of 20% Hindus and 5% Christians in the sample (two of the main minority groups in Bangladesh), again, for the sake of representation. All the respondents, however, were low-income rural inhabitants with a monthly income of Tk 5000 or less.

Most NGOs and other agencies in Bangladesh are involved in a variety of activities other than housing. Among the diverse staff employed within each NGO, are a few members who deal directly with housing programmes. These staff members were identified as key informants and for the purpose of this research were considered as the operational staff in housing programmes. Many

were identified during the preliminary/exploratory field visit. For each agency case study, interviews of relevant staff members were undertaken. Some staff members were in site offices in rural locations or in head offices in Dhaka. Most based in Dhaka had field experience in rural housing programmes or dealt with their management. Where possible, information was also cross-checked with agency fieldworkers.

During field visits, through informal discussions and interaction, information was also gathered from a range of agency fieldworkers, often possible because of extended visits and residence in project locations. Some of these fieldworkers were enlisted almost as part of a research team; often at the end of interviews with rural households, the researcher's notes or observations were compared with theirs, thus allowing personal biases to be rectified. To supplement information from households and agency staff members, a variety of building materials producers and suppliers were also interviewed. Such information was incorporated to increase reliability as well as to gain a broader range of perspectives.

As with most research projects, there were certain limitations: it was not always possible to obtain completely value-free data, and in the field it was sometimes necessary to make compromises on interview design. Nevertheless, the researcher was aware of these limitations and measures were taken later to amend or discard information of dubious or irrelevant quality. It was usually necessary to retire into a private room at the end of a day of interviews to review and check the information obtained and to make additional notes of observations still fresh in memory. This also presented the opportunity to fill gaps in note-taking during the course of the interview, often due to the uncontrollable momentum of discussions. Tape-recording community interviews did not present problems; thus it served as a valuable record for future reference. However, many agency staff members felt uneasy about the researcher tape-recording their interviews and thus it was abandoned. Because of the greater importance of community interviews in this research, it is believed that lack of comprehensive records of agency staff interviews does not present major obstacles.

3.3.2.2. Observation: gaining an 'insider' view

It was necessary to gain trust to be allowed access to homesteads and house interiors. The private nature of most rural homesteads does not allow observation to outsiders; for adequate observation it is essential to be treated as an insider, requiring trust of and rapport with household members. Two main aspects were observed during fieldwork. The first was observation of the condition of houses, which often indicated their performance and the economic position of the household. The second was observation of household members undertaking regular activities within the premises of their homestead and within the house. This allowed understanding of prevalent use patterns and adaptations to housing designs, at the same time such informal and extended visits to homesteads allowed developing rapport. Where possible, houses under construction were also observed, to witness the process and its associated characteristics; but because when the fieldwork was undertaken it was not the main building season, such opportunities were rare. The time of

fieldwork was chosen specifically to coincide with the summer and annual monsoons (rainy season). This is when villagers in Bangladesh face serious problems and the performance of housing is put on trial. Observation of the performance of housing and the coping mechanisms of household members at that time provided valuable insights. Additionally, it overcame what is known in PRA as 'dry-season bias' - the tendency for development workers/researchers to undertake field visits during favourable weather (Pratt and Loizos 1992, p. 66).

Observation was also carried out concurrently with the interviews during discussion of certain topics. This served to cross-check responses provided, since observation assisted in the formulation of new questions during interviews. At times, it was necessary to ask irrelevant questions to indicate general interest, thereby developing a rapport with respondents and enhancing their ease during interviews. Observation of different features in the homestead and its surroundings was necessary for this purpose. A continuous interview, relating only to the house, might have exhausted respondents and caused them to feel that the researcher was exploiting them only to elicit information. Many low-income rural households generally do not have sufficient time to spend on interviews; many of them are involved in arduous subsistence-level occupations. It was therefore often necessary to conduct interviews while household members were working in the homestead, simultaneously serving as a valuable opportunity for observation of use patterns and developing rapport. Sometimes it was found useful to conduct interviews with each respondent in several sessions, primarily in order not to exhaust him/her and also allowing for the opportunity to observe use-patterns and performance of housing at different times of the day or during different days, and again, gaining rapport by repeated visits. Breaks in interviews provided the opportunity to complete notes and check for missing information which could then be sought subsequently.

It was necessary to assess incomes of respondent households, because, as mentioned earlier, it was necessary that they had incomes within the defined range (≥ Tk 5000/month). In some cases, it became evident after detailed observation of indoor belongings and household articles that the household had a much higher income and interviews were then not pursued. People in general, and particularly those with a low income in rural areas of Bangladesh, are sensitive to questions about income. Therefore, along with indirect questions that assisted in assessing income, observation was employed. For example, the training manual for PRA mentioned above (Theis and Grady 1991, p. 49) suggests that observation of the type of house and its condition is often an indicator of income level. In the field, such observations of income, reliant on the researcher's judgement, were then supported by responses obtained in interviews.

As with income, age of respondents is also often difficult to assess because most low-income villagers, who are not literate, do not keep records of dates of birth. Sometimes, to assess age, it was necessary to relate it to important events to arrive at estimates; the researcher's judgement and observation was also brought to bear. Therefore, many of the figures for age shown in Appendix A.2., Table A.2.1. are approximate estimates.

3.3.2.3. *Measured drawings and photographs: documenting the undocumented*

In rural Bangladesh there is generally no tradition of producing drawings for house construction; therefore no drawings were available of the houses studied. Most of the agencies do have standard drawings of house designs for their projects, but beneficiaries had not always conformed to these or had modified the houses, or the designs were interpreted differently during project implementation. These divergences provide insights into agency-supported housing by identifying construction standards and differences in the agencies' agendas and beneficiaries' needs, and attitudes revealed in this regard by both parties during interviews. Hence, measured drawings had to be prepared and served as a useful record for subsequent analysis.

For each house, the plan and section, and relevant details, were measured. All the houses are single-storied and therefore one plan for each sufficed. The houses are generally rectangular in plan, with the roof pitch aligned towards the long side; therefore the section of the short side effectively indicates the height, and other necessary features. It was not necessary to draw elevations as the houses were photographed from the outside. However, it was necessary to take photographs of the interiors to record use-patterns and household belongings. Photographs of the setting, outdoor functions and people undertaking certain activities also highlight use-patterns. An extensive collection of photographs of housing and diverse aspects of rural life was assembled during the course of fieldwork. These photographs were later studied intensively and serve as a valuable reference. In addition, building materials, methods of construction, construction details and specifications (if any) were noted to obtain a complete record of house designs. The site plans were also documented, indicating important areas within the homestead, the spatial layout and the surroundings.

A set of these drawings, consisting for each house a plan, section, site plan and photograph of its exterior front view, is included in the Appendix A.5. In subsequent chapters, these drawings and photographs are utilised extensively to compare, illustrate and highlight specific aspects.

3.3.2.4. *Project documents and publications: subsidiary data*

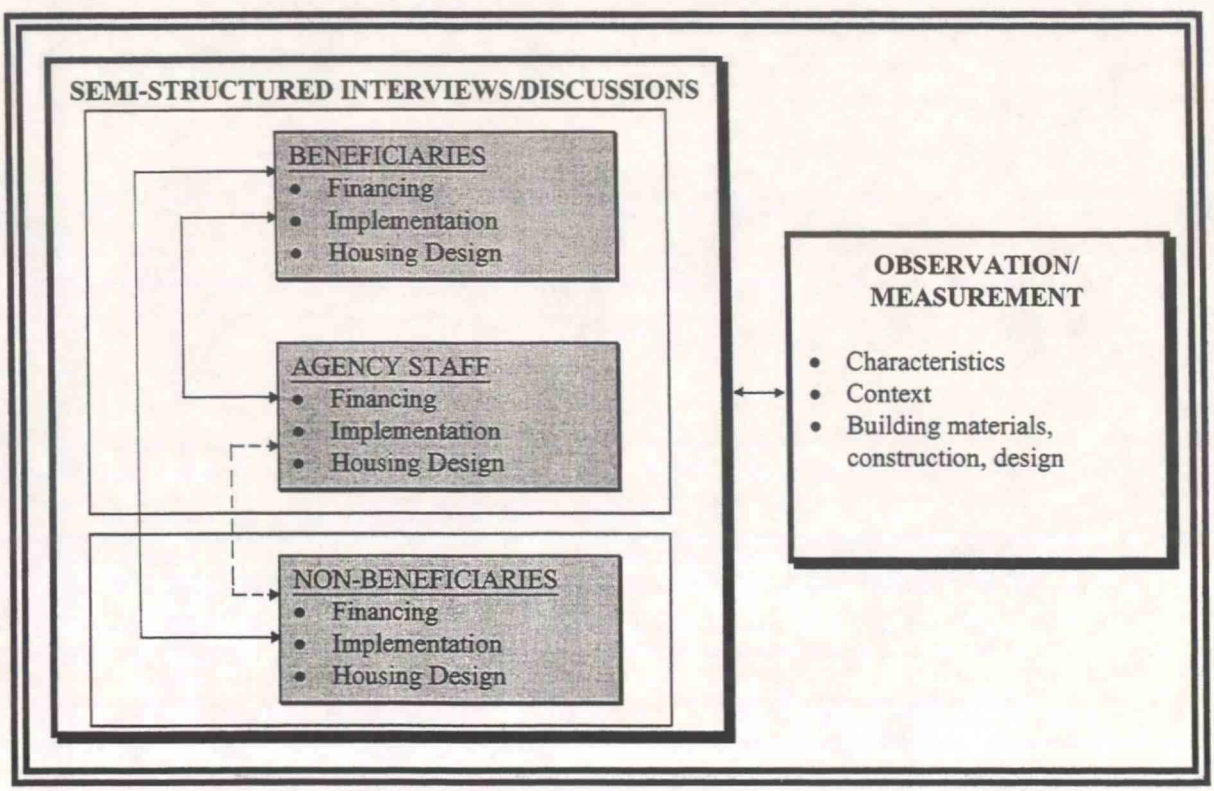
During fieldwork, mainly operational staff of agencies were interviewed; top-level administration and management staff were generally not interviewed. There were two reasons for this. Firstly, it is exceedingly difficult to meet higher officials, and even if it is possible, quite often they do not have time available for interviews of adequate length. Secondly, such officials are often not sufficiently knowledgeable about the details of housing programmes and project implementation; they tend to forward inquirers to staff members dealing specifically with housing programmes. As mentioned, most agencies carry out a range of programmes other than housing, and top-level staff members tend to be pre-occupied with these.

These observations were made during the preliminary/exploratory study, allowing for selection of suitable operational staff members for interviews and decision about an appropriate *modus operandi* for staff interviews for the main field study. Nevertheless, upper-level staff members

often had valuable information on general administration, objectives and agenda of the agency. Such staff are generally instrumental in the preparation or supervision of project documents; hence these documents to a large extent reflect their views. Thus collection of these documents proved to be a useful secondary source and most agencies were forthcoming in providing access to their documents. Some of these documents were prepared in the form of publications for public circulation and hence were readily available. Project documents and agency publications of housing programmes provide drawings, specifications and other details of house design. These allowed comparison between housing designed by agencies and modifications undertaken by beneficiaries and interpretation in the field. Supplemented by interviews, this comparison was an important aspect of analysis. However, this source of information was given less priority because of problems often associated with acquiring 'grey' literature which agencies might not desire to divulge and also because this study is concerned primarily with views of rural communities, not so much with policy evaluation.

In addition to agency publications and project documents, a variety of literature relevant to the concerns of this research is available in Bangladesh, often not possible or difficult to obtain in the UK. Publications on development issues in Bangladesh and national statistics are examples of this. Both the preliminary/exploratory field study and the main study provided opportunities for collecting such publications, supplementing previous literature review.

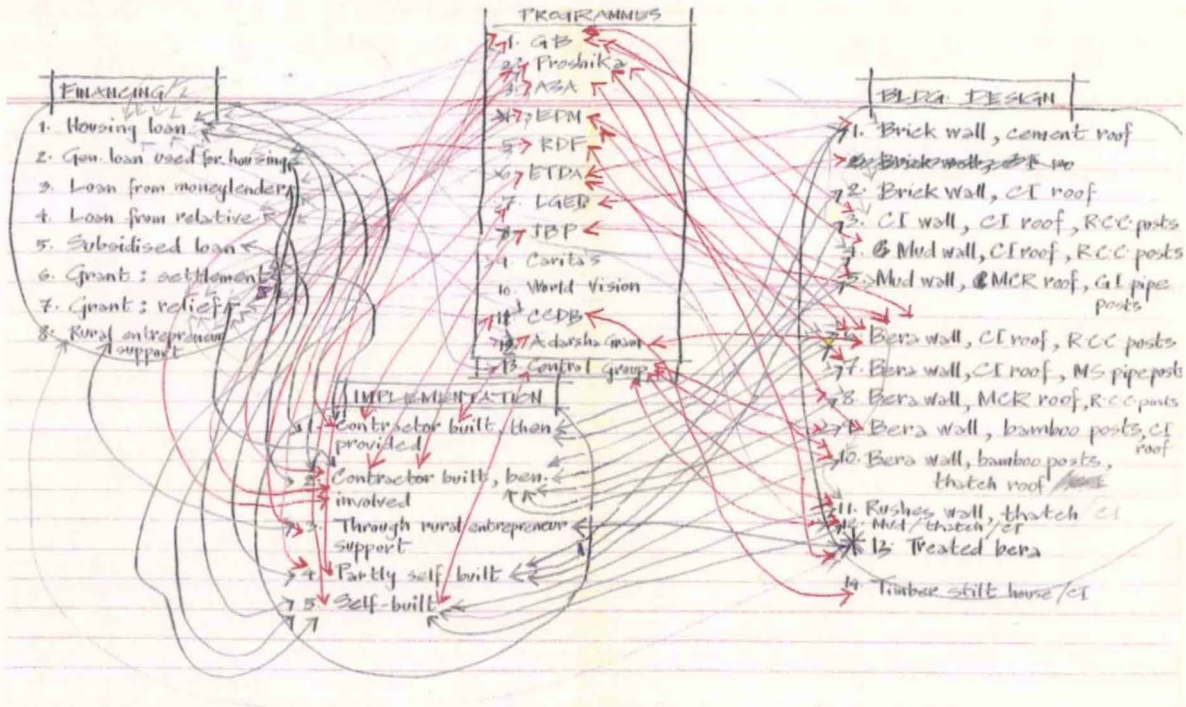
Fig. 3.4. Conceptual framework of empirical investigation



3.4. ANALYSIS OF EMPIRICAL FINDINGS

In this research, derived from PRA methods, analysis is conceived of not only as a post-data collection activity, but also as an ongoing activity in the field (Mikkelsen 1995, p. 82; Theis and Grady 1991, p. 139). Authors writing more generally about data analysis, especially qualitative data, advocate such a strategy instead of leaving analysis for later (Miles and Huberman 1994, p. 50; Robson 1993, pp. 305, 375). This is certainly sensible, contributing towards not becoming confused by data overload (a common problem in qualitative research) through collecting irrelevant data and hence also economising on time. Fig. 3.5. shows an example of analysis during fieldwork, indicating an earlier stage of the analytical framework subsequently adapted and refined through an iterative process.

Fig. 3.5. Example of early analysis during fieldwork



The basic approach to analysis is comparison of individual households as well as a cross-case analysis of agency rural housing programmes. Because of methodological obstacles in merging these two approaches, a common problem observed by other researchers (Mikkelsen 1995, p. 115), a strategy to overcome that was adopted. Categories and issues from the cross-case analysis were first identified to delineate an analytical framework; within that, agency cases and individual households were utilised to highlight specific aspects, describing and explaining processes, perceptions, interactions and relationships in programmes and general approaches relevant to the housing process.

An overview is provided below of methodological approaches and strategies to the analysis of findings of fieldwork, and specific analytical features germane to each of the thematic aspects comprising the housing process - financing, implementation and housing design - are discussed.

These three aspects are each presented in a subsequent individual chapter, where the analytical findings are discussed in detail.

3.4.1. Merging qualitative and quantitative approaches

The debate about and applications of qualitative and quantitative research is extensive in literature on social science research methods. Although such literature was consulted, it is not considered here in detail, because of the exhaustive nature of its scope and because the subject has been so well covered. One may refer to Mikkelsen's list (1995, pp. 225-228) of general and typical characteristics of qualitative and quantitative methods in development practice and research to find a comparative overview of essential features of both these methods.

The primary approach in data collection and analysis is qualitative, because of the nature of the research problem and questions and some quantitative data was also collected. Some of the qualitative information is transformed into quantitative form for the sake of analysis. In development research, as well as case study-based research, this mixed approach has been suggested by several authors (Mikkelsen 1995, p. 115, 229; Robson 1993, p. 304; Rubin 1995, p. 50), since it utilises advantages inherent in both approaches. Although potentially confusing and possibly leading to difficulties, such a plural approach was found advantageous in this research to highlight different dimensions of an issue.

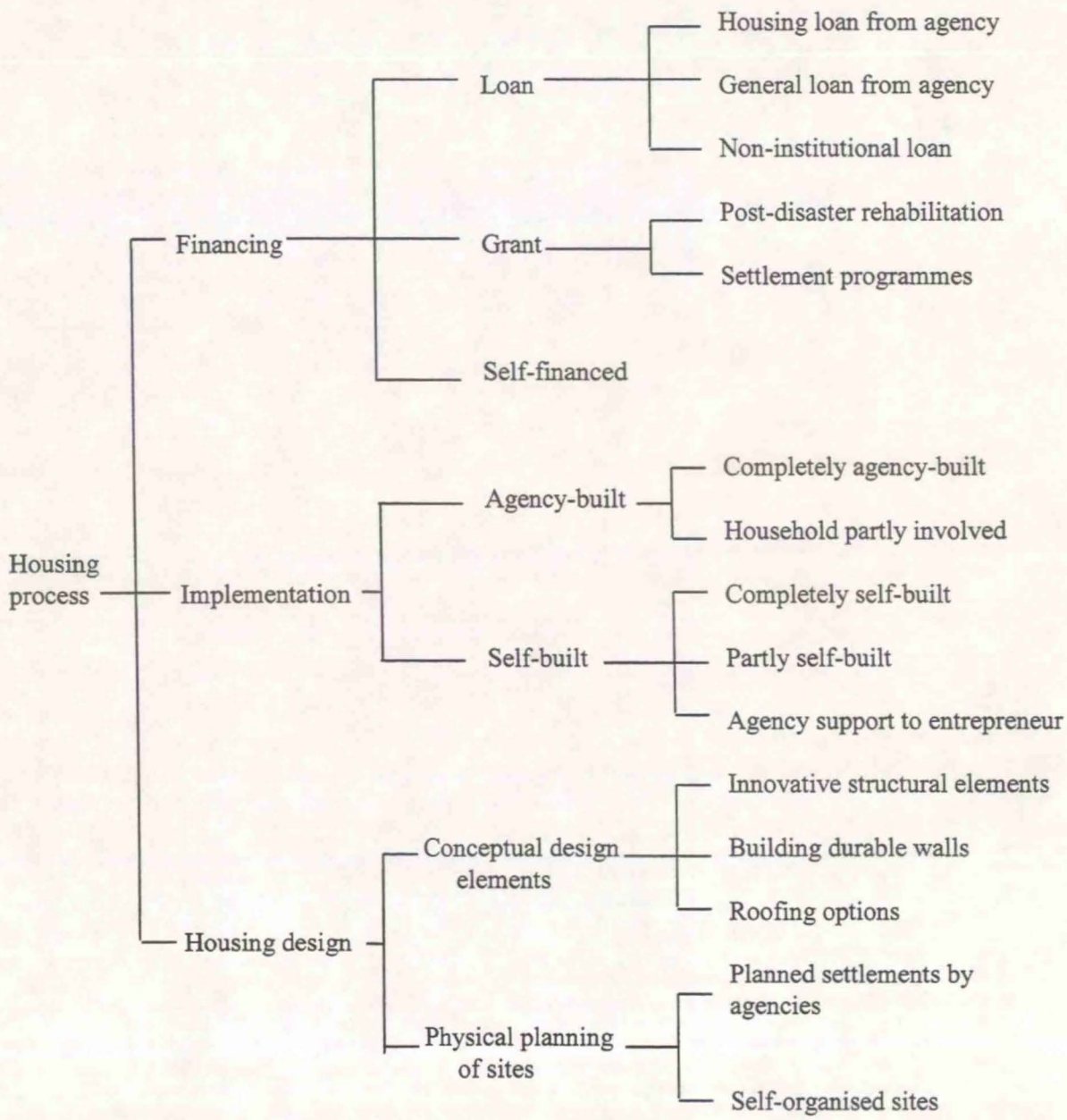
To do this, specific categories within each of the thematic aspects dealing with the research sub-questions were formulated, reflecting programme types and approaches recorded during empirical findings; they are then qualitatively compared and discussed. In this qualitative discussion, agency programme case studies and sample households are utilised to illustrate and highlight specific points relevant to housing efforts, somewhat akin to journalistic discourse, and often done in case study-based research (Yin 1994, p. 15). Narratives and vignettes of informants and respondents provide a valuable aspect of qualitative study; the inclusion of such 'oral testimonies' in studies of development projects, illustrated by specific examples in Slim and Thompson (1993, pp. 57-60), enhances the quality of the study greatly by providing a complete picture. The categories within each thematic aspect are then compared by statistical tests utilising quantitative data collected during fieldwork or coded from available qualitative data. The results of these tests are then interpreted, not only in quantitative terms, but also qualitatively, relating to some extent to earlier qualitative deliberations. This analysis on two levels highlights different dimensions of the thematic aspects and allows a broad perspective and insights into the nature of agency action. How this is done with each thematic aspect is discussed below and also in subsequent chapters dealing with each of these aspects.

3.4.2. Analysis of qualitative data

Each of the main thematic aspects was coded initially during fieldwork, according to findings in the field, and then refined subsequently. Financing is categorised into three types: loan, grant and self-financing, and implementation into two types: agency-built and self-built, with respective sub-

categories. Within these, certain issues (to an extent common to all the sub-categories) were identified for analysis. This categorisation within these two main aspects is a comparative approach relating to the research design discussed in Section 3.2.2. For housing design, the coding differs: analytical categories consist of conceptual design elements in agency-built housing and physical organisation of sites, with their own sub-categories. The comparative approach is instead followed within these categories, and specifically in the second category, through its sub-categories. This is done because some of the design and construction aspects of self-designed housing have already been discussed in Chapter 2; it is necessary instead to elaborate upon, in more detail, characteristics of agency-designed housing. Fig. 3.6. displays graphically the branching out pattern of the analytical framework derived from this categorisation and coding.

Fig. 3.6. Analytical framework derived from categorisation and coding



Initially, a set of themes, each with a set of questions, based on the interview schedules, was formulated for analyses of each of the above sub-categories. Households were included according to their fit in each category, and analysed according to their responses to these questions, in a process of 'literal replication' (predicting similar results) (Robson 1993, p. 379; Yin 1994, p. 46). This analytical structure is shown in Appendix A.4.1. and the main themes for each aspect of the housing process are presented in the introductions of the following chapters. An analytical summary of individual cases was prepared according to questions relating to the themes, and a database was created to file all responses to each question, to facilitate sorting, retrieval and comparison of the variety of responses to each question. The Mail Merge sub-menu in Word V6 for Windows was utilised to create the database. A part of that database for two households and their summaries are shown in Appendix A.4.2.

Although used to a large extent when writing about financing in Chapter 5 (the initial analytical chapter), this analytical method was subsequently found too unwieldy for individual management by the researcher and was abandoned. Nevertheless, it should be pointed out that for a large-scale study with a research team including assistants for inputing extensive data into the computer, this method might prove worthwhile and potentially useful. For this research, with its smaller scope and lesser resources, a different method had to be adopted. The questions and themes were retained, but not adhered to strictly. Instead, a manual method, consisting of reviewing and preparing summaries of household and agency staff responses within sub-categories of each main aspect (or research sub-question) was adopted. These summaries were then colour-coded manually, mostly according to the themes; if new themes arose, these were assigned separate colour codes. This proved more flexible as it was possible to include new unpredicted themes, difficult in the former database approach. Comparisons were then carried out according to the individual colour code, enabling formulation of a structure for writing and preparing written drafts about each sub-category. Once drafts for all sub-categories of each main category were prepared, they could be reviewed collectively, enabling preparation of the text for each chapter. To demonstrate this manual analytical method with its colour coding, an example is provided in Appendix A.4.5., showing the colour coding scheme for themes and the structure for writing about the sub-category of completely agency-built housing within the main category of agency-built housing, related to implementation. This is illustrated by summaries of a household's and a related agency staff member's interviews.

Vignettes and narratives to highlight and illustrate particular issues are included in the analysis. Where necessary, quotations from interviews are presented. Although tape-recordings were not transcribed and utilised mainly as a back-up for interview and field notes, they proved a valuable source of quotations. During interviews, when writing complete notes became difficult, or a particularly important and potentially quotable comment was heard, a note for later reference to the tape-recordings was jotted down in the relevant section of the interview schedule. As evident in the following chapters, each quotation or narrative from a householder is attibuted to a respondent who is identified by a somewhat altered name (to protect privacy of respondents); a list

of names of all household respondents, including relevant profiles, is provided in Appendix A.2., Tables A.2.1. and A.2.2. Names of agency staff members are withheld because of the possibility of impairing job-security by their exposure. This presentation of analytical findings is located between the extremes at one end of edited presentation of transcribed interviews with the researcher's analysis in a separate section, and at the other end, occasional references to interviews in more theoretical and interpretive studies (Hakim 1987, p. 34). This middle way has been found more suitable for this research because of its orientation towards research methods derived largely from the human sciences (ethnography, PRA) for the study of a specialised, and to an extent, technical topic.

Analysis was supplemented by continuous literature review. Instead of the typical approach of dedicating only the early part of a research project to literature review, it was found useful to consult texts relevant to each specific aspect during its analysis, relating empirical findings to literary evidence as a constant check on the consistency or divergence of empirical findings with other sources, as well as of whether the findings were contributing new knowledge to the field.

Two methods, somewhat sequential [although Yin (1994, p. 110) has suggested that they are two separate and distinct approaches, here they have been adapted as partly, but not completely, sequential], and typically followed in qualitative research - pattern-matching and explanation-building - were adapted for this research and interpreted according to its needs (Robson 1993, pp. 378-381; Yin 1994, pp. 106-113). To simplify, pattern-matching begins at the earlier stages of analysis, often during data collection and in an exploratory manner, and continues through later stages. Accompanied by sorting data for manageability and comprehensibility, dominant themes, patterns, relationships and recurrences are identified. Meaning is then attributed to these and explanations induced, and causal relationships are also detected. Such a process is evident in the analytical method adopted.

3.4.3. Analysis of quantitative data

Within each of the main thematic aspects some data was collected in quantitative form or is amenable to quantitative analysis. Data such as the number of houses built by programmes, repayment, default and interest rates of loans, numbers of project beneficiaries, cost comparisons of building materials and spatial measurements are utilised to supplement the qualitative analysis. For example, in the case of financing, the distribution of the cost of houses and personal investment by households in comparison to incomes are displayed graphically in charts within the formulated sub-categories explained in the preceding section on qualitative analysis. Such quantitative data is embedded within the qualitative analysis to enrich and enhance the analysis and arguments presented. House cost comparisons are covered when discussing financing, but more detailed quantitative information on cost comparisons of different building material options are an indispensable component in analysis of housing design, especially because of the limited resources of Bangladesh and the study population.

In addition to the embedded quantitative data, for each of the main aspects some basic comparative statistical tests are carried out, almost as an addendum to the qualitative analysis. Because of the qualitative orientation and emphasis of this research, the quantitative tests are included primarily to strengthen qualitative findings and do not purport to establish prime conclusions. The statistical computer package SPSS Windows V6 was utilised for these tests. Although the nature, utility and purpose of these tests are discussed in detail in relevant sections of the following chapters which deal individually with each aspect, a few salient points deserve mention here.

In financing, three main variables were chosen for testing statistically: total cost of house, household monthly income and personal investment of funds by household in house construction. It was possible to obtain data in numerical form for these variables during fieldwork. Correlation between these variables is tested first. This indicates whether within the research sample of 40 households significant relationships exist between these variables, providing an insight into housing finance mainly in terms of affordability. The two main categories of financing - loan and grant - represent two basic approaches to financing by agencies; treating them as independent groups, they are compared according to the three main variables, which are also independent. For this, the independent samples t-test is utilised [Robson (1993, p. 353) explains the basis for the choice of this test; Fink (1995, pp. 63-65) provides basic details]. By interpreting results of the tests, understanding is gained of the effectiveness of each category of financing. Because of the small frequency ($n = 6$) of the third category of financing - self-financing - it is not compared statistically with the other two financing categories. Nevertheless, means and standard deviations of self-financing according to the three variables are displayed in tables and charts, alongside the other two financing categories to enable rough comparisons and to indicate rudimentary patterns.

When analysing implementation, two variables were selected for comparative statistical tests: household preference for type of implementation and replicability of house design in the local context. The two main categories of implementation - agency-built and self-built - are compared, according to preference for them by the research household sample, and replicability of houses within these two categories. Whether a relationship exists between preference and replicability is also tested. These tests provide additional insights into housing mainly in terms of approaches to implementation. Because data for these variables was not available in numerical form, they had to be coded in categorical (or nominal) form for quantitative analysis. This suggested cross-tabulation using the Chi-square test (Fink 1995, p. 51).

For reasons mentioned earlier, qualitative analysis of housing design is largely not analysed according to a comparative approach (only site organisation is compared between beneficiary and non-beneficiary groups), but when analysing quantitatively, such a strategy was followed because it presented the opportunity for an additional insight. Accordingly, agency-designed and self-designed housing is compared in statistical tests, and two variables are selected for that: durability and size of house. Because data for durability could be coded only in categorical form, cross-

tabulation using the Chi-square test was undertaken for comparing durability of agency-designed and self-designed housing (Fink 1995, p. 51). On the other hand, because houses were measured during fieldwork, house size was available in numerical form in terms of floor area. Therefore comparisons of house size are done using the t-test. Relationship between durability and size is also investigated and because of the availability of numerical data for size, a t-test is used for that (Fink 1995, p. 51).

In addition to the above statistical tests in analysing individually the three main aspects of financing, implementation and housing design, a number of tests are carried out to draw conclusions from an analysis of the inter-relationship between the three main aspects. This is discussed below.

Table 3.3. Basis of quantitative analysis

Thematic aspect	Categories/Types	Variables	Statistical tests
Financing	• Loan • Grant • Self-financing	• House cost • Household income • Personal investment by household	• Correlation • T-test
Implementation	• Agency-built • Self-built	• Household preference for implementation type • Replicability of house	• Cross-tabs: Chi-square
Housing design	• Agency-designed • Self-designed	• Durability of house • House size	• T-test • Cross-tabs: Chi-square

3.4.4. Drawing conclusions from analytical findings

The above sections present the methods followed for analysing individually the three main thematic aspects - financing, implementation and housing design - set out in three separate chapters following this chapter. These relate to the three research sub-questions articulated in Section 3.2.4. on research questions, and answers are attempted to them. Although they provide illumination with regard to each of these important aspects comprising the housing process, they do not provide a complete picture. Therefore, when drawing conclusions towards the end of this study, inter-relationships between these aspects are investigated, to provide insights into how the three research sub-questions relate to each other. Additionally, and as a final attempt to establish links, the relationships of the sub-questions to the main research question are examined; this allows conclusions providing answers to the main research question, the quintessential concern of this research.

To investigate these relationships, firstly the three main aspects are examined with respect to each other in sets of two, that is, financing and implementation, implementation and housing design and financing and housing design. To do this, comparative categories of housing for each aspect are established, including agency-financed and self-financed for financing, agency-built and self-built

for implementation, and agency-designed and self-designed for housing design. Then frequency distributions of households (or the research sample) according to these categories in each set (of two aspects) are examined. These distributions begin to suggest relationships, which are then utilised to draw a set of conclusions in the light of wider qualitative findings. Similarly, when seeking to derive conclusions regarding the main research question, a matrix is prepared, consisting of frequency distributions of the research sample for all the combinations of the categories of the three main aspects. Once again, these combinations suggest certain trends and relationships, allowing a set of conclusions about the overall nature of effectiveness of housing studied in this research to be established.

The variables within each aspect mentioned above are also tested statistically across the aspects to supplement previous tests within each aspect. Fink's (1995, pp. 51-52) guide to choice of statistical tests was consulted. Because the nature of data remains the same, the same tests - correlation, cross-tabulation using the Chi-square and independent samples t-tests - are carried out. These tests provide an additional dimension to the conclusions. Drawn out of empirical findings which delineate the current position of low-income households with regard to their housing situation, the conclusions point towards implications of this study for financing, implementing and designing low-income rural housing. They also point to broader links and suggest avenues for further study.

3.5. CONCLUSIONS

Low-income rural communities in Bangladesh are increasing subject to a variety of developmental interventions, including housing. However, especially in the field of housing, there are hardly any studies that represent the voices of these communities; they lack suitable media for expression of their views and often vehicles for their representation are absent. This is the basic premise of this research, pointing to research methods and questions chosen to represent primarily a micro-level view of the low-income rural community in Bangladesh. To obtain this view, developing rapport with rural communities was a fundamental requisite, reflected in the nature of research methods chosen for this study. Although mainly an academic research exercise, it is hoped that the methods adopted here will result in demonstrable utility.

New schools of thought in the form of the 'participatory' paradigm have emerged in recent years in response to the need for represention of low-income communities in development programmes, and there is growing awareness of this paradigm. Thus it is worth exploring whether methods pertaining to this paradigm are useful for research with similar concerns. Extrapolating the tenet of PRA, a 'basket of tools' for data collection and analysis (Theis and Grady 1991, pp. 42-43), it is well worth acquainting oneself and adopting techniques and approaches from other types of research in addition to PRA. This allows innovation and concoction of a hybrid of approaches suitable to the specific research needs and background of the researcher. As any prundent mechanic aspires to possess an extensive collection of tools, to tackle unforeseen problems which

might arise, using specific tools as required by particular circumstances, so should a researcher endeavour to assemble a range of research methods.

The research methods for designing a research strategy, collecting data and its analysis in response to a main research question and a set of derived sub-questions have been presented in this chapter. This serves as a preamble to the detailed analysis of each of the three main aspects appertaining to the sub-questions, carried out in the following chapters, leading to establishing their inter-relationships and relationship to the main question, consequently providing answers to it in the form of conclusive findings and implications of this study.

• *CHAPTER 4*

FINANCING

4.1. INTRODUCTION

In Chapter 2, a variety of problems in rural housing was outlined, indicating their linkages to limited financial assets, hazard vulnerability and diminishing natural resources. It was argued that the financing mechanism for house building is important, especially given the low economic profile of a large majority of rural households. The importance of this essential aspect of housing led to the formulation of the first derived question:

> **How far does the mechanism of providing or acquiring funds for house construction and maintenance by low-income rural households meet expectations and needs of the stakeholders?**

This question is examined in detail in this chapter and a variety of financing mechanisms, both those of agencies and those adopted by households on their own, is discussed, to develop a complete understanding of the range of mechanisms. To explore this range, twelve geographically dispersed housing programmes were studied in the field. These differed greatly in terms of scope and intent, but had the common aim of providing housing to low-income rural households. Discussions were held with selected beneficiaries of these programmes and their staff who were operational in programme implementation. In addition, discussions with households in the vicinity of each programme that funded house construction by themselves, or with funds from non-institutional sources, were undertaken.

It was necessary to obtain as accurate an economic profile of households as possible, because in a general context of impoverishment a small difference of income could amount to significant qualitative differences between economic conditions of households. Ownership of agricultural land is a significant factor in indicating economic condition, and this has been used to a large extent as a differentiating factor. However, non-farm activities are increasingly becoming an important source of income for households who do not own agricultural land, and where applicable, this has also been taken into account.

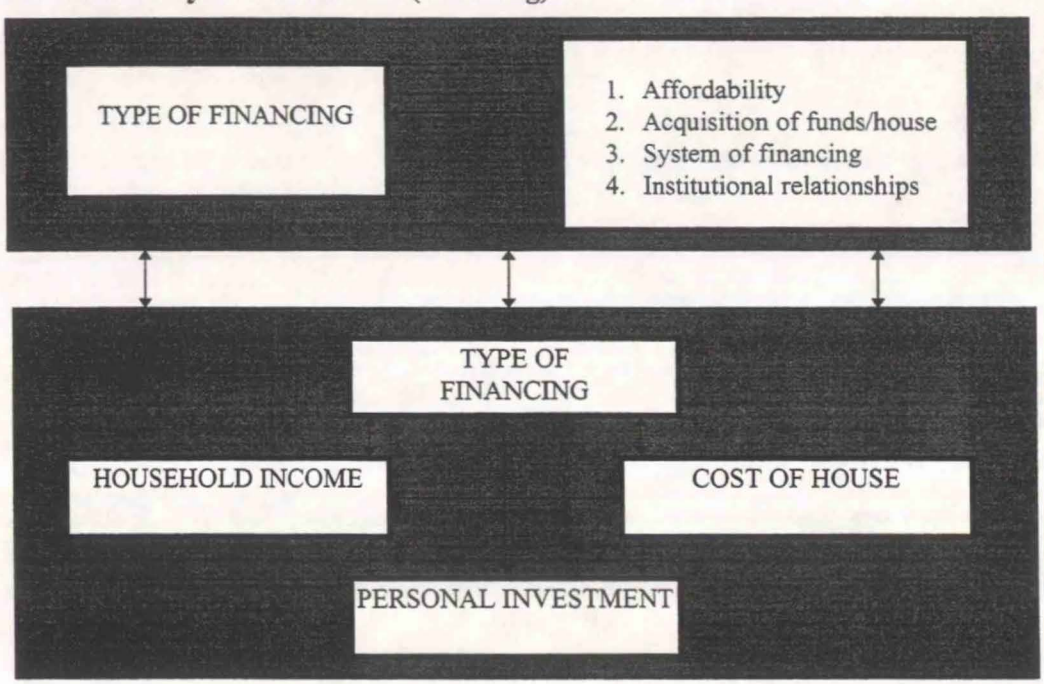
Household income can sometimes be a sensitive topic; often households are reluctant to offer honest information in this regard. Thus an indirect method, as explained in Chapter 3, Section 3.3.2.1. when discussing interviews/discussions, circumspecting the topic and thereby attempting to gain as accurate an assessment of income as possible, was adopted (see interview schedules in Appendix A.3.) and often household monthly expenses were used as proxy indicators of average monthly incomes. These methods were further supported by observation of household status, indicated by the condition of house and homestead, belongings and other signs. Various studies use this method of observing household appearance to assess income in addition to personal

inquiry (for example, see Maloney and Ahmed 1988, pp. 14-15; Theis and Grady 1991, p. 49). Within the limits of this study it was not possible to research in detail other factors, such as socio-political connections within the rural class hierarchy, that nurtures indirect economic support to low-income households, although they may have provided greater insights into non-monetary household resources. The status of households, essentially within a class structure, constitutes a topic of research on its own (e.g. White 1992). For this research, evidence of income, gathered in the field, can be assumed to be moderately accurate, and as the discussion in this chapter is about income mainly in relation to house construction and not household income *per se*, detailed specifics are unnecessary.

However, it was also necessary to obtain accurate information on house cost, cost of building materials and components. Where not possible to obtain this information from households, it was elicited from project documents and discussions with programme staff. House cost was analysed with respect to investment of personal funds by households in construction, an important criterion to assess affordability and the economic position of households.

The analysis in this chapter is conducted on two levels. Firstly, different types of funding are qualitatively discussed and compared. Secondly, understanding is developed by examining quantitative relationships between the aspects mentioned above: type of funding, cost of house, household income and personal investment. There are four main topics that provide a framework for qualitative inquiry and analysis within each funding type: affordability, acquisition of funds, system of financing and institutional relationships. This framework is implicit and not referred to directly in the text; it has nonetheless served as a guide to analysis. Appendix A.4. gives details of this guiding framework. The chapter concludes by outlining the implications of findings established in this chapter on other topics in this research.

Fig. 4.1. Basic analytical framework (financing)



4.2. TYPE OF FINANCING

During field investigation discussions were held with forty households. Because of the interest of examining agency-supported new housing strategies, a larger proportion of the sample consisted of households that had benefited from agencies. The basic data on this household sample is presented in Appendix A.2., Table A.2.1., also showing the numbering sequence adopted. This numbering of households (HH) has been followed throughout the text and also when categorising according to funding systems, shown below.

Table 4.1. Categories of financing systems

TYPE	SUB-TYPE	HH NO.	NO. OF HH	%
Loan	Loan from agency	1, 2, 3, 8, 9, 13, 14, 18, 20, 26, 27, 39	12	**30**
	General loan from agency	5, 7, 25, 38	4	10
	Non-institutional loans	15, 10, 31	3	7.5
Grant	Post-disaster rehabilitation	6, 21, 22, 23, 24, 29, 30, 32, 33, 40	10	**25**
	Settlement programmes for the landless	11, 12, 34, 35, 37	5	12.5
Self	Completely self-financed	4, 16, 17, 19, 28, 36	6	15
		TOTAL	**40**	**100**

During field investigation it was found that there were two main types of institutional funding for house construction - loans and grants - with a number of approaches within these main categories. Two main approaches, one in each main category, were preponderant, reflected by the large number of cases included in each approach (see Table 4.1.): loan from agency and post-disaster grant housing. A number of households who financed house construction on their own were studied to arrive at a basis for understanding the advantages and disadvantages of funding by agencies compared to indigenous, local modes of funding. A frequency count of the main funding types covered in this research is provided below.

Table 4.2. Frequencies of main empirical funding types

TYPE OF FUNDING	NUMBER OF CASES	PERCENTAGE (%)
Loan	19	47.5
Grant	15	37.5
Self	6	15.0
TOTAL (N)	**40**	**100**

4.3. LOAN: CREDIT FOR LOW-INCOME HOUSEHOLDS

Extending institutional credit to low-income rural households has been widely discussed in development literature, especially since the inception of the Grameen Bank (GB) (see Box 4.1.). In Bangladesh, and also in other countries, the GB model has been replicated, and a large number of

other rural credit programmes has developed, causing further proliferation of the literature on credit. It is quite extensive, as is the number and type of credit programmes, and this is not the place to discuss them in detail. To cite a couple of examples briefly: BRAC (Bangladesh Rural Advancement Committee), one of the larger and older NGOs, is depicted by Chen (1985) as having a transformative effect on rural women through its credit programme; Sobhan (1997, p. 37) presents ASA (Association for Social Advancement), another large NGO, as an example of policy shift from collective action to credit provision. As a result of this discourse, an image has evolved of low-income rural households as recipients of institutional credit in the absence of other acceptable sources of credit. Institutional credit is promoted as the ideal developmental paradigm, and indigenous credit sources, exemplified by the village moneylender, have been discredited as exploitative, with high interest rates (for example, see Fuglesang and Chandler 1993, pp. 20-21). However, some of their advantageous aspects tend to be overlooked and the diversity of local and indigenous credit sources are not taken into consideration.

Loans specifically for housing for low-income households are less discussed in the literature. This can be attributed to a number of reasons. Firstly, the basic intent of most institutional credit is to support entrepreneural activity, for which credit is viewed as recoverable capital input. This preoccupation with recovery is illustrated by literature on the GB which inevitably refers to its high loan recovery rate. The quantitative record of recovery is taken as a measure of success of the programme, since it shows success as reflected in the ability to repay, without sufficient consideration of qualitative aspects of loan utilisation. On the other hand, housing in the Bangladeshi rural context approximates to a consumption item, generally signifying a risky credit venture in terms of recovery; hence most credit programmes do not provide loans for housing or allocate comparatively few loans for it. The GB, despite a much smaller allocation of housing loans compared to general loans, is one of the largest providers of rural housing loans in Bangladesh. Possibly because of this extensive engagement, the GB's promotional literature contests the notion that rural housing is a consumption item. It suggests instead that the house is also an economically productive item because it is often a workplace, supplementing the ability of households to generate home-based income, as well as safeguarding the health and hence efficiency of individuals (Barua 1999, p. 89). However, no systematic research has been undertaken to indicate that the house has significantly enhanced the income generation capacity of the majority of GB beneficiaries. In fact, on the contrary, it has been observed that enterprises conducted from within the house generally utilise less than 10% of loans disbursed for major entrepreneurial activities of the predominantly female borrowers of the GB (Rahman 1994, p. 15).

Despite the GB's portfolio of high recovery rate for housing loans as well as other types of loan, other programmes have had minimal success in recovery of housing loans. If two of the largest NGOs in Bangladesh - Proshika and BRAC - are considered, BRAC no longer has a housing loan programme and Proshika has discontinued its housing programme after poor recovery performance. The government's experience in this field has been minimal - a few small pilot projects, beneficiaries of which have generally defaulted. Concurrently, there are also local and

non-institutional sources of credit prevailing from much earlier than the advent of institutional credit. Loans and the variety of loan types are discussed below, utilising specific case studies as illustrative examples.

4.3.1. Loan from agency

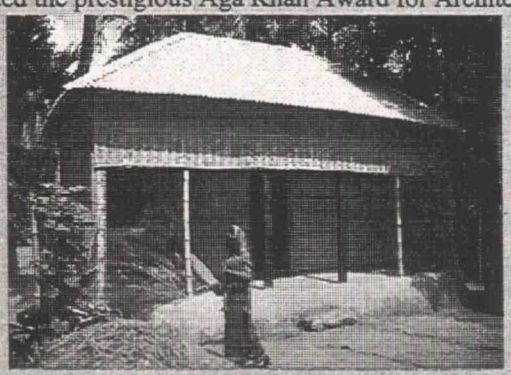
The credit programme of the Grameen Bank (GB) is the most extensive and well-known one, and hence this section deals substantially with it. It should be mentioned that there are two different implementational methods of housing loans: the GB type, where cash and some building components are disbursed to beneficiaries to build their houses, and the other type, where houses are built and provided to beneficiaries and the cost recovered by periodic instalments. These methods are discussed in detail in Chapter 5; here both these methods have been included in the general category of agency loan.

4.3.1.1. The Grameen Bank model

Box 4.1. The Grameen Bank Rural Housing Programme

An action-research programme which started as an experiment in 1976 to extend collateral-free credit for income-generation to the rural poor proved successful and was institutionalised as the Grameen Bank (*grameen* means rural in Bengali) in 1983. The basic concept is to form groups of five to eight members, with loans disbursed through peer guarantee. This concept has proven quite effective in terms of loan recovery. The bank gradually became concerned with the problems of the rural poor in providing housing for themselves and began an additional programme to provide house building loans to its members in 1984.

It was understood by the bank that the diminishing supply of building materials and the consequent rise in prices had rendered house building and maintenance a generally expensive and unaffordable enterprise for a large section of the rural population. It began to be recognised that the poor lacked lump-sum capital to build houses, but were possibly able to repay in gradual instalments in a way similar to that for the general loans for income-generation which the bank had been forwarding. The great floods of 1987 and 1988 caused widespread and extensive damage to rural housing and the GB responded by expanding and improving its housing programme. From 1984 to 1989 the bank financed 44,500 houses, and by the end of 1995 it had been able to finance 331,201. As with its general loan programme, the repayment rate has been nearly 100%, and the great majority of beneficiaries are women. It is also possible to buy homestead land through a loan before building a house, and in that way the bank attempts to address the issue of accessibility to land as well. The points noted above and further related information on the GB have been extensively covered in various development literature, official documents and, more recently, on the internet (GB annual reports and monthly bulletins; Grameen Dialogue newsletter; Barua 1999; Aga Khan Award for Architecture 1989 project documents, summarised in *Mimar* 33 1989, pp. 19-21 and in Aga Khan Trust for Culture 1995; etc). In general, the bank has been cited widely in development literature as providing an innovative and successful example of rural development based on credit provision (Crump 1991, pp. 114-115; Haq 1997, p. 97; Kabeer 1995, p. 111; Teare 1997, p. 43; UNCHS 1991, pp. 38-45; Wheat 1995, pp. 24-25), has been replicated in several other countries (Rahman 1994, pp. 19-23, 25-27; Grameen Dialogue 14 1993) and its housing programme was awarded the prestigious Aga Khan Award for Architecture in 1989.



Because of the predominance of the GB programme, in this research a larger number of GB households has been chosen than those in other programmes. GB loans, constituting 41.6% of all agency loans investigated in this research, cover the largest number of households of any one programme within the category of institutional loan. Table 4.3. below indicates the large number of houses built with GB loans and its extensive outreach, with nearly a thousand branch offices throughout the country. Also apparent is the large majority of female GB beneficiaries.

Table 4.3. Grameen Bank housing loans disbursement to 31st December 1995 (*Grameen Bank 1996, p. 116*)

Particulars	Percentage	Total (amount in million Taka)
Amount disbursed		
Female	91	4922
Male	9	462
Total	**100**	**5384**
		Number of houses
Female	91	300,258
Male	9	30,943
Total	**100**	**331,201**
No. of Branch Offices		987

A GB housing loan applicant has to have a good track record with two previous general loans before being considered eligible. The basic concept is to improve the economic condition of a household by providing loans for income-generating micro-enterprises; once a stable income is achieved, a long-term loan for an essentially consumption item such as a house is provided. As a housing loan does not generate income directly, it is provided on a softer condition than a general loan - 8% interest versus 20% per annum. This is also because the house itself is recoverable collateral, a micro-enterprise much less so.

The GB's housing programme is of minor significance in the bank's operation, reflected in only 8.89% of cumulative loan disbursement (by the end of 1995) being for housing versus 88.20% for general loans. Nonetheless, that small percentage amounted to over Tk 5000 million for housing, and resulted in over more than 300,000 houses, testifying to the scale of the bank's operation. The bank was among the first and largest of its kind to assist in house building for the rural poor, but if we consider that the total number of poor rural households (owning less than 0.5 acres of land) was close to 10 million (1992 figure, BBS 1995, p. 10) then the GB has been able to provide for only about 3% of such households. This does not undermine the significance of its work (which expanded tremendously within the decade since its inception), but points to the magnitude of poor households. There are rural housing programmes other than and on a lesser scale than the GB's, but so far their cumulative effort has had even less impact.

4.3.1.2. Affordability for whom?

In spite of the high repayment rate, an important issue requires mentioning. It is not always possible for all beneficiaries to carry out entrepreneurial activities and generate income from loans successfully, and the implicit notion of the bank that all borrowers can be successful entrepreneurs once they have access to credit is flawed. There are bound to be failures, and such failures imply that beneficiaries are in greater trouble than before taking a loan, as now on top of the burden of regular expenses there is a non-productive debt to repay.

This is illustrated by Proshad Chandra Ray's (HH 2) household in northern Bangladesh. It had managed to repay two small general loans, but had very little success in establishing a steady income-generating enterprise. Thus after the household took a housing loan it fell into repayment problems. It had some land, which allowed initial repayment of part of the loan with income from rice grown on the land, but over time all the land had to be sold to keep up loan repayment. The household then took loans from village moneylenders at high interest rates to repay the GB loan, which led to greater crisis. Eventually the household could not finance even the costs of maintaining the house and the original bamboo walls greatly deteriorated. The relationship with local GB officials worsened, and different officials began quoting different figures of money supposed to be repaid. After Proshad's old account book was filled up, the bank took it away and did not give him a new one, so he became confused about how much exactly he owed. Bank officials finally suggested that the household sell off the CI sheet roof of the house to repay the loan. About this, Proshad's wife Kanta said, 'It doesn't make any sense; first they provide us with a loan to build a house, now they say that we should sell the house to pay back the loan'. It was Proshad's idea to take a housing loan and his wife had never agreed. In due time he began to regret his decision.

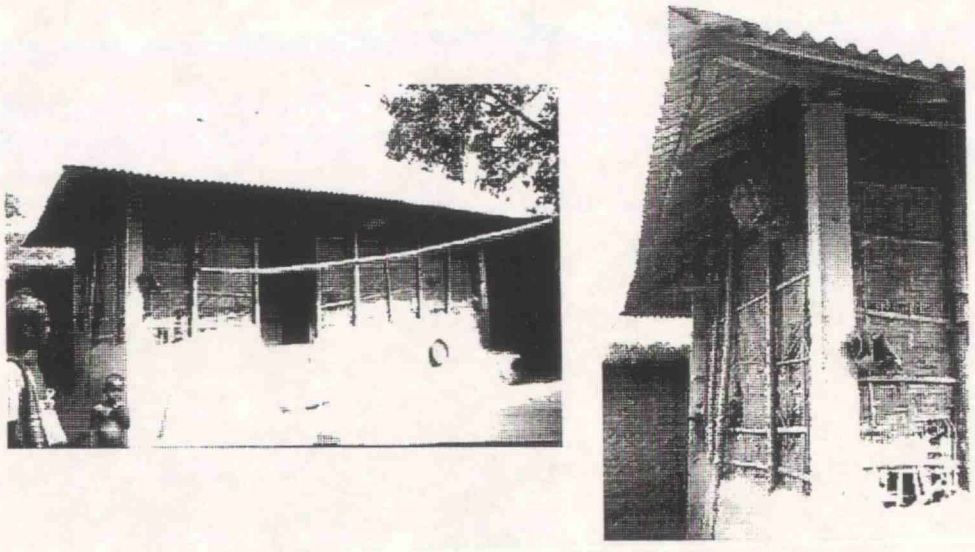
Vignette 4.1. The generous poor villager

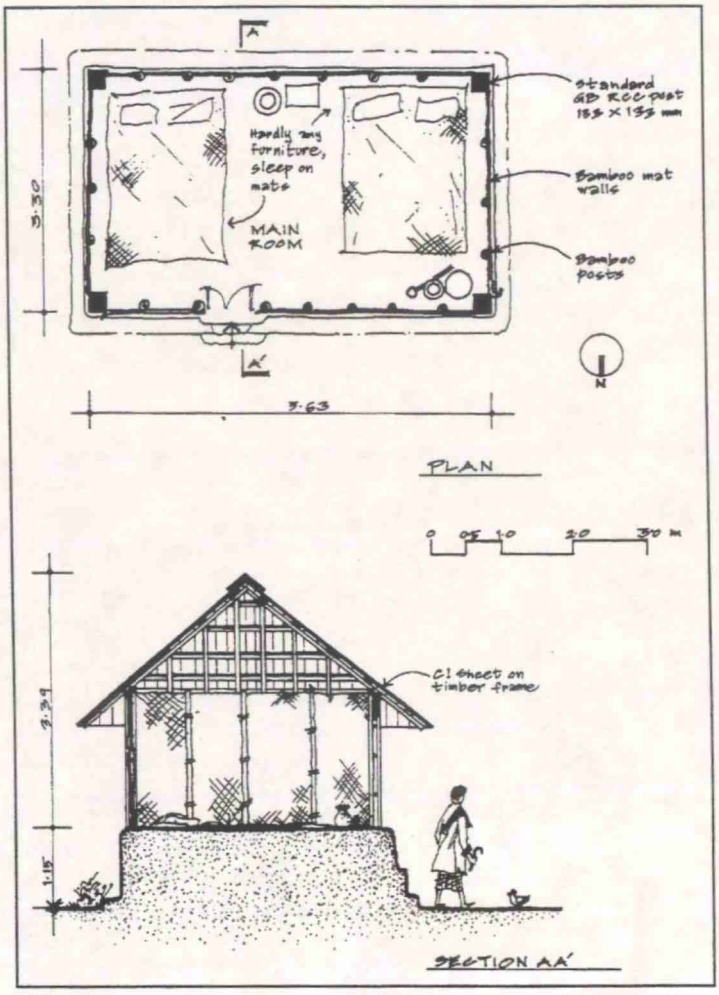
On a hot May afternoon when the interview team visited Proshad's house, he signalled to his small son to fetch tea and snacks from the local shop. It was generally customary for tea and snacks to be offered to visitors, but observing the abject economic condition of the household, the team strongly declined the offer, suggesting instead that after finishing the interview, they could go to the local teashop and drink tea together.

After the interview Proshad accompanied the team to the teashop, and over tea and biscuits the discussion continued. After finishing, Proshad reached into his pocket to pay, whereby he had to be strongly urged not to do so. The interview team members said, 'You have given us so much of your time, the least we can do is to treat you to tea.' But Proshad's reply was, 'You are visitors to our village and hence our guests. How can I let you pay?'

This is perhaps a symptom of class-based deference to the urban middle-class interview team, but there is an additional cultural dimension. In spite of all the economic problems his household was currently facing, Proshad had not lost his cultural sense of courtesy and hospitality. After a long discussion of the precarious financial predicament of his household, this incident made a deep and profound impression on the minds of the interview team of the intrinsic generous nature of many villagers, irrespective of wealth or poverty.

Fig. 4.2. Proshad's (HH 2) house and the deteriorating condition of its bamboo walls





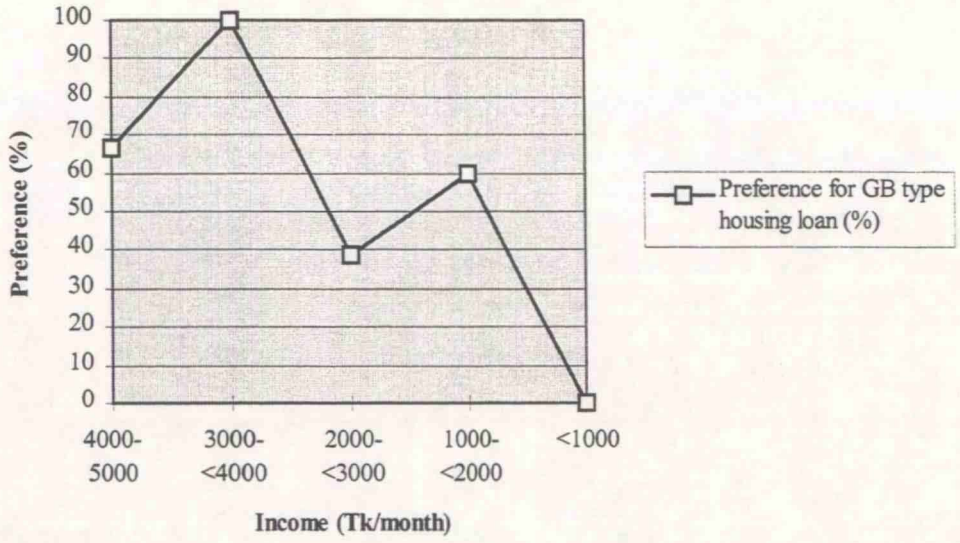
Box 4.2. The Grameen Bank and loan default

There are no available figures for the exact recovery rate for GB housing loans; generally, most literature indicates that it is nearly 100% and comparable to the recovery rate for general loans (see Architectural Review 1989, p. 95; Barua 1999, p. 94). If we assume it to be about 98% (as for general loans), then even 2% default in such a large number of total beneficiary households (more than 300,000) is a considerable figure and may well amount to a few thousand households. It can be argued that, for an operation of GB's scale, such a small default rate is insignificant, and from a banking point of view it can be accounted for as nominal system loss. However, for the defaulting households, their life-histories and economic plight are real and possibly traumatic experiences, not taken into consideration in the hard, quantitative banking accounts. The notion that development can be quantified and reduced principally to a matter of economics is not helpful to these households. Although there is no evidence of legal or police action by the GB against defaulters, there are anecdotes about GB officers seizing houses of defaulters and putting 'big locks' on the front doors, thereby restraining residents from inhabiting them. In the absence of adequate enforcement of a national legal system, the GB is compelled to take the law in its own hands and from the bank's position of institutional self-interest it is justifiable: 'If we have to solve their problems, we have to become a charity', as a GB personnel commented. Who will solve their problem then? Who will understand the sufferings of poor households who have been driven by poverty and misfortune to default and then locked out of their houses to spend the monsoon nights under a tree? Could charity solve the problem? Possibly not entirely.

Nevertheless, it would be unfair to claim that the GB is entirely lacking in compassion. In situations of extreme crisis, such as after the 1996 tornado in Tangail, even though GB did not relax loan repayment for severely affected households, it temporarily stopped taking interest on loans until these households managed to reconstruct their lives. In other disasters, such as the 1987 floods in Rangpur district in northern Bangladesh, the GB formed a special emergency programme and provided new loans ('Capital Recovery Loan') for affected households to generate renewed income and start repaying outstanding loans, while at the same time the interest on previous loans was relaxed and smaller weekly instalments on the principal were accepted. A variety of other loan types were devised for the emergency situation (Fuglesang and Chandler 1993, pp. 165-175). Similarly, after the 1998 floods, the GB forwarded small loans for house repair. However, examples of such provisional measures in circumstances other than natural disasters are lacking; there is little in the GB's operational system that adequately addresses genuine non-culpable default, such as in the case of Proshad Chandra Ray's (HH 2) household.

During the author's field investigation, it was found that many poor rural households did not dare avail themselves of a GB housing loan, preferring to build their houses on their own or with funding from other sources, such as relatives or village moneylenders. To them, the GB type loan represented a risk; many commented, 'How would we pay back such a large loan?' As indicated by Chart 4.1., all households in this study with less than Tk 1000 income per month (the lowest income range within the sample of this research) expressed a strong preference for not seeking an institutional housing loan of the GB type. It appears that households with higher incomes preferred such loans; within the sample, preference for loans generally declined with income. Nonetheless, it should be mentioned that a number of households belonging to the middle range of income in the sample (Tk 2000-<3000) had unsteady and seasonal employment, although on average better off than the poorest households. As shown in Chart 4.1., such households did not prefer institutional GB type housing loans despite relatively better incomes, because of the unstable nature of their incomes.

Chart 4.1. Preference for GB-type housing loan, according to income



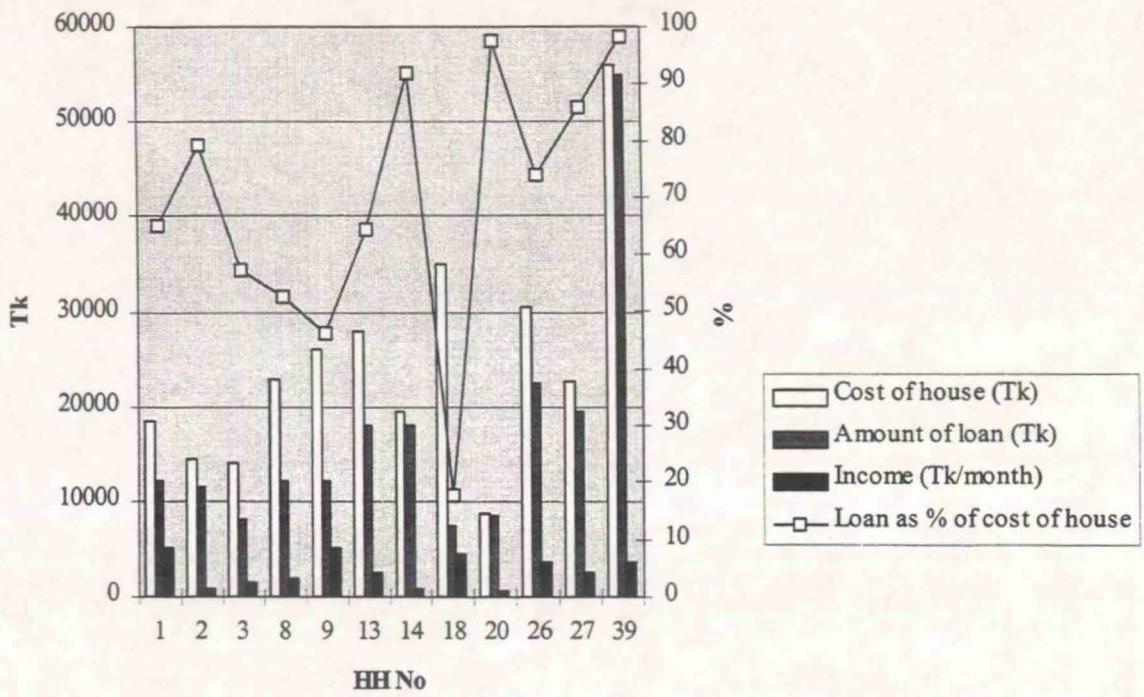
It is clear that housing loans, and for that matter all loans, are advantageous only to those who have a steady income with which to make regular repayment. In its absence, a household can experience serious crisis. Loans do offer access to funds for house building; GB loans with lower interest rates than local moneylenders often appear attractive to villagers. But if, after taking a loan, a household faces disruption in income or employment, or setbacks such as poor agricultural production or natural disasters, it can become entrenched in severe problems. The GB is unable to provide a house to the really poor section of the rural population, who perhaps need it the most. Its success is in first creating a lower middle class household, which can then afford the generally more expensive type of house that the bank stipulates. Two out of three households with the highest income in the sample in this study were both GB beneficiaries (HHs 1 and 9). During the field study it was found that some GB housing loan beneficiaries had invested substantial personal funds in house building, sometimes almost 50% of the cost of construction, in addition to the loan. Such households could have built a modest house without a loan; the loan essentially enabled them to fulfil higher aspirations. The 'basic housing loan' of Tk 12000 and the larger 'moderate housing loan' of up to Tk 25000 are both much larger than the amount many rural poor households generally spend on housing. Even for households with a modest income, it is imperative that the income is steady in order for them to benefit from a GB housing loan. Naz Jahan's (HH 8) household, with a small but stable income of about Tk 2000 per month had managed to avail itself successfully of a 'basic housing loan' and over time had also incrementally extended and improved the house. The type of materials used, loan size and incremental investment in house upgrading was consistent with the nature of household income. Thus it is not only the size of income that is important, but also that that income be steady - not the case for many villagers, who are seasonal agricultural workers. Naz Jahan's husband worked as a carpenter in a local shop and hence earned a salary, a very different situation from those who are self-employed and susceptible to variations in demand for labour.

In other housing loan programmes, similar features were evident. Even in a housing programme such as Proshika's (one of the largest Bangladeshi NGOs), discontinued because of a high rate of

default, households which had continued to repay loans had stable incomes. Lokman Mia (HH 18) had a household income in the higher range within the sample of this research, and he had invested five times more than the loan in house construction. Whether he needed the loan is open to question. Comparable in terms of income to Naz Jahan's (HH 8) household, Ashim Gayne's (HH 27) had availed itself of a loan from a different organisation. Previously when Ashim was a day labourer (*kamla*), he faced problems in loan repayment; as soon as he obtained a job as a night guard with a small salary, he began to repay his loan, as well as incrementally improving the house. In the same area, Enamul Ali's household availed itself of a small pucca house provided on a loan (somewhat subsidised) of Tk 23500 (including sanitary latrine). As Enamul was elderly, he was largely supported by his son-in-law, Bashir, who worked as a driver in a local government office - again a small salaried job. In fact, Bashir worked at the office responsible for providing the house, and the loan repayment was regularly deducted from his monthly salary. A fieldworker's comment about this house encapsulates the point raised here: 'This type of house is for lower-middle class families, not for those with very low income.'

This is evident from Chart 4.2. below, showing that the majority of loan beneficiaries in the research sample had invested a significant amount of personal funds in addition to the loan, indicating their ability to make such investmest because of a relatively stable economic position. In spite of many of these households having generally low incomes, their incomes were steady enough to make housing loans a feasible undertaking. Households 2, 14, 20 and 39 had not invested significant personal funds; they defaulted on their loans as well (as described later in Section 4.3.1.4.), indicative of their low ability to repay loans, or to invest substantial funds in house construction. These households generally had low and unstable incomes, which made housing loans inappropriate to their financial circumstances.

Chart 4.2. Distribution figures for institutional housing loans



4.3.1.3. Preference of the poor against GB type loan

In spite of the recently increased availability of loans from grassroots agencies, during the field study it was found that many households felt insecure about meeting loan repayments every week (especially GB type housing loans), and instead built self-financed houses. Such households did not have a regular income; their income varied over time, according to availability of jobs. For example, the main breadwinner in Shaheda Khatun's (HH 36) household was her son, who worked periodically as a mason. When he found work on a construction site, he sometimes earned over a period and then had to remain unemployed until a new job was available. During the lean period, the household had to manage on savings from the previous job. Understandably, such a household felt insecure about taking a GB type weekly loan. 'It would be shameful if we cannot repay regularly', said Shaheda. However, the household was open to the idea of loan with a monthly repayment schedule, which it felt might be manageable. Momota Begum (HH 17), belonging to a household with similar irregular income, said that it was better not to take a loan and later have problems and face harrassment from officials. Although her household managed to construct a house with its own funds, it was not completely satisfactory, and the household sometimes contemplated taking a loan to improve it. From time to time her husband told her: 'Many of these agencies are giving loans to women, why don't you go and see if you can get one?' But according to Momota:

> The GB requires too much time and commitment. You have to go every week and sit in their meetings, leaving household work untended. They [GB] are too rigid, demanding weekly repayment. Even if somebody has died in your house you have to go to their weekly meetings to repay the loan instalment! I may join Proshika in the future, I have heard that they give monthly loans. We might be able to repay every month, but every week would be too much to keep up with.

Monthly loans might prove conducive to some households' income patterns, but on the agencies' part it might lead to administrative problems. For example, Proshika's housing loan programme with a monthly repayment schedule had to be discontinued because of a high rate of default. On the other hand, the GB maintains a high recovery rate on its weekly loan programme; weekly repayments probably alert an agency to possible problems at an early stage. GB officials believed that the bank's successful recovery can be attributed partly to its strict schedule and constant monitoring, whereas other programmes with more relaxed terms are less successful in this regard. On available evidence, it is difficult to ascertain firmly to what extent loan recovery is related to the repayment schedule. Nevertheless, it is evident that there are diverse household needs and income profiles and it may not be possible for a single programme such as the GB to cater for this diversity. In a programme aspiring for wider outreach, such variability may undermine its aspiration.

4.3.1.4. Default: who to blame - household or agency?

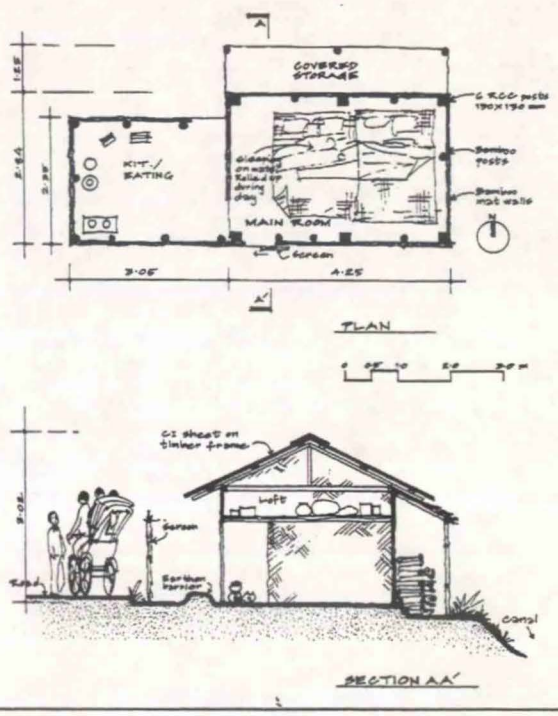
The GB is remarkable in that it has managed to prove itself as an example of good loan recovery in a context of generally widespread credit default. Goetz and Gupta (1996, p. 55) have documented how formal and public sector agricultural credit had a recovery rate of only slightly above 40% in 1987, after years of low and fluctuating recovery rates. This subsequently led to

credit disbursement being revised and its quantity diminished. These authors argue that such credit has generally been targeted to male beneficiaries who are endemic defaulters; females are a less risky target group in terms of loan recovery, as demonstrated by grassroots initiatives such as the GB. This is confirmed to some extent by this study, in which housing loan defaulters were male beneficiaries.

However, during in-depth discussions with defaulting households and programme staff, reasons for default were articulated which suggest that the phenomenon is more complex and cannot be attributed only to a general and endemic male characteristic; it is simplistic to attribute loan default only to a male tendency. An earlier study of the GB in its experimental and pilot stage showed that there were more male beneficiaries than female (58% male, 42% female) receiving significantly greater number of loans (68% of total loans to male beneficiaries, 32% to female), yet the recovery rate for females was marginally higher than male [96.8% male (still a high recovery rate) and 98.4% female] (Hossain 1983, pp. 7, 13). This indicates that loan recovery cannot be solely attributed to gender; rather it can be suggested that GB's high recovery rate from male beneficiaries compared to other institutional credit programmes can be attributed largely to its specific management and operational features. The subsequent expansion of GB female beneficiary numbers can perhaps be more associated with a broader international 'gender and development' lobby, and consequent pressure by the international donor community for more 'gender-sensitive' development (Goetz and Gupta 1996, p. 46), and less with a realisation that females are more credit-worthy. It might be easier to recover loans from female beneficiaries, especially if there is a system of peer pressure as in the GB programme, but a variety of other factors are also related to the issue of recovery/default. Some of these factors, evidenced from field investigation, are presented below.

Kajol Mia's (HH 14) household had settled on public (*khaas*) land by a local politician's patronage, and had received a house on credit from a local NGO, *Jatiya Bandhujan Parishad* (JBP). It is clear that this was also through patronage. The household's income would not have permitted construction of a such a house with CI sheet roof and RC posts. Like many other households with similar low incomes, this one would have had to build a thatch-type house, which generally exerts pressure on meagre household resources because of the need for regular repair. In this respect, the household had benefited from a house requiring less maintenance.

Fig. 4.3. Kajol Mia's (HH 14) house with RC posts and CI sheet, provided on credit by JBP



However, Kajol Mia's low and unstable income from menial odd jobs was simply not adequate to meet regular loan repayment. Their cow had died recently, depriving the household of income from selling milk, further accentuating causes for loan default. Kajol Mia developed a very hostile relationship with JBP staff and began facing constant pressure and threats from them. It was surprising that they did not comprehend his situation of poverty, evident from his living conditions. When this was mentioned to one of the staff members, he unsympathetically commented, 'Kajol Mia is generally dirty. He likes to live like that.' As he was unable to repay the loan, he had become entrenched in a very difficult situation. It appears that he was promised an additional income-generating loan of Tk 3000 in order to enable him to repay the housing loan, but this was never disbursed. The JBP housing project was financed by the United Nations Development Programme (UNDP) and possibly the promised figures were shown on the record, but were perhaps siphoned off by JBP personnel. Thus Kajol Mia's default cannot be attributed to a propensity to default; the role of the lending agency needs to be questioned.

Vignette 4.2. Delayed repayment instead of default?

After the interview Kajol Mia accompanied the interview team to a local teashop. There he asked the team members for advice regarding his situation, as he could not make regular loan repayments for his house and was constantly facing threats from JBP staff. They had recently threatened to dismantle and seize his house by force.

Although it is generally unscrupulous for researchers to become involved directly in local matters, here it became difficult to remain detached. Therefore the team members suggested that even if he (Kajol Mia) could not meet regular repayment, he should pay whatever he could, whenever he had a little extra money, instead of not paying at all. This might serve to calm down JBP staff to some extent. The team members believed that it might allow Kajol to retain the house, and possibly help him to gradually repay on a flexible basis over an extended period. Kajol agreed, and thought this was a good idea, and decided to pay a small instalment soon.

This points to the fact that all defaulter households are not necessarily criminal. Rather, when the repayment conditions are too stringent, households with unstable and low incomes are often compelled to default. If they were allowed to repay on softer conditions, possibly loan recovery would have been higher.

How an agency operates has a bearing on loan recovery. In addition to the points about JBP noted above, it was observed that in the same area as Kajol Mia, there were many JBP beneficiary households who had better incomes but were defaulting. This can be attibuted to JBP's strong affiliations with the former ruling party; with the change in government, their political position had weakened. Hence beneficiaries took advantage of the situation and stopped repaying housing loans. An example was Mohammed Edris's (HH 13) household, in a much better economic position than Kajol Mia's. After repaying two-thirds of the loan, Edris had stopped repaying. Although sometimes agencies may require political backing to carry out their programmes, obtain local support and manage recovery, they run the risk of major upsets to this backing, thereby becoming enfeebled. Whether NGOs should have political affiliations is a matter of debate, generally covered in other literature (for example see Sobhan 1997, p. 39), and beyond the scope of this research. The case of JBP is an example of weakness in such a mode of operation.

Other factors may contribute to loan default. For example, after large scale devastation by a tornado in 1989, EDM (an NGO) provided free housing to a large number of affected households. In subsequent years, when EDM began a loan programme, it could achieve only a 10% recovery rate. The provision of extensive 'grant' housing had created a 'relief culture' - a term used commonly by agency fieldworkers. In such a context it was exceedingly difficult to carry out a credit programme. Ehsan Ali (HH 20), a beneficiary of an EDM house provided on loan, had not repaid at all. He never fully comprehended why he was expected to repay the cost (subsidised) of the house, when the same agency had provided more than 1100 free houses in the same area just a few years ago; his son's household, which also lived on the same homestead site right next to Ehsan, had received one of the grant houses. Other villagers in a similar position urged him not to repay, thereby consolidating the decision to default.

Default may also be linked to the quality of construction and building materials. Porimol Kumar Jolodas's (HH 39) household was provided a semi-*pucca* house through a loan. When completed, the house appeared very attractive, but soon after the household occupied it, it started deteriorating rapidly. The contractor who built it was corrupt and had used very low quality materials; high sand proportion in the cement mortar mix, poor timber for door frames which had later been ravished by insects, etc. Thus, understandably, after initially repaying part of the loan, the household had decided to default. The house was provided on the household's own site, hence they had no alternative but to reside in it. According to a candid staff member of this government project:

> This was a showcase project. The houses were built with semi-pucca materials and photographed soon after completion, and the photos were included in a brochure. This impressed the international donor agency for the project, but in reality the contractors and some of our staff made money and beneficiaries have been saddled with these really poor quality houses. No wonder they don't want to repay. In fact, now they are so angry at us that if we visit the area, we might get beaten up!

These cases indicate factors such as economic position of the household, context, type and operational features of programme, that play a significant role in contributing to loan recovery/ default. Quite often the implementing agency is responsible for default because of the way its programme is implemented and operated. The defaulter Kajol Mia employed a local adage to refer to this: 'You can't clap with one hand.'

4.3.2. General loan from agency

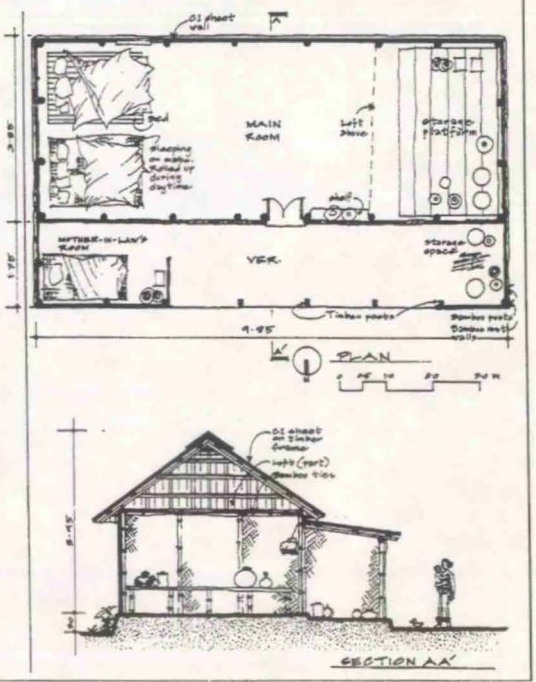
As mentioned in the previous section, the GB has different loan programmes: a general loan of smaller amounts for micro-enterprise development and a larger housing loan tied to the use of specific building components. However, during the field investigation, it was found that this distinction was not maintained by some households who utilised the smaller general loans for house construction. There were also households who had utilised loans from other agencies intended for income-generating activities. Findings from examples of this type of loan utilisation are presented below.

4.3.2.1. An affordable option for the poor

An example of use of a general loan for house construction was Bhorosha Bala's (HH 5) household. The household spent about Tk 5000 to build a house, a much smaller amount than even the GB 'basic housing loan' of Tk 12000 (see Fig. 4.5.). Although Bhorosha was a Grameen Bank member, she was not certain that her household would have sufficient long-term stable income to avail itself of a housing loan. She therefore took a small general loan of Tk 3000 from the bank to supplement household savings and built a house. This was affordable, and she had managed gradually to meet regular repayment over a comparatively short period of time. The household had circumvented the bank's regulation (without its consent and knowledge) of building with RC posts and CI sheet (which required a larger loan), and had generally benefited by access to credit for house building according to its needs and affordability.

Fig. 4.4. Bhorosha Bala's (HH 5) house

Fig. 4.5. Jahanara Khatun's (HH 25) large house, built with the help of a GB general loan



Similarly, in a different area, Jahanara Khatun's (HH 25) household, took a GB general loan of Tk 5000 and used additional household funds to build a large house with CI sheet roof and one CI sheet wall, which eventually cost about Tk 13000. The household had to sell a cow for Tk 5000 to obtain most of the extra funds, yet did not approach the GB for a housing loan. Jahanara felt insecure about seeking a long-term large loan, especially in the aftermath of recent devastation by a tornado:

> Our fate may change, and then what if we can't pay back such a large loan? As it is, even with such a small loan we face difficulty in keeping up with regular repayment; I have to save a handful of rice every time I cook, sell eggs from my chickens and milk from my cow, sometimes depriving my children. But at least we hope that soon the loan will be repaid.

She hoped that over time she would incrementally improve her house, taking small loans one at a time, depending on prevailing household economic conditions, repaying each loan within a short period and gradually acquiring CI sheet for all the walls and RC posts. Such small loans provide the household with the possibility of eventually acquiring a large, durable-type house, according to its needs and in a manner about which it felt secure.

Fig. 4.6. HH 5, with a GB general loan, built a much smaller house (a) than that of HH 8, built with a GB 'basic housing loan' (b)

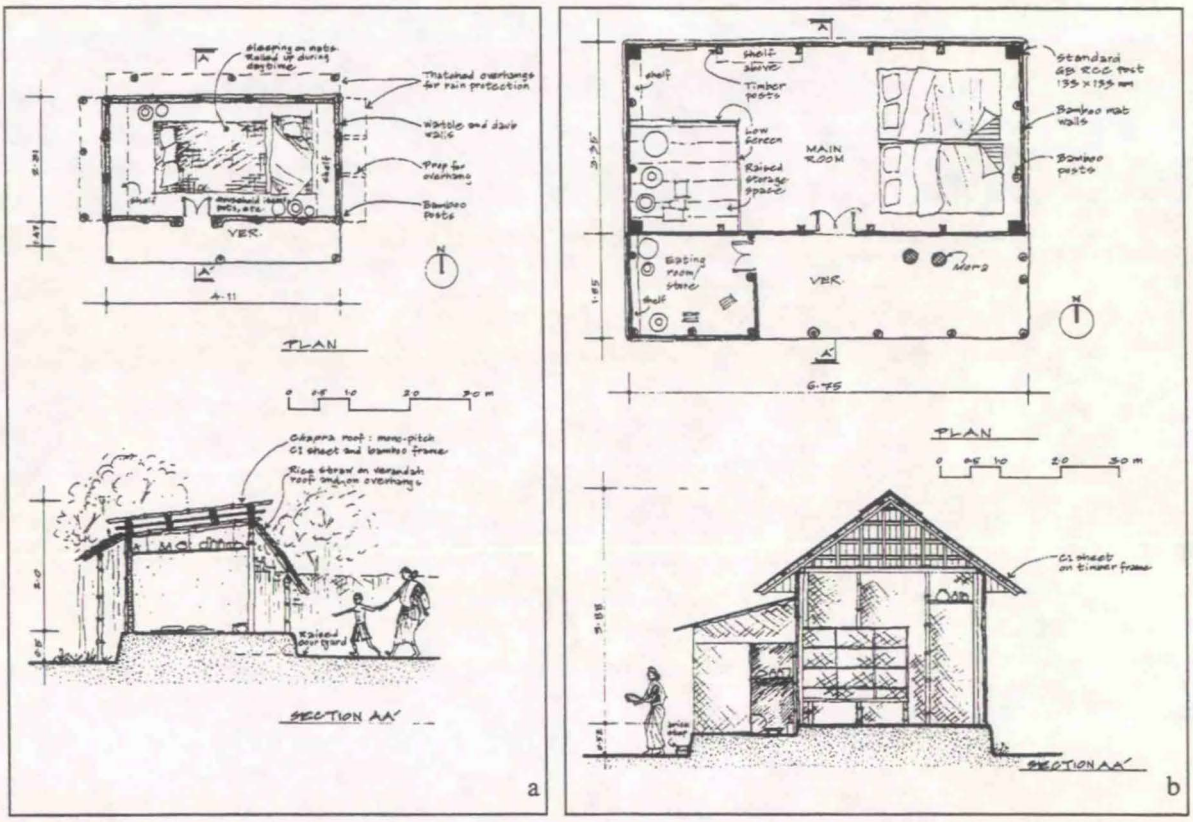
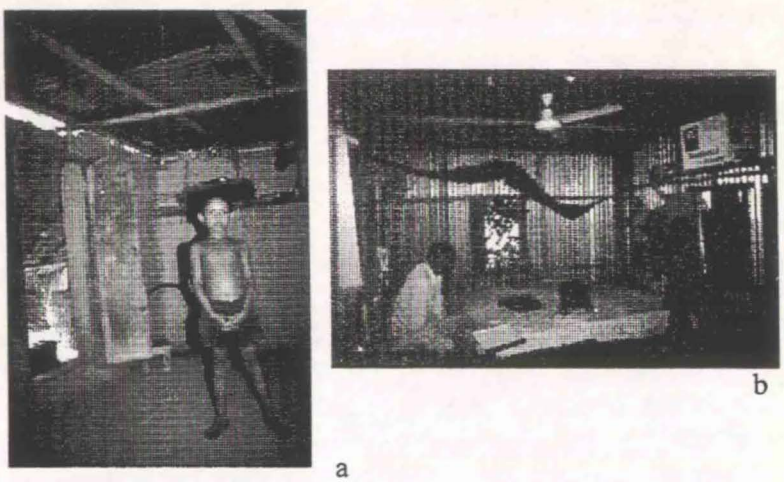


Fig. 4.7. Substantial differences in wealth and living standards are evident in the interiors of Bhorosha Bala's (HH 5) house (a), built with a GB general loan, and Lokman Mia's (HH 18) house (b), built with a Proshika housing loan *(the former's household members sleep on mats on a bare floor and there is hardly any furniture, while in the latter's there are relatively expensive belongings such as a large wooden bed, electric fan and steel* almirah*)*

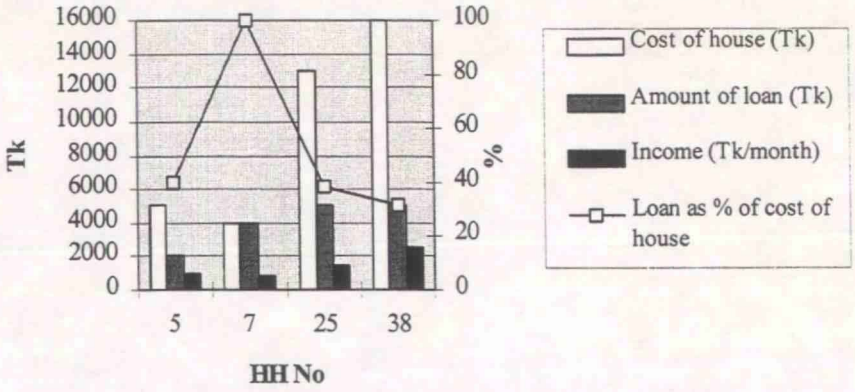


a b

From Chart 4.3. below, it can be noted that households which used general loans for house construction mostly had lower incomes in relation to the costs of houses. However, the costs of houses, as well as the loan amounts, tended to be lower than those built with institutional loans (see Chart 4.2.). This indicates that for households with very low incomes, a general loan enables them to build better and more expensive houses than they could have built on their own, within the

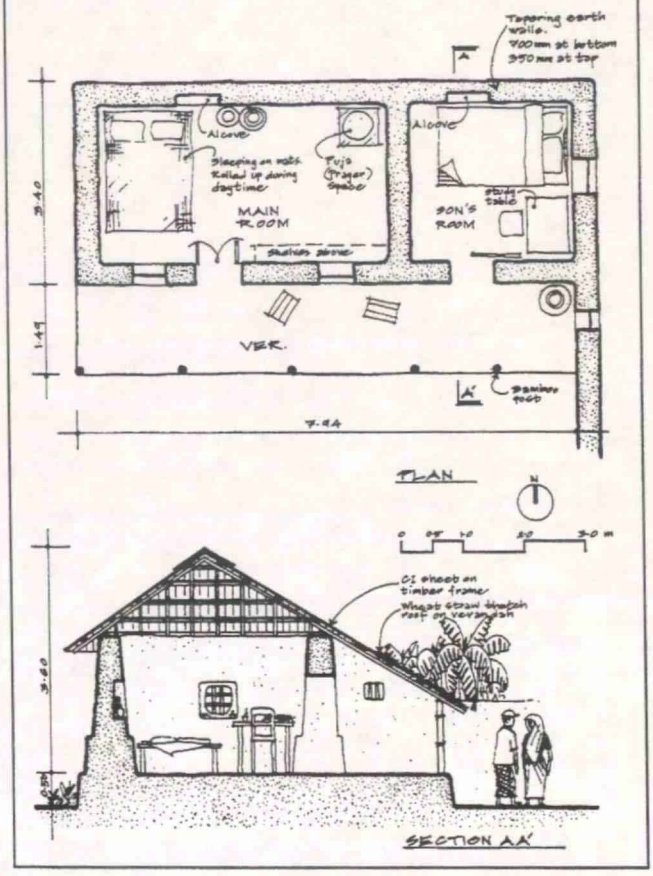
confines of their incomes. These households are not able to afford larger housing loans and more expensive houses, as with institutional housing loans. In the absence of a general loan they may have to seek funds from informal sources, which tend to be even smaller than general loans, allowing the construction of only the least expensive type of house (see Section 4.3.3. on non-institutional loans). General loans thus serve as an alternative between these two extreme credit options.

Chart 4.3. Distribution figures for general loans



Part of the GB's agenda is to promote an improved type of house to enhance the status of its members and the image of the bank. However, that may often prove contradictory to the other aim of the GB: to assist in the social development of the rural poor. So far, the GB has promoted its own house design and programme quite rigidly and thus has not allowed its beneficiaries to participate in making decisions to suit specific circumstances. Rigid procedures of weekly repayment, insistence on a large amount of money as housing loan to build a substantial house, etc may have stemmed from the intent to minimise default rates and to instil a sense of discipline among its beneficiaries; these have perhaps produced results desirable to the GB, but for a large section of the rural population in the lower income stratum they have led to inaccessibility to its programme. High repayment rates, large scale of operation and predominance of female beneficiaries are the records that the international development circle and media are presented with, and these are cited as

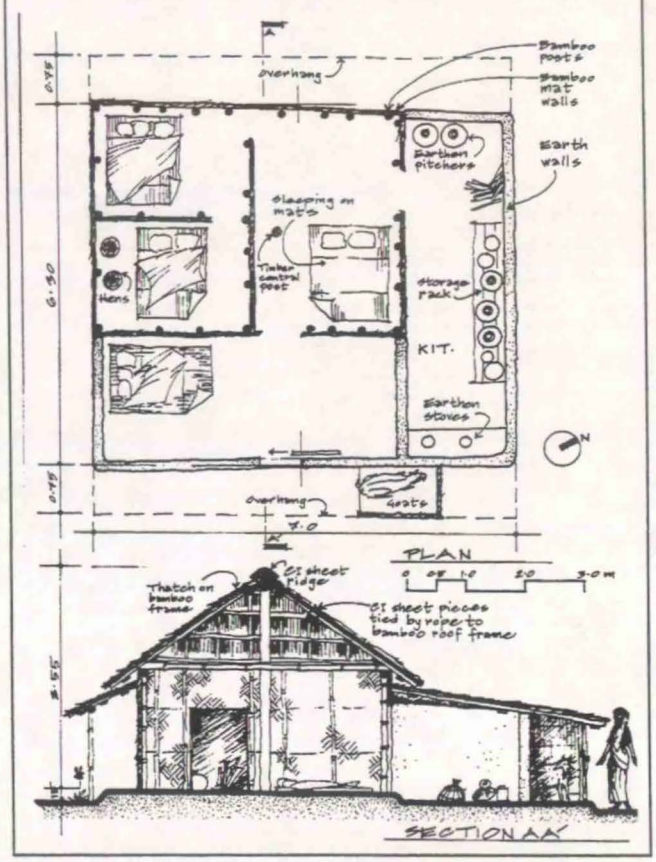
Fig. 4.8. Bhorosha Bala's (HH3) earth house, built with a GB 'pre-basic' loan



measures of success without consideration of more subtle and qualitative (but nevertheless significant) issues.

In spite of the generally rigid terms and conditions of GB housing loans, in size of loan and stipulated construction with RC posts and CI sheet roof, it does have a separate 'pre-basic loan' of a smaller amount, Tk 6500-7500, for earth houses in northern Bangladesh, where use of RC posts is optional. Another Bhorosha Bala's (HH 3) household, living close to Bhorosha (HH 5) mentioned above, took such a loan and built a very sturdy earth house with CI sheet roof, and without RC posts. In this area, where good quality earth was available, as well as local skills of building with earth, this house was built with strong, durable monolithic earth walls, allowing the household to avoid the cost of RC posts. However, such flexibility in loans on a wider scale and more diverse basis was lacking; it was observed during field investigation that some households tended to utilise general loans according to their own needs without endorsement from the GB. It was found that there were many households who did not have a substantially secure and large income, but were yet able to earn seasonally, and they expressed an interest in small loans for house construction or repair, on softer lending conditions than those offered by the GB. Such households could repay small loans within the confines of their income and benefit from them, rather than accept the larger and conditional loans that the GB provided.

Fig. 4.9. Sajeda Begum's (HH 38) house, built with the help of a Proshika general loan



Households also used general loans from agencies other than the GB to fund house building. Sajeda Begum's (HH 38) household took a loan of Tk 5000 from Proshika to supplement the cost of incremental construction of their house which eventually amounted to Tk 16000. As mentioned earlier, Proshika discontinued its housing loan programme after poor recovery performance and provided only general loans. The household had a moderately stable income and had kept up with loan repayment; it would even have been possible to take a larger housing loan such as the GB type (Proshika's housing loan was Tk 7500 and much smaller than even the GB 'basic loan' of Tk 12000). The household lost its previous coastal land and house in a cyclone and moved to the hills to build this house on government (*khaas*) land. As it did not possess secure land tenure, the household did not want a larger housing loan, even if regular repayment might not have been a problem, because of its

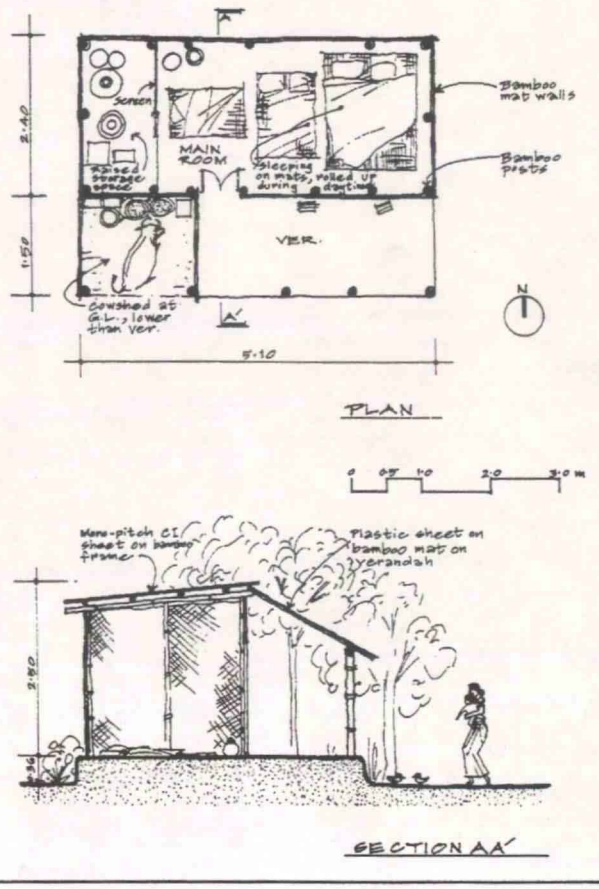
uncertainty of residence in this location. Hence a smaller general loan was adequate, but for a different reason from Bhorosha's (HH 5) household mentioned above. This indicates the flexibility of small loans to cater for a variety of circumstances. Of course, as with Bhorosha's household and the GB, Proshika was not concerned with how Sajeda's household had utilised the loan as long as regular repayment was met, although such loans are provided with the objective of household income generation by self-development of micro-enterprises.

4.3.2.2. Limitations

Although the cases discussed above demonstrate that the households mentioned had managed well in utilising general loans for housing, they generally paid a much larger interest on these loans than with housing loans, and specifically so in the GB programme (20% interest on general and 8% on housing loans). Without being fully aware of it, households were losing out to some extent by paying such a high interest on loans used for a non-productive consumption purpose without direct economic benefit.

Additionally, in spite of these examples of successful utilisation of general loans for housing, for very poor households repaying even such small loans may not have been possible. Many rural households who do not own agricultural land, or have unsteady employment, or cannot make adequate profit from micro-enterprises, have a consistent deficit in their household budgets, which they attempt to cover by loans (also documented in detail by Jansen 1986, pp. 96-111). Alaya Khatun's (HH 7) was such a household with a very low income; it had no agricultural land and owned only their homestead land. Alaya's husband, Mokshed Ali, was a day labourer and had seasonal employment in agriculture, house construction or other odd jobs. Alaya earned a small amount of money by 'sharecropping' cattle on their homestead for other people. In spite of the relatively low cost of Tk 4000 for construction of their house, they had to seek two small loans from the Christian Commission for Development in Bangladesh (CCDB) as they had no funds of their own. In this area, close to Dhaka, costs were generally higher than in other areas such as Bhorosha's (HH 5) village. Thus with this amount of money they could build only a small and flimsy house. Even this would not

Fig. 4.10. Alaya Khatun (HH 7) could only build a small and flimsy house after taking CCDB general loans



have been possible without borrowing money. Before building this house the household lived for an extended period in a crude shelter constructed out of scavenged plastic sheets and was constantly exposed to the ravages of the climate. Being able to avail itself of such small loans clearly have some advantages for such households. Without access to such loans, the household would have had serious problems. It would have been compelled to seek a loan from local moneylenders who charge high rates of interest in this area, often up to 10% per month; failing repayment may have perhaps resulted in gradual loss of the homestead land and other assets, and eventually complete destitution.

However, this did not ensure that institutional loans provided an answer to the household's problems. Having such a low and unsteady income, the household experienced extreme difficulty even in paying back the small loans. To cope with loan repayment, according to Alaya, 'There are days when our children have to starve so that the loan can be repaid.' This statement is possibly indicative of a degree of self-effacement, as Alaya and Mokshed also probably had to starve, not only the children. Thus the question arises whether small loans are appropriate for such households, because as is evident from this case, even such loans are not repayable. Without regular repayment, the household would not be able to seek further loans from CCDB; if a natural disaster occurs, it would spell a very serious crisis. As there was already an outstanding debt, additional loans would cause further problems, but in an emergency situation there may not be an alternative. When discussing this issue, reflecting the uncertain predicament of the household, Alaya said, 'I don't know what will happen [if there is a disaster]. I can only pray to *Allah* that nothing like that should happen.' The flimsy structure that could be built with loans was generally quite vulnerable: the verandah roof collapsed in a recent storm and household members had somehow to repair it. The relatively low cost of construction of this type of house did not generally make maintenance unaffordable, but at the same time frequent maintenance was a constant demand on meagre household resources, especially when there was a loan requiring regular repayment.

Vignette 4.3. Who do NGOs help?

After the interview with Alaya Khatun (HH 7) ended, an elderly woman named Nurimun beckoned the researcher to visit her house nearby. Expecting an interesting example of vernacular architecture, the researcher asked, 'Is it a nice house?' Nurimun said, 'You will see.' Arriving at her house, the researcher shamefully, and with sadness, noted that she was living all alone in a small, flimsy structure, in a state of extreme disrepair. Her sons abandoned her and she had to manage on her own. Fortunately, her neighbours were quite supportive. Some of these neighbouring women (also Alaya) had now gathered in front of Nurimun's house and a group discussion began spontaneously. The researcher asked Nurimun why she did not seek a housing loan, as there were many NGOs active in the area. She simply replied that she would not be able to repay a loan. Another woman added, 'They [NGOs] only help those who are better off. They cannot help those who are really needy.'

Nurimun's house

4.3.2.3. Household loan strategies

Jansen (1986, pp. 96-111) has described a case of a poor household who attempted to manage its household economic deficit by taking loans from various sources, with a general strategy of repaying one loan with a loan from a different source. However, the strategy only worked in the short term; over the long term the household began to lose most of the its land and assets.

This case was documented in the mid-1980s, when NGO-based credit programmes in Bangladesh were less extensive. Since then, within a decade, such programmes have proliferated greatly, and now there are often several credit programmes operating in the same area, especially in rural areas around Dhaka, such as where Alaya (HH 7) lives. There is anecdotal evidence from NGO fieldworkers that many households adopt the strategy documented by Jansen; instead of local moneylenders, they now utilise different institutional programmes as credit sources. These programmes generally have not adopted as severe or exploitatative recovery mechanisms as local moneylenders, and thus households are not in danger of losing their property or assets as long as they manage to repay one loan with a loan from another programme.

Yet this entails households remaining in constant debt, and over the long run they may exhaust all credit sources. The recovery record of an agency may not reflect this situation. As long as the agency recovers its loans, it is projected as successful (such as the GB); the tenuous position of households that adopt such a strategy remains concealed. The lack of co-ordination (in fact, in some cases competition) between different agencies working in the same area greatly contributes to such a situation. How far the situation is sustainable must be questioned.

4.3.3. Non-institutional loans

Maloney and Ahmed (1988, pp. 42-44) have listed a number of sources of non-institutional credit for rural households in Bangladesh. Here these are categorised into two basic groups: personal sources such as relatives, neighbours and friends, and less personal but nevertheless informal sources such as moneylenders, local wealthy persons, shopkeepers, etc. The important source within each of these categories - relatives and moneylenders - are discussed in this section to highlight some of the salient issues relating to non-institutional credit.

For households that have a wealthier relative, it is customary to seek loans from that relative to cover household deficit, including loans for house construction. It is quite common for a wealthy relative to be approached for loans; providing a loan depends upon the relative's goodwill, as do the conditions pertaining to it. In the absence of a wealthier relative, or a patron who is willing to provide loans, a household may approach relatives or neighbours that are not significantly better off than itself. As documented by Jansen (1986, p. 102):

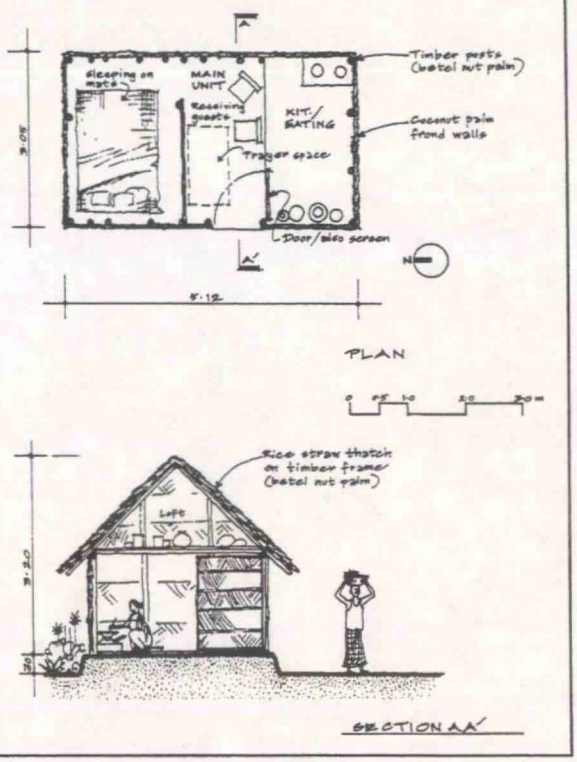
> This is a debt relationship between households of equal economic status. Landless and poor families are very aware of the economic situation of other poor households. As soon as a poor household realises that a neighbouring poor household has more money in hand than it consumes, members of that household are approached for loans.

Although this is quite common, such loans mostly tend to be small and it is unlikely that they are sufficient for house construction of even the least expensive type; at most, a household may borrow for small repairs, or a small amount to supplement personal savings. In this study two cases of loans from relatives have been studied: one borrowed from a wealthier relative to fund the entire construction, and the other borrowed partially to supplement its own funds for building a house. A case of a moneylender's loan is also discussed to illustrate the other main non-institutional credit option.

4.3.3.1. The first option: loan from relative

Jamal Alam's (HH 15) household obtained a loan of Tk 2000 from his uncle to build a house entirely of natural materials, generally the least expensive type of house. Although Jamal sometimes earned upto Tk 2500 in a month, his income was seasonal, as he was an agricultural day labourer and occasional rickshaw driver. The household did not own any land. These factors and the fact that living expenses were generally higher in his area as it was an island and had to depend on supplies transported from the mainland, contributed to this household being a generally low income one. JBP (mentioned in Section 4.3.1. on agency loan) was active in the area, but the household did not want a house from JBP as it believed that JBP charged too much. Also, the household did not feel secure about a long-term loan. Hence it sought a loan from Jamal's uncle, who was relatively better off and lived on the same homestead site of this extended family. It would have been difficult for the uncle to provide a larger loan; hence the household could only build this inexpensive type of house.

Fig. 4.11. Jamal Alam's (HH 15) house of natural materials, built with a loan from his uncle



In this type of house, the wall and roof materials have to be renewed after a few monsoon seasons. The relatively low cost of building materials of this type of house does not generally make such maintenance unaffordable, but at the same time frequent maintenance does tend to exact a regular demand on a household's limited resources. Because of these recurrent expenses, Jamal's loan had not been completely repaid seven years after obtaining it; at the time of the field visit there was still 20% of the loan to be repaid. However, the loan had been provided without a fixed repayment term, hence there was no pressure for repayment as long as some amount was repaid from time to time. Repayment in this type of loan depends on moral obligation and the quality of a personal

relationship. There is minimal chance of default, even if there is delay in repayment; Jamal was in regular contact with his uncle, and he was allowed to pay as and when he preferred.

Thus, compared to institutional loans, there are several advantages with this kind of loan. It is lent on more relaxed terms than agency loans with less stringent repayment conditions. The amount is much less than housing loans from agencies, and even less than most general loans from agencies, therefore a household is not burdened with a long-term responsibility of regular loan repayment. Although the house built with such a small loan is consequently less durable, the small amount of loan causes little pressure on the household for repayment; resources can be utilised according to the household's preference, such as for house maintenance when required. Also, if the lender is a relative living within the extended household (as in Jamal's case), not an agency, loan repayment is on more flexible terms. The household does not have to repay according to a fixed schedule (weekly or monthly instalments) or within a certain period, rather it repays when it can, and the amount of repayment also varies according to the availability of funds. Thus there is much more flexibility than in institutional loans. In addition, as there is no paperwork or formality involved and the transaction is only verbal, there is a definite advantage for households that are not literate. They do not have to depend on others to interpret loan conditions and the possibility for misunderstandings to occur (leading potentially to conflict) is minimised. There is no need to travel to offices and deal with officials, which can at times be intimidating for low-income villagers.

Often, no interest is taken on such loans, especially if the amount is small and repayable within a short fixed term (Maloney and Ahmed 1988, p. 42). In the case of Jamal's loan, there was a fixed interest of a total of 50%, because the amount was relatively large and there was no fixed repayment term. This was a strategy to cover roughly for inflation over the extended repayment period. However, compared to most institutional loans, this interest amounted to a low rate, due to the long repayment period. It appeared that the household was satisfied with the conditions of the loan, and regarded it as better than institutional or local moneylender loans, even though Jamal had to work extra at times and undertake a variety of odd jobs to earn extra money to pay off the loan. Jamal's uncle was present during the interview and he also seemed content with the status of loan repayment. In addition to lending, the uncle provided other forms of patronage: for example, he had a sturdy CI sheet house and during storms, relatives including Jamal's household took shelter there. Thus, this overall patronage created a sense of respect and moral obligation on the part of Jamal's household, thereby minimising the risk of default or irresponsible repayment behaviour.

In the case of Sharmila Begum's (HH 10) household in a very different location, some of the basic advantages of borrowing from a relative as outlined above were also evident. This was a household in a *chor* area and it lived on *khaas* land adjacent to an embankment; the household did not own any land and led a semi-nomadic life, because in this area houses had to be frequently relocated due to riverbank erosion and floods. Similar to Jamal's house, Sharmila Begum's house was also among the least expensive types of house and built entirely out of natural materials.

Although the house was originally built in 1992, most of its materials had to be renewed almost every year after the monsoon, in part due to its frequent relocation. This household differed from Jamal's (HH 15) in that it did not require a loan to finance the entire cost of construction. In 1996, after the monsoons, the household spent almost Tk 1200 to rebuild the house, and Sharmila Begum took a loan of Tk 500 from her brother to cover the deficit in her household funds.

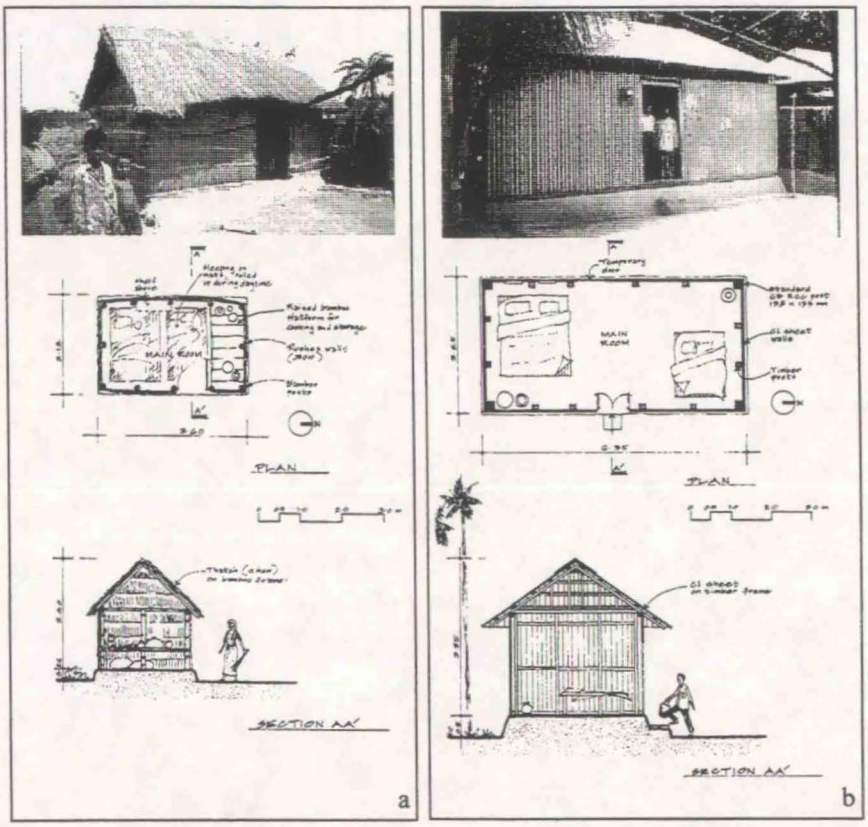
Sharmila's household invested Tk 700 (nearly 60% of the construction cost) in rebuilding the house; it was accustomed to saving from its meagre income and the loan supplemented the household's savings. In spite of a very low income, the household saved small amounts of money consistently over the year, as it knew that extensive rebuilding would be required almost every year. According to Sharmila Begum:

> We spend most of our income and save a bit with difficulty, because we know that that the house would have to be rebuilt so that we, and especially our children, have a shelter. I can't give you any accounts, every day we try to save a bit from our daily income of Tk 20-25 after spending on food, etc over a long time. We didn't save the money in one day.

This somewhat systematic pattern of short-term planning was not always adequate, as the household did not have a steady income; hence the loan from Sharmila's brother. As this type of house requires frequent maintenance, the future of the household was uncertain. The loan had not yet been repaid and the household was facing difficulty in doing so. If the present loan could not be repaid before the next reconstruction season, and if sufficient savings were not available then, whether a new loan would be forwarded or a different source would be available was a matter of doubt. This might lead into a difficult situation. Even if a new loan was forwarded, that might plunge the household into a expanding cycle of debt, overcoming which might eventually be terribly difficult. Knowing this, the household had the intention of repaying. As Sharmila Begum said, "We would have to live in great difficulty to repay the loan, but we plan to do so slowly."

According to Islamic inheritance law, land is divided so that a daughter receives half of the amount inherited by a brother. In practice, women often tend to be deprived of this right, or they do not claim it, with the expectation of future support from their brothers. This situation has been documented by several authors (Jansen 1986, p. 110; Maloney and Ahmed 1988, p. 5), who suggest that this affinal relationship serves as a dependable source of credit, with the implicit understanding on the part of the brother that his sister and her husband would not make a claim on his property. It was not possible to verify if this was true in Sharmila's case; it would have been too sensitive an issue to raise. But given her credit relationship with her brother, such an assumption could prove accurate, in which case her household would possibly be able to draw support from him and delayed repayment would not be a major issue.

Fig. 4.12. Within the research sample, Sharmila Begum's (HH 10) household (a) was among the lowest income range and Moinu Mia's (HH 9; a GB beneficiary) (b) among the highest *(their houses varied greatly in size, building materials and living standards; both lived in the same area in Manikganj district)*



Given the low cost of construction, even though the loan comprised about 40% of the cost, it was a small loan. The availability of such small loans in situations when a household really needs extra funds can greatly benefit such a household. Sharmila's loan was also without a fixed repayment period and lent on flexible terms. However, unlike Jamal's (HH 15) loan, there was no interest, which certainly made it easier for the household to repay it.

Vignette 4.4. The fraudulent NGO

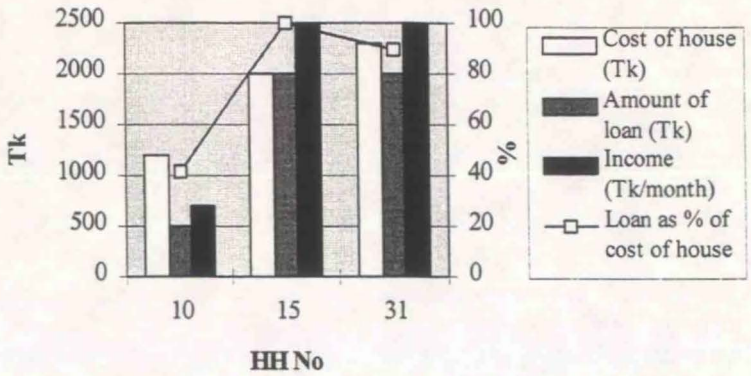
Sharmila Begum's and some other landless households were attracted by a new NGO in the area who promised them easy loans: 'If you people form savings groups with us, we will give you loans for everything.' The households paid membership fees and began depositing weekly savings from their meagre incomes. However, suddenly, the NGO disappeared from the area with all their money and was never seen again. The poor households had been deceived and their money was never returned. Sharmila Begum now had a deep mistrust of all NGOs.

The widely expanding proliferation of institutional credit and savings programmes in rural Bangladesh serves to inumbrate fraudulent agencies that take advantage of this phenomenon to cheat unsuspecting villagers. Within the prevailing trend of more and more small organisations to mushroom, perhaps such fraud is inevitable. As yet the great majority of agencies do not engage in such fraud, but from a villager's point of view, how to know which agency is genuine?

One of the basic characteristics of non-institutional loans is that they tend to be small in relation to household income, and are utilised to build the least expensive types of houses. This is evident from Chart 4.4. below. If this is compared to Charts 4.2. and 4.3. above, it can be observed that the sizes of institutional loans were generally much higher than non-institutional ones and often well exceeded

the monthly incomes of households that had taken the institutional loans; the cost of houses built with institutional loans also generally tended to be much higher in relation to household incomes. It can be argued that such small informal loans do not allow a household the opportunity to improve its living conditions, and the poverty of the household is perpetuated. But it also has to be borne in mind that unless the number, variety and scale of institutional credit programmes are expanded throughout rural areas (without compromising quality), for many low-income rural households non-institutional credit will continue to remain a viable and possibly one of the only available modes of access to funds.

Chart 4.4. Distribution figures for non-institutional loans



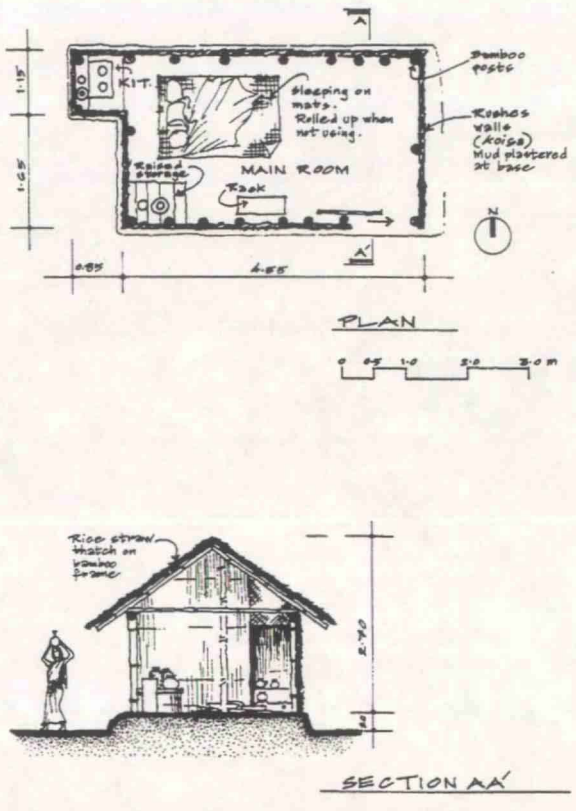
Although the above examples indicate some of the positive aspects of credit from a relative, sometimes the best source of credit for low-income households, there is a complex variety of credit arrangements within this type of relationship. Low-income rural households adopt a diversity of credit options to cope with the need for funds for house construction and maintenance, including institutional credit, non-institutional credit, a combination of both, or a combination of various sources. Not all of these personal credit relationships are beneficial to households. Jansen (1986, pp. 113-122) has documented how a credit relationship between two brothers eventually allowed the land owned by one brother to be transfered to the other brother's ownership. Nevertheless, this case is extreme and generally households having access to such a personal source of credit are more fortunate than most villagers.

4.3.3.2. The moneylender option

In the absence of a personal source of credit, and also lack of access to institutional credit for a variety of reasons, many households have to seek credit from moneylenders (*mohajon*). Much of the literature on moneylenders depicts them as persons who are interested in acquiring land and therefore lend to poor households with a view to seizing their land or other assets on failure in repayment (for example, see Jansen 1986, pp. 140-145). One of the basic stated aims of the GB is to prevent exploitation by moneylenders (Holcombe 1995, p. 61) and their high interest rates are often cited as exploitative (Fuglesang and Chandler 1993, pp. 20-21).

Mofizul Haq's (HH 31) household borrowed Tk 2000 from a local village moneylender to finance house construction. Similar to houses in the other cases of non-institutional credit cited above (HHs 10 and 15), this house was also of an inexpensive type, built of natural materials. Mofizul's wife wove mats at home, which brought in some income, and together with his income as a rickshaw driver and from their small landholding of 0.33 acre, the household's total income sometimes amounted to more than Tk 2500 per month, but this was seasonal and somewhat unsteady. This household's situation was quite similar to Jamal's (HH 15), but it did not have access to credit from a relative or neighbour. Not feeling secure about seeking a larger, long-term institutional loan, the only available option was to borrow from a moneylender. The small landholding served as collateral.

Fig. 4.13. Mofizul Haq's (HH 31) house of natural materials, built with a loan from a moneylender



Even though the loan was small (compared to institutional loans) and the household did have some disposable income, lending terms of the moneylender were strict, in addition to a high 10% monthly interest. Thus maintaining regular repayment was sometimes difficult. As Mofizul said, 'I have to repay the moneylender by myself not eating regular meals'. At times when he found it difficult to meet monthly repayment, he tried negotiating to defer instalments, but the moneylender became very annoyed and did not agree to relax repayment terms. Nonetheless, one-third of the loan had been repaid within four months, although the instalments had been somewhat erratic. Given the need for regular reconstruction and maintenance of the house, it appeared that the household would have to depend on the moneylender for the foreseeable future. There was the constant possibility of loss of the property due to inability to meet repayment, and the question remained whether the household would be able to keep up with this mode of financing over the long term.

4.3.3.3. Formal versus informal loans

Notwithstanding the problems identified above, especially with loans from moneylenders, non-institutional loans do have some advantages. These have been articulated by Maloney and Ahmed:

> When a person borrows from an informal source he need not fill any forms, pay an application fee, suffer any office indignity, manoeuvre through any intermediary, pay any bribe, get any recommendations of UP members, collect various documents, register a mortgage of land, explain details to justify need for loan, or make repeated visits and take days off from work in a

> busy season. An informal lender cares little how the loan is used. He informs the applicant immediately if he can get the loan or not. Usually repayment term is open-ended or whenever there is a harvest.
>
> (Maloney and Ahmed 1988, pp. 46-47)

Most of the disadvantages of formal lending institutions are applicable in the case of national banks; grassroots programmes such as the GB have managed to overcome some of them by minimising some formalities and avoiding strictly class-based models by literally providing banking at the doorstep of the borrower. However, there are as yet strict regulations regarding group formation, loan conditions, stipulated disbursal of funds leading to delay, etc. Given the aim of the GB to serve as a better alternative to village moneylenders, its effectiveness in achieving this can be questioned. Apart from a lower interest rate and provision of collateral-free loans, it is doubtful if there are other significant advantages to institutional loans compared with Mofizul's (HH 31) moneylender. He did not have to become a member of any group-based savings programme, availed himself of a loan when he needed it and maintained a large degree of independence from institutional formalities.

Despite high interest rates (generally 10%-12% a month), if there was a possibility that the household would repay the loan, moneylenders do offer access to non-conditional credit and prompt disbursal when a household requires lump sums, usually within the familiar setting of the village. There is little scope for default, as most rural moneylenders are influential and possess political clout; lack of repayment spells serious problems for the household. The household may then have to sell assets or property to repay the loan. Nonetheless, as with most non-institutional loans, the basic advantage of such loans is that they offer a household the possibility of accessing a lump sum for building a house, of an amount considered affordable by the household, subsequently repayable in small instalments.

4.4. GRANT: THE WELFARIST APPROACH

The term 'grant' is used here to refer to provision of houses by agencies as gifts to households. In this research, no instance was found in Bangladesh of provision of monetary grants by agencies for entire house construction, hence the discussion is grant housing built and provided by agencies, with or without the participation of beneficiaries. This system qualifies as a financing mechanism, a welfarist mode of meeting the cost of house construction, unlike the cost-recovery approach associated with loans. Sometimes agencies, and specifically the government, distributes building material grants (mainly CI sheet), often combined with small cash grants. These grants are seldom sufficient for building complete houses, they are intended to supplement household resources for repairing damaged houses. This does not strictly qualify as grant housing; it is discussed only where relevant.

Most grant housing in Bangladesh is provided as 'relief' after natural disasters, an effort by agencies to rehabilitate affected households. Although such efforts may sometimes be linked by agencies to other development activities, they generally tend to be one-off projects, built mainly

with international funding obtained as a response to disasters. Especially in the case of NGOs, grant housing is seldom undertaken as part of a long-term housing development strategy. However, some of these projects did expect to contribute to the future welfare and hazard resistance of beneficiaries by their rehabilitation and provision of comparatively more durable types of housing than the traditional types generally built by low-income households. On the other hand, the government has an extensive and on-going rural housing programme to settle landless households by provision of homestead land and housing, where there is the attempt to cater to long-term development of beneficiary households. This programme also attempts to build partnerships with NGOs and involve them in on-going community development.

The welfarist paradigm of grant housing is implicitly predicated on reaching a target group unable to provide effectively for itself. Thus the level of poverty of a household and the effectiveness of its self-initiative in house construction as assessed by the concerned agency are the basic criteria for eligibility in grant housing. The mismatch between this assessment and actual conditions is one of the basic factors noted in grant housing.

4.4.1. Post-disaster rehabilitation

A variety of natural disasters besets rural communities in Bangladesh. Grant housing provision by agencies is undertaken mainly as a response to disasters. In such circumstances, increased funding is available from international sources to make grant housing economically feasible for agencies. Under normal circumstances most agencies, especially NGOs, are unwilling or unable to finance grant housing, as it requires substantial non-recoverable financial input. Hence the majority of cases of grant housing in this research are examples of post-disaster rehabilitation.

Box 4.3. World Vision Bangladesh's (WVB) flood-rehabilitation programme, 1988-89

After the major floods of 1987 and 1988, WVB's budget more than doubled from $ 4 million to $ 8.5 million. A number of major international donors, including the ODA (providing more than 40% of funds), CIDA and USAID, as well the various World Vision offices around the world, extended large amounts of funding for humanitarian relief. In fact, WVB was somewhat overwhelmed with this 'overfunding', with hardly any previous experience in and lacking capacity to utilise such a large volume of funds. More than 50% of these funds were utilised for providing grant housing; nearly 4000 new houses were built in different rural areas of Bangladesh, and more than 2000 houses were repaired in urban areas (Hodgson and Whaites 1993; Mitchell and Slim 1990).

4.4.1.1. Targeting the vulnerable

One of the crucial issues involved in such grant housing is to reach a target group of households that are unable to re-construct houses on their own after a natural disaster, or face significant difficulty in doing so. This is imperative in the light of the great volume of households usually affected and the importance of utilising available funds effectively. A portion of funds that become available after a disaster can be utilised in other long-term productive development programmes, instead of indiscriminately spent on providing housing to households who might possibly manage to recover on their own. The importance of careful needs-assessment after a disaster and prior to

housing provision needs to be emphasised. It can be argued that during the great confusion that usually follows a disaster, it is exceedingly difficult to monitor selective provision. However, field investigation shows that a number of post-disaster housing programmes were carried out over an extended period of several months after a disaster, indicating that the time required for careful needs-assessment was available after the initial tumult following the disaster had settled down.

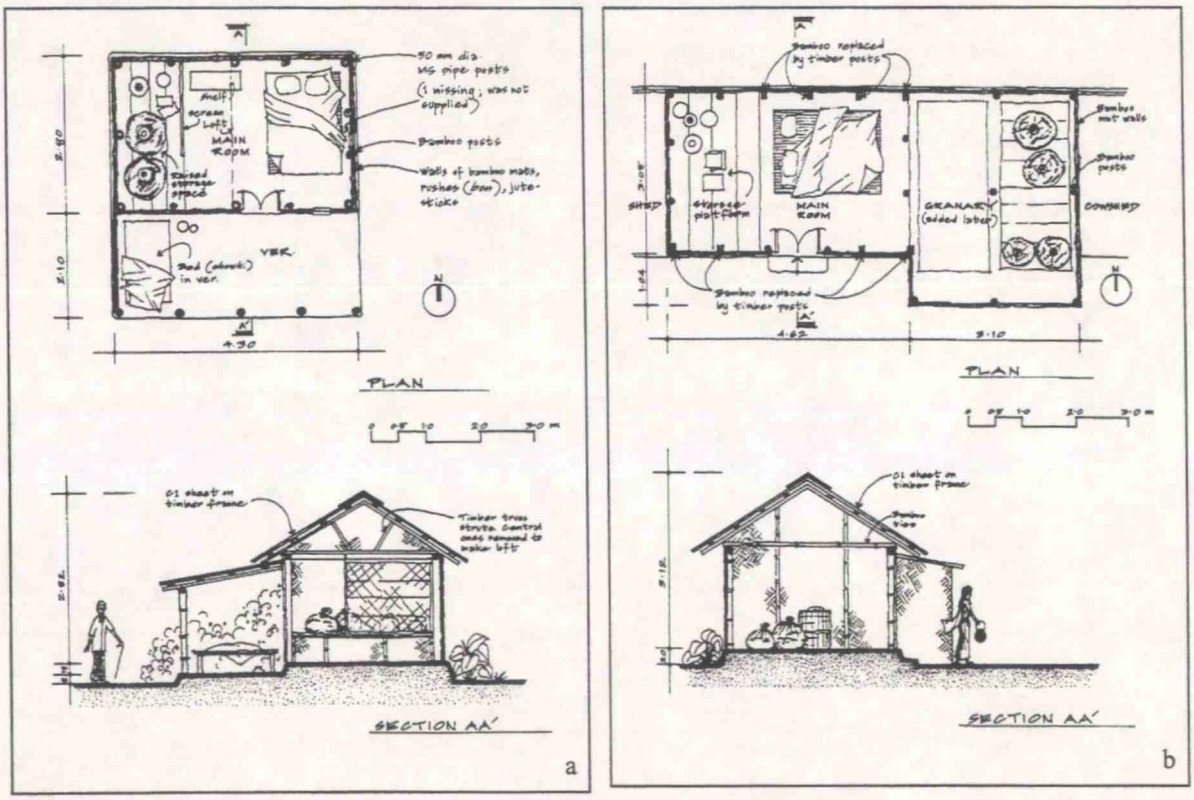
Borhan Uddin (HH 21) was a medium size agricultural landowner owning about 5 acres of land (according to the Household Expenditure Survey report, BBS 1995, p. 19, a household was classified as a medium size landowner if owning 2.5 to 7.49 acres of land). He had a large house with CI sheet roof and walls, indicative of his relative economic well-being. It was destroyed along with most other houses in the area in the 1989 tornado. After the tornado, the NGO Enfants du Monde (EDM) provided more than 1100 grant houses with metal structural frame and CI sheet roof, of which Borhan was a recipient. His economic position entailed that he would have been able to rehabilitate his household without any external assistance, although it may have had taken some time for his household to recover and re-orientate itself. 'If not anything, at least I could have built a thatch house', was his statement, indicating a better condition than many of his poorer neighbours who had hardly any resources with which to begin rehabilitating themselves. After receiving the EDM house, Borhan incrementally spent an additional Tk 5000 on improving it, more than 40% of the cost of the house, further indicating his ability to manage without external assistance.

It is apparent that grant housing is not really appropriate for such households, especially in the context of a large number of needy households. According to EDM staff, this was not an issue, as sufficient funds were available to provide houses to almost all affected households in the area it chose to work in, irrespective of their economic status. However, it can be argued that availability of funds is not sufficient reason for spending them; careful and selective provision may allow utilisation of surplus funds for other projects. This might in reality be difficult for NGOs to implement. Firstly, donors are interested in being informed that their funds have been utilised for post-disaster relief, and the number of houses built is a readily quantifiable measure to satisfy that purpose. Secondly, selective provision may lead to conflicts within the local community, posing formidable perils to NGO fieldworkers and to the general operation of NGOs in an area.

To cite an example of such conflict: When another NGO, the Association for Social Advancement (ASA) distributed grant houses after the 1996 tornado in Tangail, in spite of nearly 1000 houses eventually being built, it was possible to cater to only half the demand. Local influential persons (*matbors*) and community leaders exerted pressure on ASA to provide houses to households with which they had relationships of patronage and political affiliation. Not responding to such 'requests' (a local euphemism; actually 'demands' would be a more appropriate term) would have jeopardised ASA's future operation in the area. In fact, initially when ASA refused to comply, there were instances of when fieldworkers alone on bicycles were threatened and almost assaulted by villagers. This affected ASA's quality of work, and in the initial stage of housing provision,

major problems with construction labour, supply and transport of building materials occurred. Thus at a later stage of the rehabilitation work, ASA became compelled to provide houses to households such as Laila Khatun's (HH 24), another small landowning household with an economic profile similar to Borhan Uddin's, cited above.

Fig. 4.14. Borhan Uddin (HH 21) and Laila Khatun (HH 24), both medium size landowners, received EDM and ASA grant houses respectively (a and b). Their economic position is indicated by their capacity to make extensions to the houses.



In spite of the importance of accurate needs-assessment, there are often borderline cases, and for fieldworkers carrying out post-disaster assessment it is extremely difficult to formulate a list of only the neediest households. Moreover, in the aftermath of a disaster, widespread devastation means that most households are temporarily affected, and the distinction between the neediest and slightly better-off households then tend to become blurred. Such an example can be seen in Shehab Ali's (HH 32) household, which received a grant house from Caritas, another NGO involved in rehabilitation work after the 1996 tornado in Tangail. Shehab had a small landholding of 1.5 acres (thus classified as a small landowner, BBS 1995, p. 19). In a context of widespread landlessness, this certainly made the household better off than most; in his district (Tangail) in 1996, only 32.7% of households owned more than 1 acre of agricultural land (BBS 1997, p. 178). Before the tornado, he had a house with CI sheet roof, indicative of a relatively better economic status. Nonetheless, his former house did not have CI sheet walls, suggesting that this status was only marginally superior to poor households. It is understandable that it may had been difficult to eliminate such a borderline case during needs-assessment. As Shehab and his wife were both elderly, their household may have appeared very vulnerable after the tornado. However, such an assessment might have had ignored the fact that Shehab had two adult sons with separate

households who provided him support, and that he was the owner of a small piece of agricultural land. To find out such facts would require intensive and extended involvement of agencies, difficult in the bewilderment following a disaster; often rapid rehabilitation entails needs-assessment by first impressions. To further complicate matters, there are the *matbors* with their 'requests'.

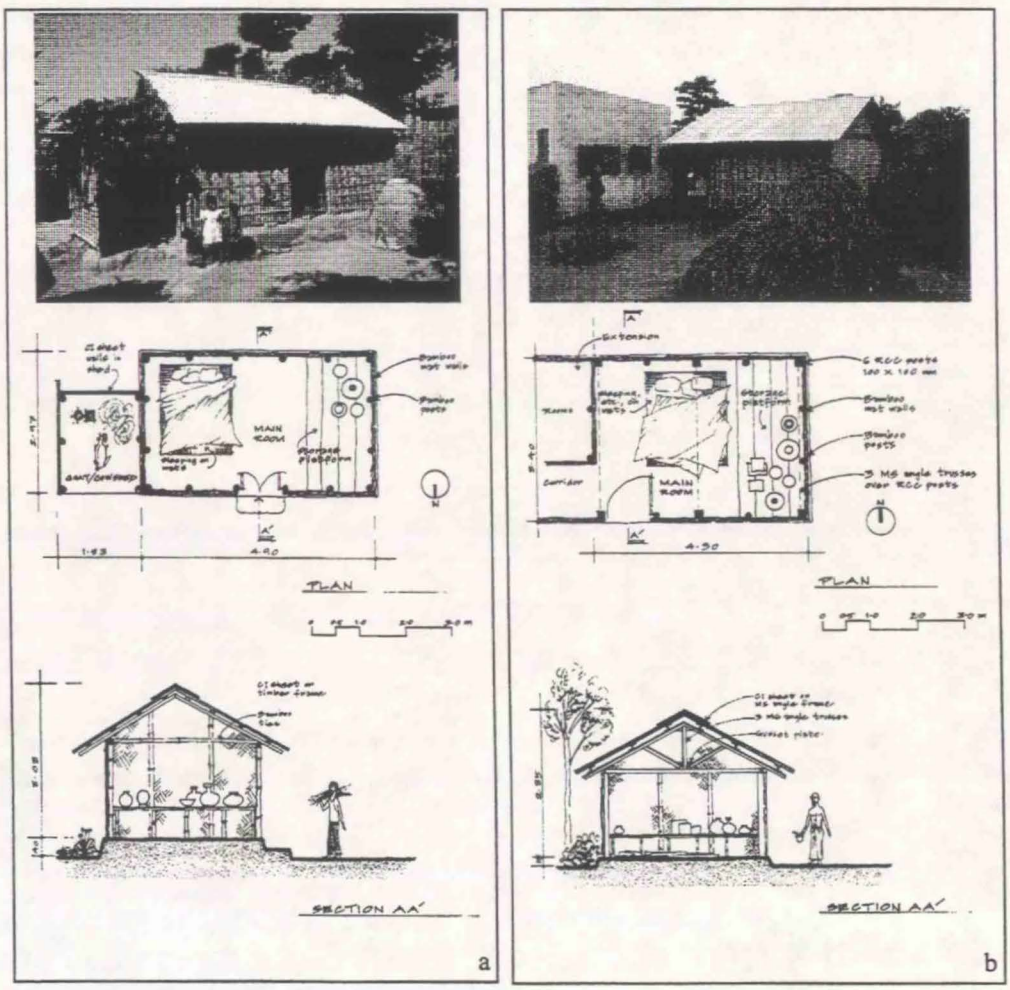
If the work of ASA and Caritas, two NGOs working in the same area after the 1996 tornado, is compared, several analytic points can be raised. Unlike ASA, Caritas did not have a local office in the area where the tornado occurred and sent fieldworkers from its office in north-eastern Tangail, more than 50 kms away; moreover, the transport links were weak between these two areas. Caritas disbursed houses earlier than ASA, a month or so after the tornado, compared with ASA's nearly four months. As mentioned, rapidity of disbursement often entails less selective provision; these factors affected the needs-assessment of Caritas, resulting in inappropriate targeting. On the other hand, ASA was already active in the area, and had an existing network of members. ASA targeted its general community development programme at low-income households, hence most of its members were poor and required rehabilitation. The bulk of ASA's grant housing was provided to these members, thereby reducing unreliability in needs-assessment, assisting households who had been identified as poor prior to the tornado. Caritas had to undertake a fresh needs-assessment exercise after the tornado in an unfamiliar area.

Another instance of Caritas's work, underscoring the importance of in-depth needs-assessment for appropriate targeting, is Anis Ali's (HH 33) household. This household had all the trappings of an apparently poor household. It used to live in a thatch house before the tornado and did not own any agricultural land, making rapid needs-assessment very difficult. Within a year of receiving a Caritas house, the household bought new homestead land and relocated the house to this site. This indicates that the household was not as poor as it seemed; it had savings to make a large purchase. If it had not received a Caritas house, it could possibly have rehabiliated itself, even though that may have compromised the future objective of buying land. Thus receiving a grant house had allowed the achievement of the household's primary objective, and had benefited it in a way that was divergent from Caritas's intention of providing houses to the most needy.

It should nevertheless be emphasised that grant housing does have the advantage of rehabilitating households that are very poor and unable to recover on their own. It has been found that in the absence of adequate rehabilitation after disasters, a large proportion of poor rural households are compelled to migrate to cities (Shakur 1987, p. 1), or to live at a very degraded level. Jasmin Ara (HH 29) became a widow with two small sons after she lost her husband when he died of snakebite in 1988. Even when he was alive, the household was very poor and lived in a dilapidated thatched house. When a cyclone struck this coastal region in 1991, the house collapsed entirely. Jasmin, without the support of an adult male at that time (an especially vulnerable position for women in Bangladesh), barely managed to rebuild a makeshift shelter, where she lived with her children in the greatest of difficulty for about a year, before she received a grant house from the

Rural Development Foundation (RDF). It should be mentioned here that RDF did not carry out a long-term integrated development scheme as it had originally envisaged; for a variety of reasons, it had to discontinue the major part of its operation a few years after its inception. Hence, apart from a house, Jasmin did not receive any long-term assistance and she mainly begged for a living. Nonetheless, at least the house provided her and her children with a relatively secure shelter. This illustrates the value of grant housing in rehabilitating extremely poor households, despite the shortcomings of RDF in completely rehabilitating Jasmin. Single parent households, especially those headed without the support of an adult male member, find it very difficult to cope with the demands of eking out a livelihood under normal circumstances; after a disaster such households are rendered completely insecure. These households should be at the top of the needs-assessment list, as in RDF's programme. The unsuitability of any alternative to grants for such households cannot be overemphasised.

Fig. 4.15. Nazmul Islam's (HH 23) ASA house (a) and Shehab Ali's (HH 32) Caritas house (b)

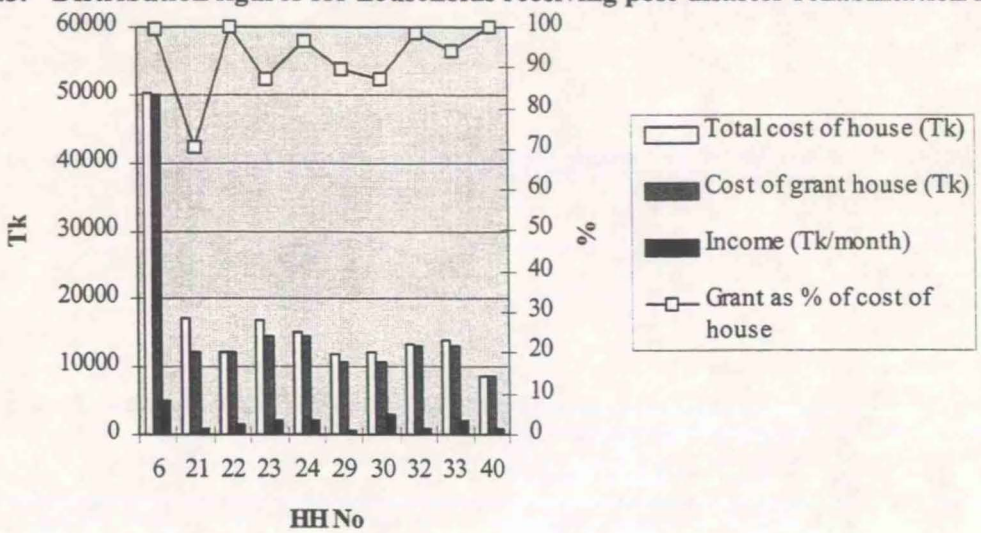


It has been pointed out by Mitchell and Slim (1990, pp. 38, 66) that it was equally important to rehabiliate 'not-so-poor' farmers after a disaster, as they provide employment for poor agricultural workers who urgently need work to rehabilitate themselves. Nonetheless, these authors suggest that rehabilitation of relatively better-off households should not be undertaken by grants. Rather, soft loans on relaxed terms offer an appropriate rehabilitation strategy; grants should be allocated

only to the poorest households. In the programmes researched in this study, covering a substantial number of such programmes in Bangladesh, a combined strategy of grants and loans for post-disaster financing according to household economic status was missing. Thus, although conceivably advantageous if managed well, it is difficult to assess the likely effectiveness of such a strategy, or to surmise whether it would produce its own intrinsic problems.

Despite the anomaly in targeting discussed above, in this research sample, mean income (Tk 1920/month) of the households who received post-disaster grant housing (N/4=10) was lower than mean income (Tk 2267.5/month) of the entire sample (N=40). Although this may not be a significant difference, as Chart 4.5. shows, households with post-disaster grant housing generally had incomes below the mean income range of the entire sample. This indicates that even though grant housing may not always have reached very poor households, there was a tendency for it to be targeted to households that were at the poorer end of the scale. Some of these households may have had the capacity for self-rehabilitation to some extent, but it can be accepted that they were also quite severely affected. The generally low economic position of these households is further indicated by the minimal level of personal investment in improving their houses (less than 8% on average), compared to those with loans from agencies (see Chart 4.2.). However, the crucial issue is whether helping some of these households eliminated households that were poorer still and had a more vulnerable household profile (e.g. female-headed, widowed, elderly without family support, etc).

Chart 4.5. Distribution figures for households receiving post-disaster rehabilitation housing



HH 6 in Chart 4.5. is an exceptional household that did not receive an individual grant house. After the major floods of 1988, this household received a house intended to be used as a community flood shelter, and it was an expensive structure compared to most types of grant housing. The household allowed the shelter to be built on its homestead land in exchange for use during normal circumstances and for allowing local households to take refuge there during floods. This household was economically better off than most of its neighbours (and also most of the other cases of post-disaster grant housing); it was chosen to provide support to the local community.

Hence it does not strictly qualify as a case of post-disaster rehabilitation in the same sense as the other households.

4.4.1.2. Divergent aspirations: agency versus household

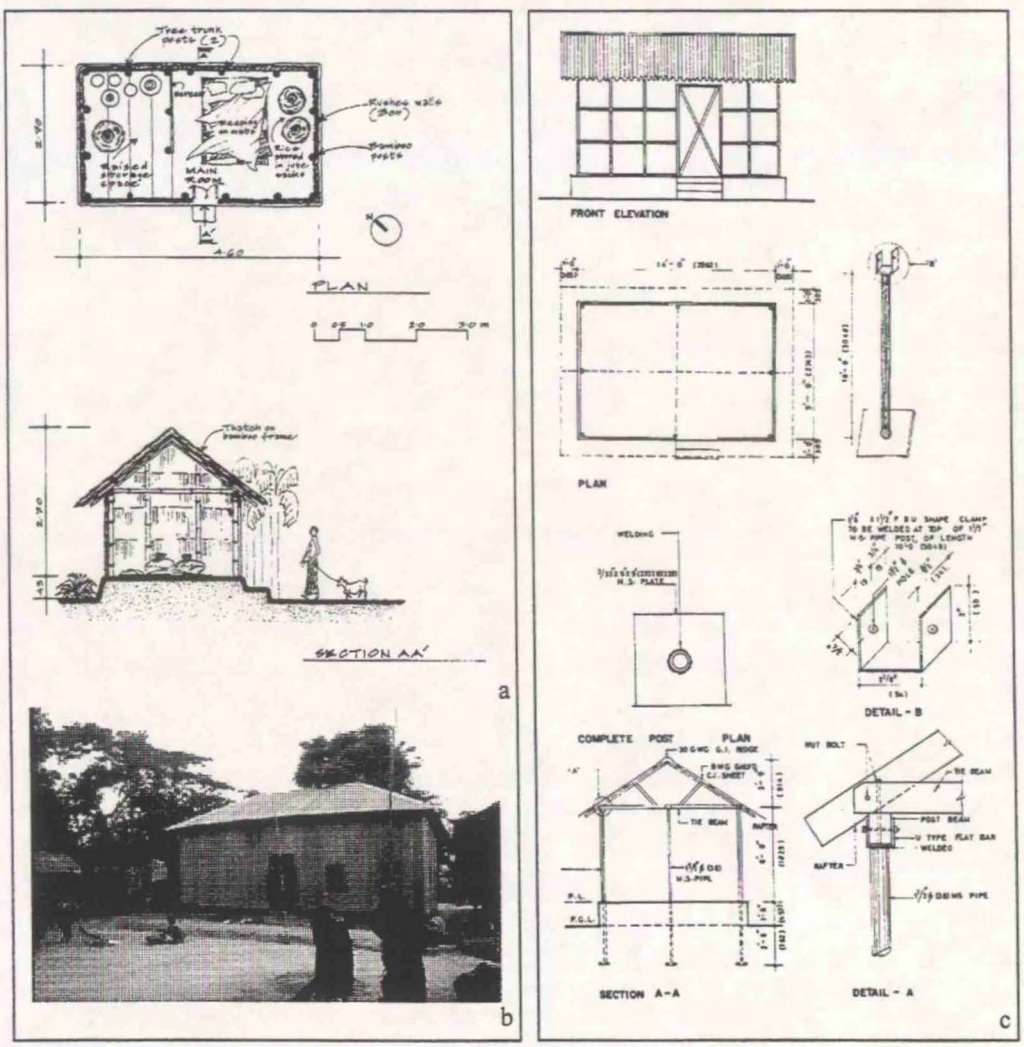
In spite of the potential of grant housing to alleviate sufferings of poor households, it is important to understand whether grant housing is actually a priority for these households. It has been documented in the past that poor households provided with a durable house dismantled it and sold the components to buy assets such as livestock and thereafter built and lived in a traditional *kutcha* type house (Chisholm 1979, p. 68). Such cases were observed also during this study. For example, Banu Khatun's (HH 40) household, as shown in Chart 4.4. above, did not invest any personal funds in the grant house it received. Rather, the household sold off most of the components of the house and built a less expensive house, using the extra money for other household expenses. Another example is Shahjalal Ali's (HH 22) household, a recipient of an EDM house similar to Borhan Uddin's (HH 21). The household did not own any homestead land and was living on Shahjalal's parental homestead as part of an extended household. As the family expanded, it became important to acquire a personal homestead. After receiving the house, the household saved small amounts of money over five years for this purpose, and then added 30% towards the cost of a new homestead land and a new thatch house by selling the EDM house components. For this household, a grant house assisted in acquiring a commodity, in this case land, a priority of the household. In the same area, nearly half of the recipients of EDM's more than 1100 houses had sold off house components to acquire commodities which they held to be of higher priority. Many invested their own savings, in addition to the funds acquired by sale of the EDM components, to obtain their desired objectives.

In spite of these households benefiting according to their preferences, this mode of transaction was incompatible with the aims of the providing agency. EDM's intention was to provide an improved and stronger house to resist future hazards; selling off the components defeated this purpose and has led to considerable aggravation for EDM personnel. However, this should not undermine the need for post-disaster grant housing to rehabilitate poor households. It is important to consider the type of house that was provided. Possibly, rebuilding houses similar to former houses destroyed in a disaster can circumvent the problem of sale, if an agency is interested in doing so. In an evaluation of the WVB project above, provision of fewer improved houses instead of a larger number of traditional *kutcha* type houses was considered a sensible policy decision (Mitchell and Slim 1990, pp. 41-42). However, subsequent to the evaluation it was found that a large proportion of the WVB houses were sold off. Thus instead of providing improved housing at a higher cost, thereby restricting the number of households that could be assisted, a larger number of less expensive traditional type houses could have been provided, if the agency wished to prevent sale of grant housing. In the case of ASA cited above, this agency experienced similar problems when improved non-traditional grant housing was provided. From this experience it revised its policy and in the 1996 tornado rehabilitation in Tangail traditional semi-*kutcha* type houses of CI sheet roof and bamboo walls were provided. This is somewhat more durable than a traditional thatch

house, but it is a model common in rural areas among households that can afford it. Many poorer households aspire towards this model. This decision served effectively to rehabilitate many affected households, without compromising ASA's objective.

From the point of view of recipients of saleable houses, the policy decision to provide such houses is acceptable from a different viewpoint. It was viewed as an item that served to further the aspirations of these households, though those were different from the objectives of the agency, and as such the households were pleased to receive such an item. As Shahjalal Ali (HH 22) commented: 'Even if a grant house is of poor quality, it is good. We are grateful for the house they [EDM] gave us, it saved us.'

Fig. 4.16. Shahjalal Ali's (HH 22) house (a) after selling his former EDM house (c); another household built a CI sheet house after selling its EDM house (b) *(drawings in c excerpted from EDM undated)*



4.4.1.3. 'Relief-culture'

One of the aspects of grant housing is that it had an inherent possibility of creating dependency in a country such as Bangladesh. Extensive input of welfare programmes in Bangladesh has created what many NGO fieldworkers term a 'relief-culture'. This is further supported by the observation

that on many field visits, the presence of the interview team was perceived as a sign of upcoming welfare projects. Time and time again, the researcher was requested by villagers for a grant house or other welfare items, or to recommend such requests to NGOs. It might be relevant here to note a comment regarding dependency, expressed by a participant in a workshop relating to the flood-rehabilitation programme of WVB:

> ... dependency is an important part of many types of relationship and not necessarily a negative one. WVB were dependent on donors for funding emergency programmes for instance. In turn WVB projects were dependent on sponsors and the community were dependent on WVB. Both had legitimate expectations and legitimate dependency. Global systems of patronage were a fact of life.
>
> (Mitchell and Slim 1990, p. 72)

Vignette 4.5. Researcher or provider?

Locating some large houses that appeared interesting, close to the AG-WVB project in Kurushkul, the researcher decided to carry out an interview there with a household that built its own house. This turned out to be a difficult interview as the researcher was unfamiliar with the local dialect. A WVB fieldworker in the research team assisted quite a bit in interpretation, but even though he had lived in the area for a long time, he was not a local, thus he began to tire after a while. A local villager, Rohim Ali, present during the interview tried his best to help; although there were still gaps in communication, his speech was easier for the researcher to understand. He was a lively man, he made the children laugh and he appeared to be the local clown.

When helping during measurement of the chosen house, Rohim urged the researcher several times to visit his house. He seemed to be under the impression that the researcher's visit was associated with provision of new grant housing, a common assumption experienced in many other field visits. Even though the reason for the field visit had been explained at the outset, it appeared that it had not been accepted. This interview was towards the end of the researcher's field study period, and having grown somewhat weary of such requests on many other field visit, he excused himself.

On the way back, the villager pointed to his house over the hills. It appeared to be a very flimsy structure and appeared significantly poorer than the house just recorded. The researcher felt a strong twinge of guilt: the research was essentially about low-income households and during this field visit he had neglected a potentially important household. Even this research could not avoid being affected by the 'relief-culture'.

This certainly highlights the wider issue of dependency as a global paradigm and the mode of operation of many NGOs within that paradigm. However, what this argument takes for granted is the continuity of international funding; it does not take into consideration the question of what happens if funding is reduced or discontinued. It is obvious that international funding is financially precarious. Unless funds obtained are also harnessed productively instead of only providing grants for housing, it may not be possible for an agency to expand its operation and outreach; changing financial circumstances in the international funding climate may compel it to discontinue or limit its operation. As mentioned in Section 4.3.1.4., extensive provision of grant housing by EDM after the 1989 tornado created the notion among villagers that they would receive all future input as welfare. Thus it had become almost impossible for EDM to carry out a credit programme as a subsequent extension of its rehabilitation programme. When EDM originally embarked on its rehabilitation programme in the area, it had envisaged the extension of a long-term community development programme (Uddin 1993, p. 1). However, this objective was greatly impaired by the 'relief-culture' it helped to create, and funding for a long-term housing credit programme was discontinued as a result of this experience.

4.4.2. Settlement programmes for the landless

The government Adarsha Gram (literally 'ideal village' in Bengali) is an extensive and unique programme with several specific features. Firstly, it combines land as part of a housing programme; unlike exclusively NGO programmes, the government has the power to utilise public (*khaas*) land for this purpose. Secondly, this is not a rehabilitation programme in response to natural disasters, but an on-going development effort to address the problems of landlessness and homelessness. Thirdly, although there is the possibility of provision of loans to beneficiaries for purposes other than housing after they are settled, unlike credit programmes such as the Grameen Bank, this is a welfare programme and does not attempt to recover costs. This is the only extensive programme in Bangladesh which provides land and housing grants to settle landless households. This section deals with this programme.

Box 4.4. The Adarsha Gram Programme

As a result of various land reform initiatives in the 1980s, the government initiated the *Guccha Gram* (cluster village) Programme in 1987 and built the first cluster village in 1988. The basic concept is to settle landless households as a rural community of 20-300 households on government land (*khaas*). Land lying fallow and unutilisable is developed by the government for the settlement of these households. Each household is provided a minimum of 0.8 acres of homestead land with a house, kitchen and latrine, and a tubewell to be shared by 15 families. Efforts are made to provide households with agricultural land, community facilities and opportunities for generating income. NGOs are involved in the long-term social development of beneficiaries. In 1991 after a partnership between the European Commission (EC) and the Bangladesh Government, the programme was renamed the *Adarsha Gram* (ideal village). By 1996, more than 600 villages were built, in 61 out of 64 districts in Bangladesh and more than 29,000 households were settled (Bangladesh Ministry of Land 1995).

4.4.2.1. Landlessness as the targeting criterion

Provision of land is the main component of the Adarsha Gram (AG) programme, and in a context of high competition for land, the possibility of obtaining free land is an attractive prospect for many poor rural households. The basic criterion for eligibility is landlessness, defined by the 1984 Land Reform Ordinance in descending order of priority as:

a. Firstly, those who have neither homestead land nor any agricultural land, though the family is dependent on agriculture.
b. Secondly, those who have homestead land but no agricultural land, though the family is dependent on agriculture.
c. Thirdly, those who have agricultural and homestead land but in total less than 0.50 acres and are dependent on agriculture.

(Rahman 1993, p. 35)

In addition, the AG programme emphasises selection of specific marginal and vulnerable groups:

a. Those who have become shelterless due to riverbank erosion, and their family members are dependent on agriculture.
b. Family members of the *shaheed* [martyr] and invalid freedom fighters who are dependent on agriculture and share-cropping.
c. Widows and divorced women.

(Rahman 1993, p. 36)

In spite of well-meaning intentions, the criteria enumerated above contain certain anomalies. As the programme stems from an initiative for agricultural land reform, it assumes that rural livelihood is based on ownership of agricultural land, and uses it as a proxy indicator of income. It does not take into consideration that a household may not own any land, even homestead land, yet are able to earn a relatively high income by non-agricultural employment; this is evidenced from several studies (Hossain 1995, pp. 62-65; Ullah 1996, p. 46). Such a case was Shopon Mia's (HH 35) household, living in an AG settlement. Previously, the household did not own any land and lived in a rented house. However, Shopon had a stable and relatively high income from plying his boat, and paying rent did not present a problem:

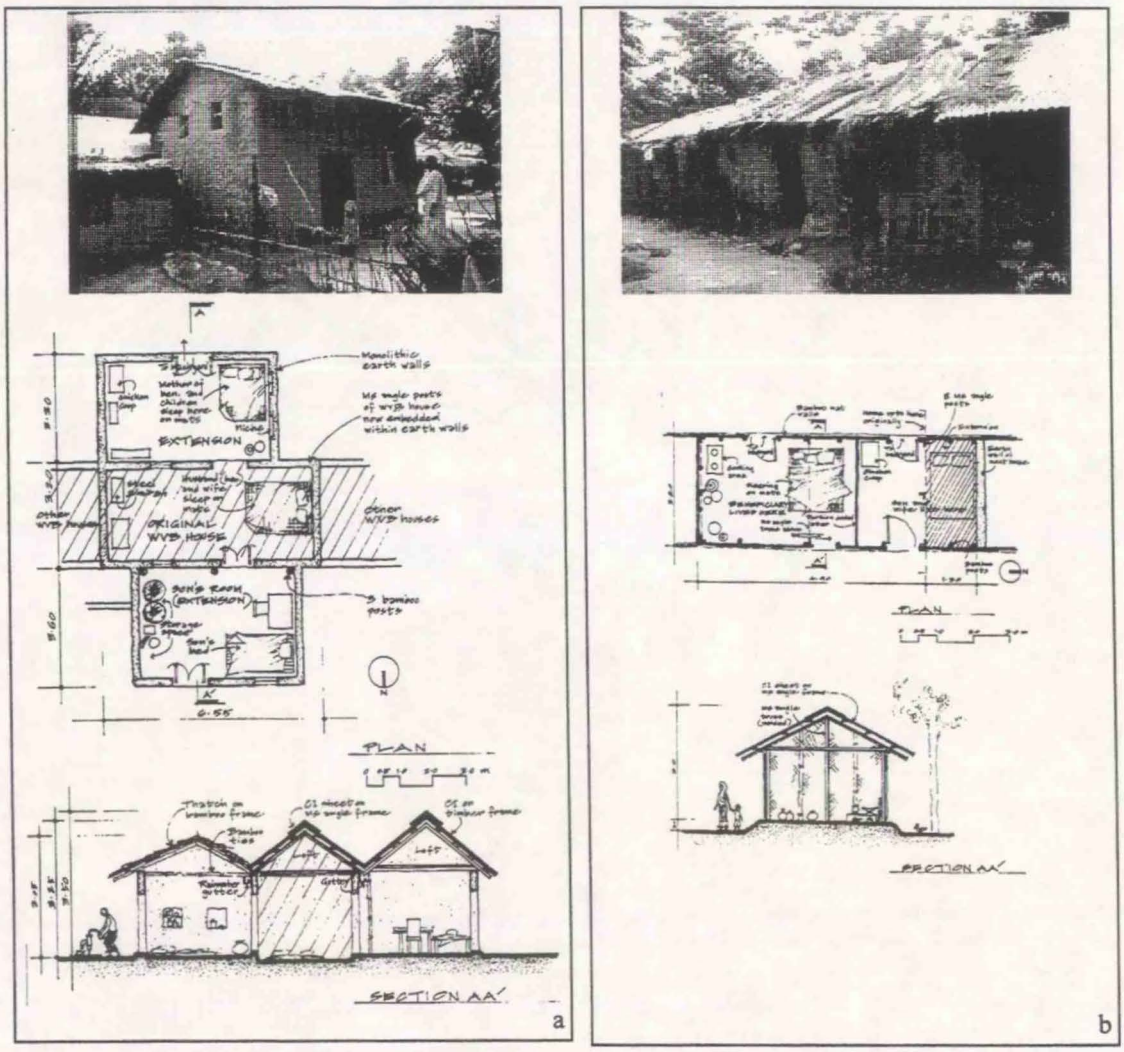
> We could have built a house on our own, but we didn't have any land, so we lived in a rented house for Tk 200/month. We couldn't afford to buy land as it is too expensive in this area; but, I guess, if we saved for a long time, maybe we would have eventually been able to buy a small piece of homestead land.

Even after he lost his boat in the 1991 cyclone, Shopon managed to earn a steady income as a salaried boatman. He preferred this job to buying a new boat, as there was less risk of losing employment due to natural disasters, and he earned relatively well. He had invested substantially, nearly 1.5 times the cost of the grant house, over the years in extending the grant house provided to him. Shopon's household is a clear example of inappropriate targeting due to selection according to the criterion of landlessness. Even though agricultural employment accounts for a large proportion of livelihoods in Bangladesh, 66.4% in 1990 (about the time this project was built), a considerable part of the population (33.6% in 1990) is engaged in other occupations (Gunthorp 1998, p. 97). The proportion of the population engaged in non-agricultural employment had increased by 2.5% since 1990 to 1996, indicating the gradual expansion of this sector of employment (BBS 1997, p. 159). Thus, if the intention of the programme is to reach very poor households, it would be necessary to assess the economic position of households by taking into consideration the diversity of incomes other than through land ownership or agricultural employment.

Nonetheless, if Jannatara Islam's (HH 34) house in the same AG settlement as Shopon Mia's is considered, a great contrast can be observed: Shopon's house was among the largest and best built houses in the settlement; Jannatara's was among the smallest and flimsiest. Many households in the settlement that could not afford to do so had replaced the original bamboo walls of the house provided, except for the poorest such as Jannatara's. Her household did not have a male adult member, hence it was particularly vulnerable; she sometimes had to beg for a living. After her husband died, she did not have the means to repair the thatch house which her husband had built on land they did not own, and was compelled to live with her children in that dilapidated house. She did not even know about or apply for the AG programme. Fieldworkers found her in that condition and allocated her a place in the AG settlement. In spite of her difficulties, here she had tenure security and a somewhat better house. Thus the AG programme does manage to target such deserving households, as identified in its agenda. However, this research cannot substantiate the

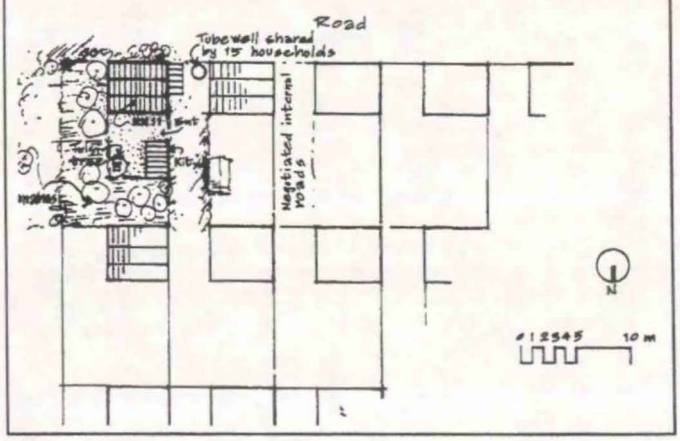
extent of such targeting in this large scale programme; from this study it appears that there is considerable divergence and inconsistency between the objectives and outcome of the programme.

Fig. 4.17. Shopon Mia's (HH 35) and Jannatara Islam's (HH 34) houses (a and b), among the largest and smallest houses respectively in the AG-WVB settlement in Chittagong



A crucial issue is that many rural households can afford to build a house, but they cannot buy land. Thus there is pressure from such households (although better off than many other households) to benefit from the AG programme. Households that have the capacity to manage on their own tend to pre-empt the programme, consequently depriving those who are in worse condition. Shudipto Chandra Ray's (HH 11) household was such a case. Although his household did

Fig. 4.18. The AG programme grants 0.8 acres of homestead land to each beneficiary household, such as Shudipto Chandra Ray (HH 11), an attractive prospect in a context of high competition for land

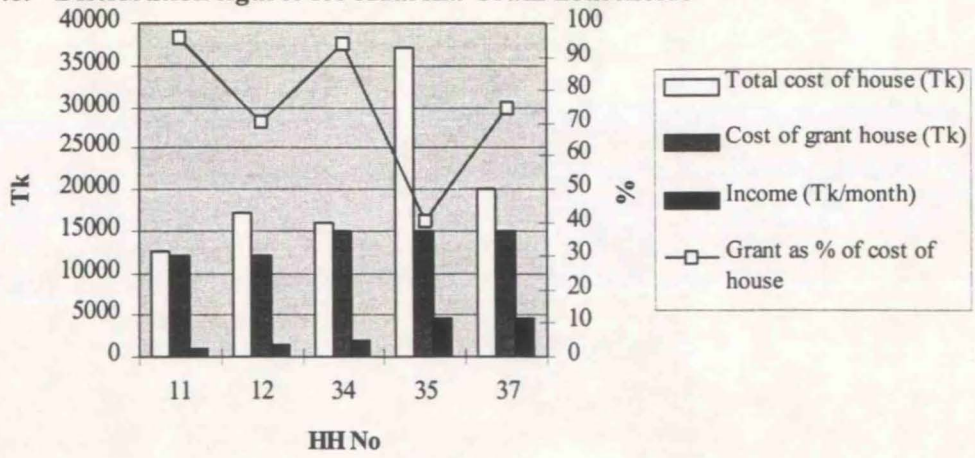


not own land, his mother had a large property, where his household used to live before it benefited from the AG programme; his two sons continued to live there. In spite of a low income, it was steady enough for Shudipto to avail himself of a loan from the NGO operating in the AG settlement. According to him: 'I would have preferred to get a housing loan to build this house; I could afford to repay it. But I couldn't afford to buy land, it would have taken me ages to save enough for that.' Thus his interest in the programme stemmed from the aspiration to obtain land; the house provided was secondary. He had to pursue his application quite persistently before he was alloted a place; he still had not received a deed for land at the time of the field visit, four years after completion of the project. This possibly indicates that he was allocated to the programme despite his ineligibility, probably through connections or other unethical means, resulting in inconsistent behaviour from officials of the programme. Even though there was sufficient space in Shudipto's mother's large property, and his sons continued to live there, Shudipto and his wife lived in the AG settlement, possibly for fear of losing their land by occupation by others.

It is necessary to discuss the aim of the AG programme to support households affected by riverbank erosion. This is quite an important target group; unlike other natural disasters, riverbank erosion does not attract international response as it is less sensational. As documented by Rahman (1993, pp. 13, 75), and also observed during field investigation for this research, even wealthy landowners are affected by riverbank erosion and are rendered homeless and deprived of a source of income. Nevertheless, sources and levels of household income make a difference, even if households are affected equally by riverbank erosion. For example, Sajjad Ali's (HH 37) household benefited from the AG programme after it lost land due to riverbank erosion. The household did lose its homestead and thus required a new one, but according to Sajjad, it could possibly have afforded an institutional soft loan to buy land, if such a loan were available. Sajjad had a relatively high income, among the highest in this research sample, and it can be questioned whether it is equitable for a such a household to benefit from a programme intended for much poorer households. However, in the absence of an institutional alternative, the available recourse for the household was benefit from the AG programme after loss of its land.

These targeting inconsistencies are illustrated in Chart 4.6. below, which shows that within a small sample of households from different parts of Bangladesh participating in this programme, houses of very similar cost were provided to households with varying levels of income and capacity to invest personal funds in house construction. Thus, in spite of the intention of the AG programme to assist very poor households, loopholes in the selection criteria and process prevent realisation of this intention in practice. The mode of selection of beneficiaries of the AG programme as it stands is too simplistic. The simple criterion of landlessness leads to problems of targeting.

Chart 4.6. Distribution figures for Adarsha Gram households

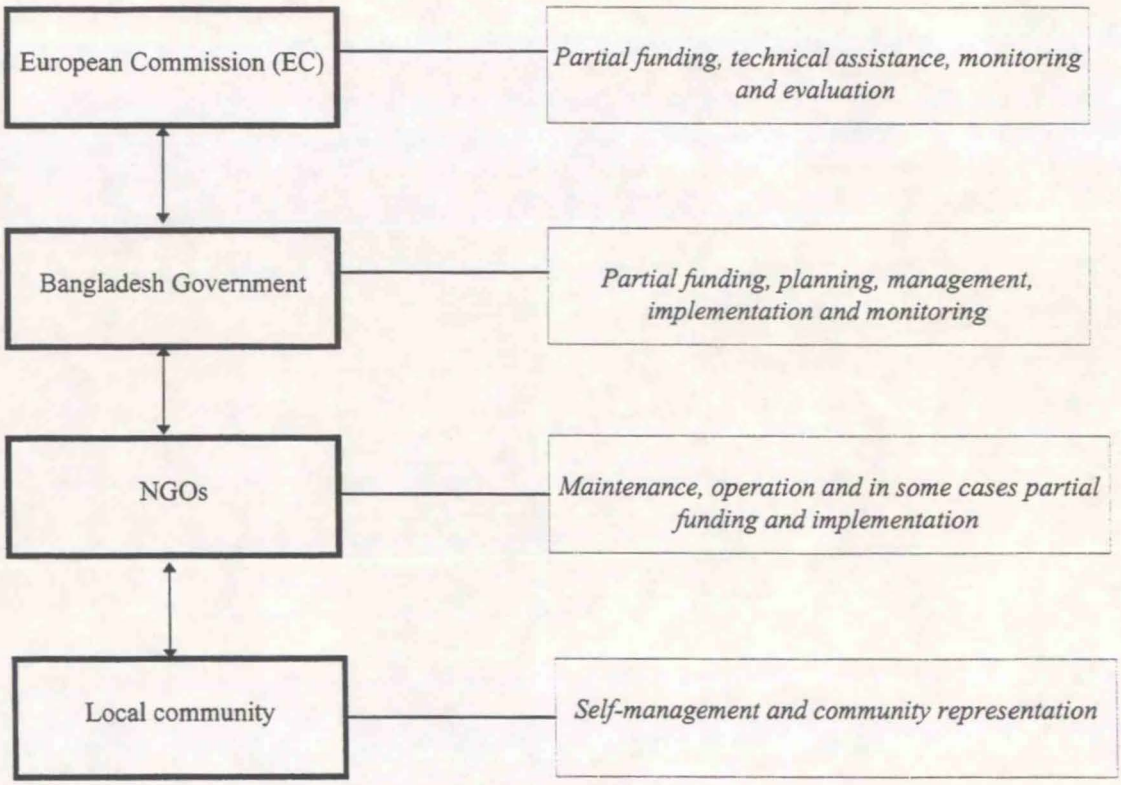


4.4.2.2. Financial sustainability

The AG programme consists of a four-tiered partnership initiative between the European Commission (EC), the Bangladesh government, NGOs and the beneficiary community. The organogram constructed below (Fig. 4.19.) to show the AG partnerships indicates a crucial point: the flow of funds principally from the top level to the bottom, without any significant upward flow. It should be mentioned, however, that the government had invested Tk 35 million before its partnership with the EC, and until 1995 its contribution was 36% of the programme costs (Ministry of Land 1995, appendix fig. 8). Nevertheless, a significant part of the funds of the programme had been obtained from the EC; the partnership has been extended for another five years from 1996. A pertinent question is: what will happen after this period is over? Partner NGOs sometimes contribute a substantial share of project costs, especially if they happen to be large NGOs with access to international funds. However, this may not always be a dependable and continuous source of funding. It cannot be realistically expected that the partnership and its funding arrangement, that is, through EC and other international funding, will continue indefinitely. As the programme does not recover costs, in order for it to continue in the absence of external funding, the government would have to invest further revenue earnings in it - not feasible in the face of the multitude of demands on government expenditure in the context of severe resource constraints. This crucial issue of financial sustainability is central to the AG programme (for a critical review of this aspect of the programme relating to the global context see Ahmed 1998a).

The AG programme was planning a new initiative to begin a credit programme in 1997. It is beyond the scope of this research to assess this initiative, but it appears that it might add a new dimension to the programme. Although this may begin to address financial sustainability of the programme by incorporating cost-recovery, this initiative might eventually benefit only households in a stable economic position. A policy approach to integrate the credit scheme with the core welfare objectives of the programme, as well as a long-term vision, seems lacking. This casts doubt on the effectiveness of the new initiative.

Fig. 4.19. Organogram of Adarsha Gram (AG) partnerships



There are about 10 million rural households in Bangladesh owning less than 0.5 acres of land (that is, 'functionally landless') (BBS 1995, p. 10), and by 1996 the AG programme benefited less than 0.3% of such households. It is inconceiveable that a long-term policy of assisting such a large population group can both expand and continue to depend on external funding without provision for cost recovery. Given the necessity for providing grants to many poor households, external funding cannot be the sole basis of the long-term operation of a programme.

4.5. SELF-FINANCING: THE TRADITIONAL OPTION

In spite of the expansion of agency-based programmes in recent years, the great majority of rural households in Bangladesh still finance construction of their houses from informal credit sources or with personal funds. The sample in this research is not a representative proportion of such households, as the research is principally concerned with the effects of agency-based programmes. Nevertheless, a small sample of households from different rural areas of Bangladesh that financed house construction on their own has been included, to obtain a wider perspective and to have a comparative basis for understanding the housing process.

4.5.1. Household funding sources

There is a range of sources of funds utilised by households to build houses in the typical 'self-help' mode without institutional involvement. While many households seek funds from informal credit networks, in the absence of such networks, households are compelled to secure funds on their own. For poor households lacking adequate savings for house construction, a typical strategy is to sell personal belongings or assets.

For example, after losing her husband and being unable to obtain employment, Shaheda Khatun (HH 36) sold off the homestead land and house and migrated with her children to a rural peri-urban area close to Chittagong city, where she had relatives and could benefit from their social networks and support. Using the funds from sale of previous property, she built new houses and established a homestead without a legitimate permit on public (*khaas*) land, close to an Adarsha Gram (AG) settlement. She chose to settle there with the hope of obtaining a supposedly adandoned house in the AG settlement, and hence obtain secure land tenure: 'We were attracted to this area because of the hope of getting free land like those people in the AG settlement.' Although with the funds she had, about Tk 40000, it may have been possible to buy a small piece of homestead land, she decided instead to invest more than 60% of that money in building two well-built, large houses (one for her son who has grown up).

Vignette 4.6. The helpful relative

After Shaheda became a widow, she could not find any work to support herself and her three children. Thus she sold off the family property she inherited from her deceased husband and migrated close to Chittagong city where her sister lived. Shaheda and her children moved into her sister's house on the bank of the Karnafuli river. Shaheda's sister's household had a low income and a small house, and it was very difficult to accommodate extra people. However, in spite of the difficulty, her sister tried to assist to the extent that she could, helping the new migrants to find means of establishing a new life; 'I can't throw out my own sister', she had said.

Soon after that, this house and the land on which it stood was washed away by riverbank erosion, and Shaheda's family once again became homeless, as well as her helpful sister's family. Together they moved close to a nearby Adarsha Gram (AG) settlement where a distant relative lived. They then established homesteads on public land they did not own, hoping to obtain legal tenure some day as the residents of the AG settlement had done. Their relative in the settlement helped them to orientate themselves to the area and to utilise available opportunities.

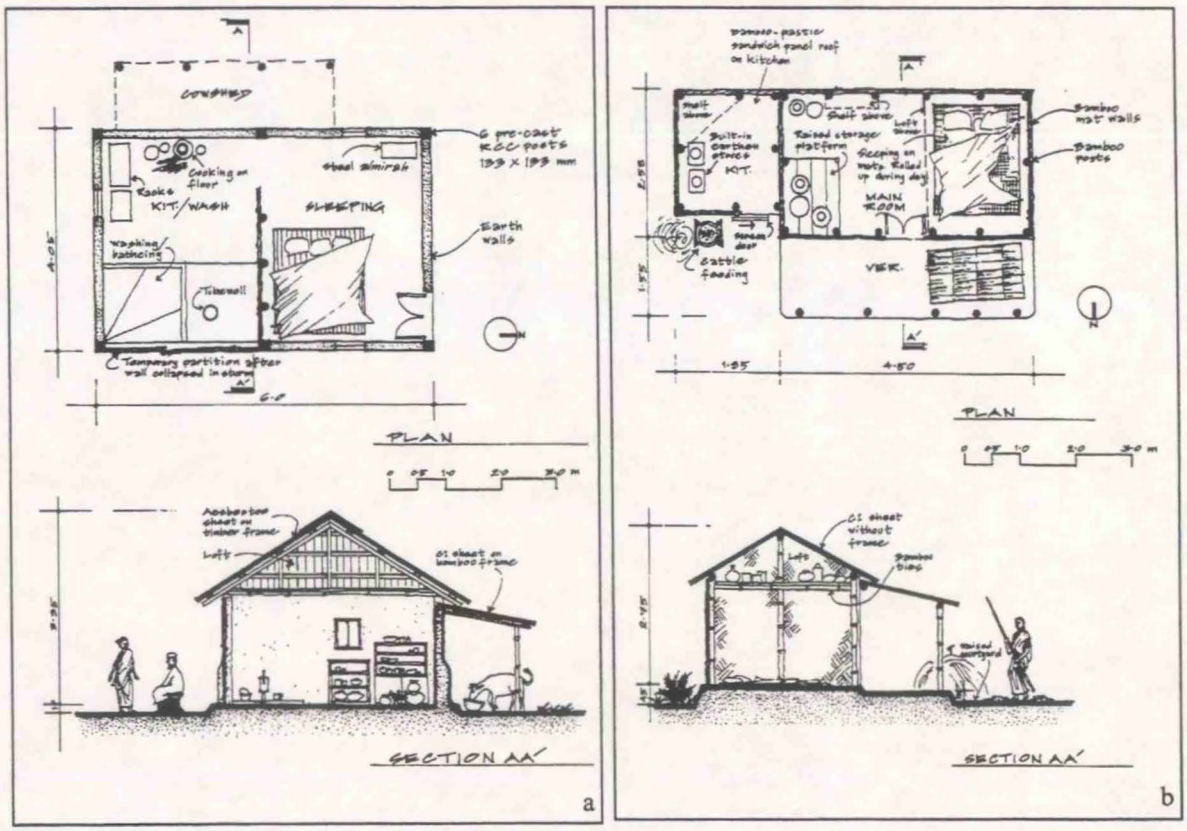
This is a typical example of a familial support system for rural migrants. Without such support, inter-regional migration would be almost impossible.

At least Shaheda's household had some land to sell and start a new life, however uncertain that might be, but many households are in a worse position and have to sell possessions of sentimental or personal value. Koruna Rani Shutradhar's (HH 19) household saved for about a year from her husband's income, but could not save enough to build a house that would modestly fulfil the household's needs and aspirations. In order to supplement their savings, Koruna sold her gold earrings and they then built a house. In Bangladeshi society women's jewellery are generally family wedding gifts, passed down through generations, and have high sentimental value; selling jewellery is almost a last resort.

If Koruna's household had built the house entirely out of natural materials, it would not have been necessary to sell her jewellery. Because CI sheet was used for roofing (even though, in this case, without framework), and comprised about 70% of the cost of the house, the total cost exceeded the limits of the household savings. The household was part of Koruna's husband's patrilocal extended family, sharing a large homestead. Several of the houses of her brothers-in-law were built of CI sheet, and this had possibly created pressure on her household to maintain status by

constructing a CI sheet roof. This aspiration for status, especially that derived from CI sheet (as well as its need for lesser maintenance than natural materials) is a strong reason for households to seek loans from agencies to fulfil this aspiration, as CI sheet contributes to a much higher cost than most household savings permit. Koruna's household did not want to take a loan because of fear of inability to meet regular repayment: 'My husband's income is irregular, his health is frail and he is often ill. We don't dare take a loan from an agency, because we won't be able to keep up with repayment.' Hence the alternative was to sell assets the household had, in this case Koruna's jewellery.

Fig. 4.20. Shaheda Khatun's (HH 36) and Koruna Rani Shutradhar's (HH 19) houses (a and b respectively), built with household funds



On the other hand, for a household such as Jagannath Ray's (HH 4), improving its income steadily, it was feasible to contemplate an agency loan and thereby acquire manufactured materials such as CI sheet. Jagannath had an expanding and moderately successful rice trading business; although at the time he constructed his house his income was modest, he expected it to improve steadily. Thus he was interested in seeking a loan from an agency to upgrade his house by replacing the thatch roof with CI sheet. This desire for status and durable building materials is consistent with most rural household aspirations. It had been further contributed to by the availability of loans from NGOs, now a widespread phenomenon in rural areas, consequently raising expectations of villagers by offering the possibility of fulfilling their aspirations. However, as noted in Section 4.3.1, such loans are not feasible for a large segment of the rural population, which therefore has to acquire funds for house construction from other sources, often selling their minimal assets.

4.5.2. Land tenure as a basis for household financial investment

One of the basic preconditions for a household to invest substantial funds in house construction is secure land tenure. A perfect example of this was observed during field investigation in the AG settlements in different parts of Bangladesh. After granted landownership, beneficiaries of the programme had built extensive additions and extentions to their houses, sometimes well exceeding the cost and size of the grant house provided by the programme. In spite of not having legal tenure, Shaheda Khatun's (HH 36) household was secure in the conviction that it would eventually be recognised and granted tenure similar to the adjacent AG settlement beneficiaries. Hence, the household invested a substantial amount of funds in house building, living illegally on public land without serious fear of eviction.

Even if a household does not own land, if tenure security is provided, it can greatly enhance the household's incentive to invest considerable funds and effort in house construction and upgrading. For example, Lota Bala's (HH 28) household was part of a small Christian community that had settled on Catholic Mission land. Possibly most of the households of this community, or their previous generations, had converted from Hinduism and thereby were allowed by the mission to live on this land; these households did not own the land, they had merely been allowed to live there. Nevertheless, they felt sure that they and their future generations would be able to continue living here, having received verbal assurance from the mission to this effect. Hence, many of the households that could afford it, such as Lota's, substantially invested in house construction. Lota's house was large, with an RC post structure and CI sheet roof and a back wall of CI sheet; the household planned gradually to use CI sheet for the other walls.

Vignette 4.7. The household with self-initiative

Lota Bala's household did not have easy access to a NGO credit programme. When the household required funds to rebuild its dilapidated bamboo and thatch house, it did not have enough savings and hence approached a neighbour for a loan. However, the neighbour refused and the household had no alternative but to wait and save funds on its own. Both Lota and her husband began to work hard, Lota tailoring clothes and supplying them to traders, while her carpenter husband was fortunate to find several construction jobs. Within a few months the household had enough savings to build a large house.

Lota's husband seemed to be quite a skilled builder. In addition to carpentry, he knew how to make the RC posts and sanitary latrine. He managed to acquire second-hand CI sheets through his contacts as a carpenter, sometimes receiving them in kind for his services. In addition, construction labour cost was minimised as he almost single-handedly built the house, with some help from Lota and other family members. Thus a large house was built with RC posts and CI sheet roof, using a comparatively small sum of Tk 5500.

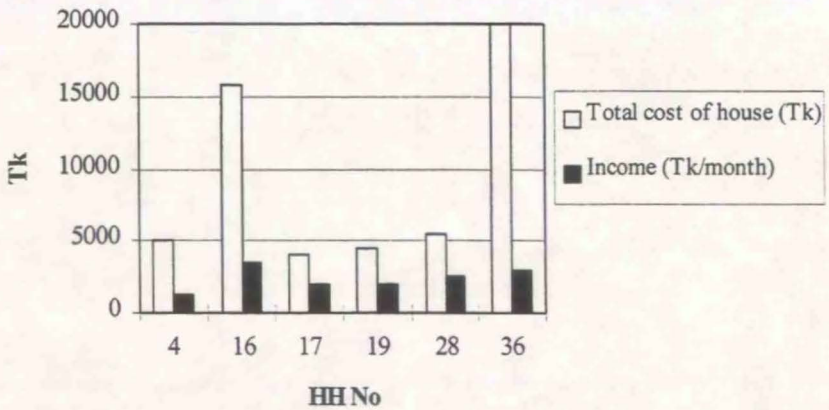
This household is an example of a high degree of self-initiative, most effectively utilising the skills and resources it had. The achievement of building a house without external help has endowed the household with a sense of pride, reflected in Lota's comment: 'We had to wait to get the money; we worked hard to save on our own. Now we are happy that we could build our own house and don't owe money to anybody.'

4.5.3. Affordability in the self-financed context

Most self-financed houses built by low-income households tend to cost less than houses provided by agencies, as can be seen in Chart 4.7. below. There are, of course, exceptions such as Shaheda's (HH 36) house mentioned earlier, built with funds from sale of previous property. Slightly higher

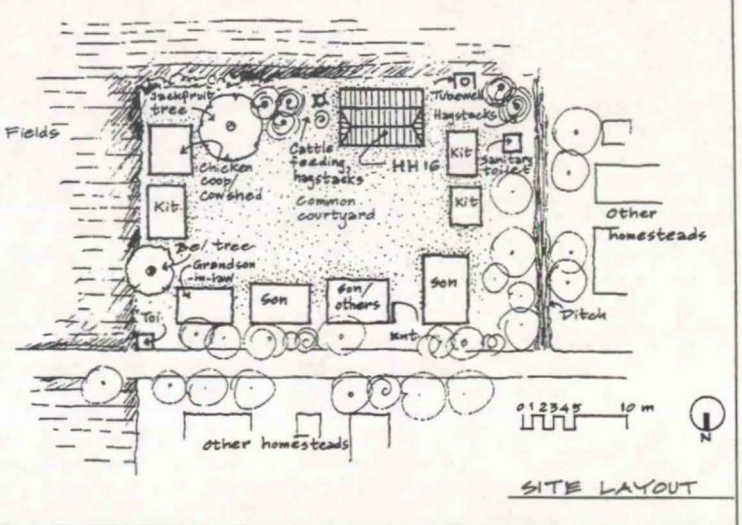
and stable income can sometimes make a large difference in terms of the ability to invest personal funds, demonstrated by Rashid Ali's (HH 16) household. Generally households such as Rashid's, that own agricultural land exceeding 0.5 acre, are not eligible for most NGO or grassroots credit programmes. However, many such households may have comparable or lower incomes than beneficiaries of credit programmes. Landownership as a proxy indicator of income and household economic condition is inadequate, as shown in Section 4.4.2. This indicates that in the absence of institutional credit, households that have a modest but steady income from agricultural land can also build houses comparable to those acquired in housing programmes, thus undermining the basis of provision of housing credit to households with similar incomes from non-agricultural sources. Rashid Ali had a small landholding and also received remittances from two sons employed outside the village (one worked as a mason in Singapore). Nevertheless, the household's income was less than some of the GB beneficiaries in the research sample. Rashid had managed incrementally to build a large CI sheet house with RC posts with his own funds. When asked about his attitude towards NGO credit programmes, his response was: 'I never felt the need to become a member of any NGO. I can manage better without their help.'

Chart 4.7. Distribution figures for self-financing cases



Nonetheless, it should be noted that Rashid's household belonged to a large extended family living on the same homestead, and in addition to other support structures, his household derived considerable help from this arrangement. For his household not to seek support from an agency was a viable option. Such an option has additional benefits: no external official restrictions or regulations to follow, no paperwork, etc. For the majority of rural households that are not literate, self-funding implies that they do not have to deal with bureaucracy, often an encumbrance for such

Fig. 4.21. Rashid Ali's (HH 16) large extended family homestead



households. Most importantly, self-funding permits complete control by the household in design and construction, allowing households to build according to their needs and preferences.

For less fortunate households than Rashid's, those that are on their own and do not have a support network nor a robust income, funds for house construction from external sources is often the only alternative. Close to Rashid's homestead lived Momota Banu (HH 17), whose household owned a self-financed house. Built a long time ago, the house had begun to deteriorate and the household did not have enough funds to repair it. Hence, the household contemplating an institutional loan and believing itself capable of meeting repayment. This transition from self-financing household to prospective credit beneficiary is a crucial aspect relating to the expansion of the institutional credit sector. One of the main concerns of this study is to understand whether the expectations for building houses of a diversity of such households is met by the expanding credit sector.

4.6. COMPARATIVE ANALYSIS OF FINANCING TYPES

In this section the results of statistical tests to compare the different types of financing are discussed. As the sample for the self-financing type [no. of households (N_3) = 6] is not sufficiently robust for significant statistical analysis, it was decided to carry out t-tests to compare the other two main financing systems: loan (N_1 = 19) and grant (N_2 = 15). Nevertheless, means of all three financing types have been displayed and statistical error bar charts have been generated to compare the means. As the main emphasis of this research is on a qualitative understanding of a small number of cases studied in depth across a range of programme and household types, the number of cases chosen does not lend itself to highly reliable and representative statistical analysis. Also, although very close estimates, the numerical figures used for the analysis are not totally precise because rural households do not maintain such exact accounts. The statistical tests carried out thus only identify some basic trends relating to some of the qualitative findings.

Drawn out of the preceding sections of this chapter, three main quantitative variables were found relevant for understanding financing mechanisms: total cost of house (external input plus personal investment by household), household monthly income and personal investment by household. The significance of any differences between the two main financing types, loan and grant, has been tested for each of these three variables. In addition, the correlation between these three variables has also been tested across the entire sample. The financing types have been further tested according to two derived variables: personal investment as percentage of cost and household monthly income as percentage of cost.

4.6.1. Financing types and cost of house

The cost of house bears a significant correlation to monthly income across the entire sample of the research (Table 4.4.). This can generally be expected: the higher the income of a household, the more expensive the house. When the cost of houses built by loans versus grants was compared, the difference was not significant at all and the mean house cost in the two groups hardly differed (Table 4.5.). This apparently indicates that although households with a moderately stable income

tended to benefit from houses on institutional loans, grant houses, supposedly provided to poor households, and of comparable cost to loan houses, were supplied not always to the poorest, but to those who could invest substantially in extending their houses, as shown in Section 4.4. on grant housing. However, this analysis is complicated by the fact that within the category of loan, there were households that had taken much smaller general loans and non-institutional loans, consequently building less expensive houses (resulting in the comparatively large Standard Deviation [SD] in this category, shown in Table 4.5.). In any case, supported by qualitative observations, this quantitative analysis suggests that grant housing, according to the sample of this research, generally did not reach the target group of poorest households.

In the small sample of self-financed houses, the mean cost was lower than that of houses built by loan or grant, as indicated by Chart 4.8. However, because the number of self-financing households within the total sample is relatively small, it does not allow for a very strong comparative interpretation of test results; it is possible only to identify trends in very general terms.

Table 4.4. Correlation co-efficients of cost of house, household income and personal investment

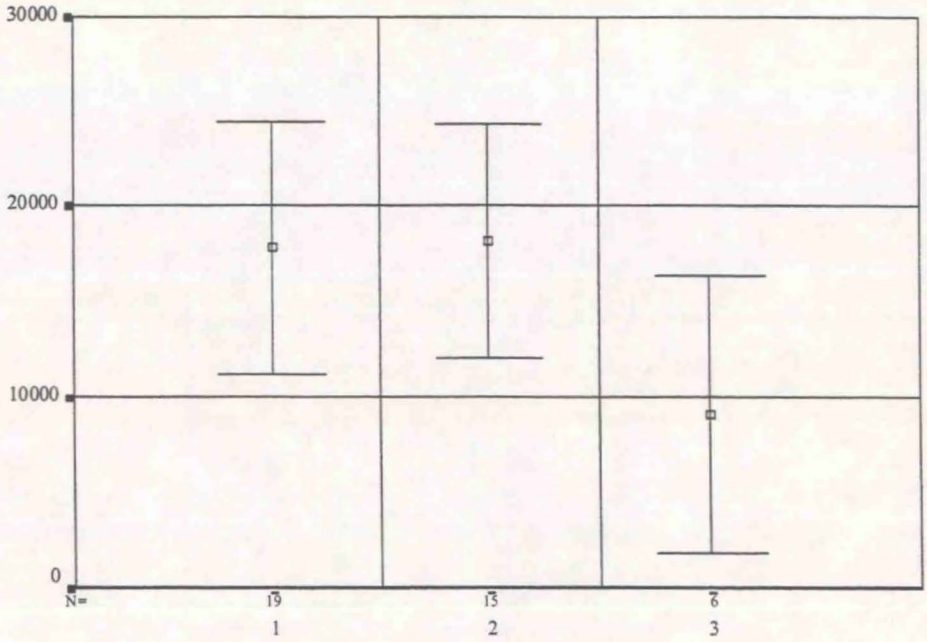
	INCOME	PERS. INV.
COST	0.6313 (0.000)	0.3756 (0.017)
INCOME		0.5393 (0.000)

(Note: The number in parenthesis is the two-tailed significance; n = 40)

Table 4.5. Mean cost of house by financing type

Variable	No. of Cases (n)	Mean cost	SD
COST (Tk)			
Loan	19	17882	13730
Grant	15	18183	10986
Self-financed	6	9138	6942
Mean difference between Loan and Grant =	302		
2-Tail Significance =	0.945		

Chart 4.8. Mean cost of house by financing type



Notes:

1. Confidence interval = 95%
2. Category (X) axis: Financing type
   1 = Loan, No. of cases (N1) = 19
   2 = Grant, No. of cases (N2) = 15
   3 = Self, No. of cases (N3) = 6
3. Value (Y) axis: House Cost (Tk)

4.6.2. Financing types and household income

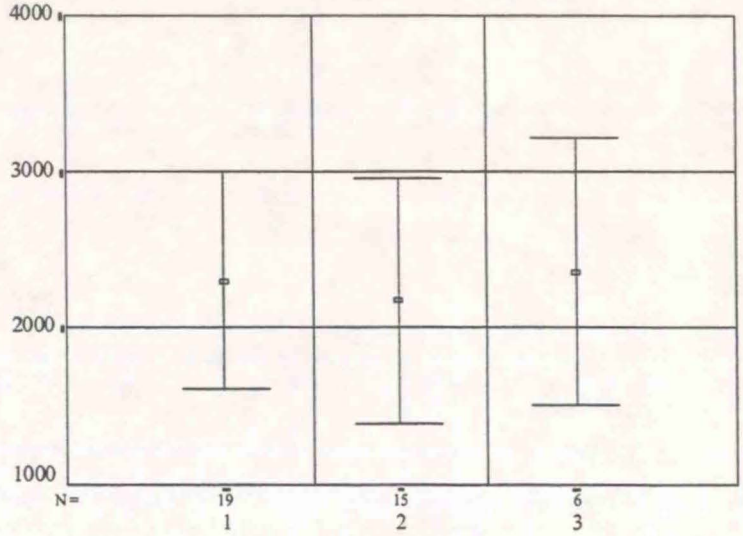
The household monthly income across the entire sample bears a reasonably significant correlation to the amount of personal funds invested by the household during and after construction (see Table 4.4. above). This can generally be expected: the higher a household's income, the more the possibility of the household having disposable funds to invest in consumption, such as house construction, extension and upgrading. There was no significant difference in income between households that had benefited from loans and those from grants; both had mean incomes of similar amounts (Table 4.6.). If households with moderately stable and relatively high incomes were able to benefit from loans, and if such incomes were comparable to those of households that had benefited from grant housing, it is clear that grant housing, essentially intended for a very poor target group, had not actually benefited them. The mean incomes of these two groups is comparable to the mean of the entire sample (Tk 2267.5); some of the poorest households had an income of Tk 700 (see Appendix A.2., Table A.2.1.). This confirms a basic qualitative observation presented throughout the preceding sections of this chapter: on the whole, neither housing loans nor grant housing had generally been able to reach the very poor.

Table 4.6. Mean household income by financing type

Variable	No. of Cases (n)	Mean income	SD
INCOME (Tk/month)			
Loan	19	2305	1442
Grant	15	2180	1419
Self-financed	6	2367	817
Mean difference between Loan and Grant =	125		
2-Tail Significance =	0.802		

Chart 4.9. indicates graphically the comparable mean incomes of households which had taken a loan and those which had received grant housing. The mean income of households that financed their own houses (financing type 3) does appear higher than the other two groups, but the size of the sample ($N_3 = 6$) and spread of income (SD = 817) within this group are not comparable with the samples of the other two groups. On one hand it can be suggested that households that had higher incomes did not seek support from institutional programmes and tended to build houses on their own; on the other hand, some of the self-financing households demonstrated that their incomes were too low for them to risk taking an institutional loan. In the absence of grant housing in their particular areas, some of these households as noted, had to adopt strategies such as selling valuable personal assets to finance house building.

Chart 4.9. Mean household monthly income by financing type



Notes:

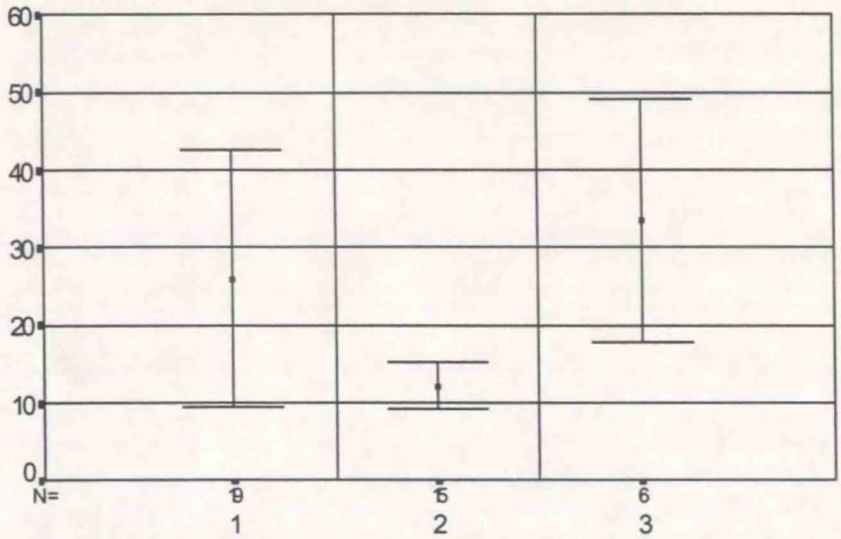
1. Confidence interval = 95%
2. Category (X) axis: Financing type
   1 = Loan, No. of cases (N1) = 19
   2 = Grant, No. of cases (N2) = 15
   3 = Self, No. of cases (N3) = 6
3. Value (Y) axis: Household income (Tk/month)

That incomes were comparable between loan and grant households was further confirmed when household income as a percentage of house cost was compared; the comparison did not yield any significant difference (Table 4.7.). However, it should be noted that the mean percentages varied somewhat between the two groups, unlike mean incomes in Table 4.6. This result was produced because the test for percentages relates income to house cost, unlike tests that independently compare income and house cost. Outlying cases within the sample that built either less or more expensive houses in comparison to their incomes contributed to the divergence.

Table 4.7. Mean household monthly income as percentage of house cost by financing type

Variable	No. of Cases (n)	Mean income as % of house cost	SD
PCT. INC. (%)			
Loan	19	26.0	34.2
Grant	15	12.1	5.4
Self-financed	6	33.5	14.8
Mean difference between Loan and Grant =	13.9		
2-Tail Significance =	0.98		

Chart 4.10. Mean household monthly income as percentage of house cost by financing type



Notes:

1. Confidence interval = 95%
2. Category (X) axis: Financing type
   1 = Loan, No. of cases (N1) = 19
   2 = Grant, No. of cases (N2) = 15
   3 = Self, No. of cases (N3) = 6
3. Value (Y) axis: Household income as % of house cost

The reason for the divergence in results is further evident from Chart 4.10. where the spread is even wider within the smaller sample of self-financed houses. In this category, there were a few households that built either very inexpensive or relatively expensive houses, so that their income

as a percentage of house cost gave rise to very high or low figures, resulting in a broad distribution. The wide distribution in the category of loan is a result of combining very poor households that had taken non-institutional or institutional general loans with households that had a better income and had taken larger institutional housing loans, which meant including a number of outlying cases. Such a diversity of cases had been chosen in order to obtain a greater variety of loan types for qualitative analysis; this has contributed to the statistical results showing a wide distribution. In any case, in spite of the difference between the two groups in the means of income as a percentage of house cost, this difference is not statistically significant, hence suggesting once again that the incomes and house costs of the two groups were somewhat comparable.

4.6.3. Financing types and personal investment by household

The significant correlation between household income and personal investment by household in construction has been discussed in Section 4.6.2. (also see Table 4.4.): the higher the income, the greater the ability to invest personal funds. On the other hand, personal investment did not differ significantly between loan and grant households (Table 4.8., Chart 4.11.), another indication that income was generally similar between these two groups. In spite of its lack of statistical significance, mean personal investment by loan households is more than double that of grant households. This divergence is more clearly expressed when personal investment is shown as a percentage of house cost; there is then significant difference between loan and grant households. Loan households on the whole invested more in relation to the house cost than did grant households (Table 4.9.), indicating that institutional input in the form of loans contributed less to house cost than institutional input as grant. Grant households received more or less well built houses and did not require substantial household investment, whereas loan households generally received some financial input, but had to contribute to a large extent towards house building, confirming this attribute of loan households, noted in Section 4.3.1. on agency loan.

Table 4.8. Mean household personal investment by financing type

Variable	No. of Cases (n)	Mean personal investment	SD
PERS.INV. (Tk)			
Loan	19	6039	6809
Grant	15	3003	5569
Self-financed	6	9138	6942
Mean difference between Loan and Grant =	3036		
2-Tail Significance =	1.72		

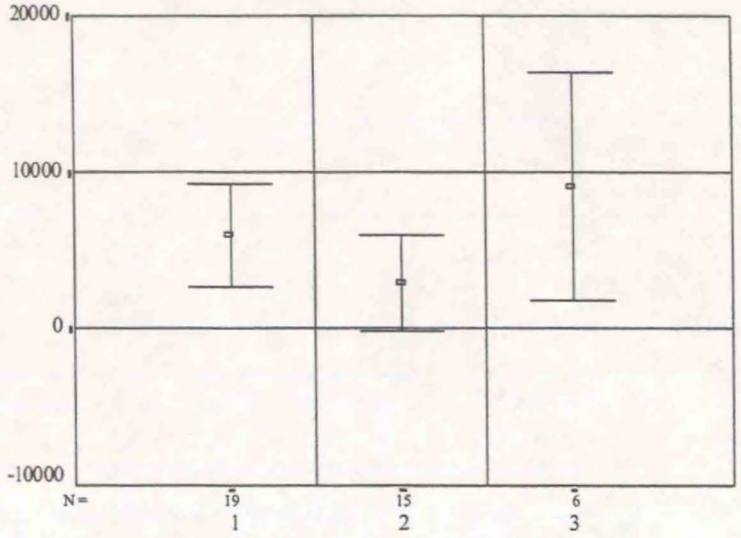
Nevertheless, there were exceptions, well illustrated by Shopon Mia's (HH 35) household, (see Section 4.4.2. on settlement programmes for the landless). It invested nearly 1.5 times the amount of grant provided by the agency; statistical tests indicate only the general trend within the sample and statistically significant results are hard to obtain when there is diversity within groups. It

should also be observed that households benefiting from institutional housing loans comprised a majority of the sample of loan households (12 out of 19), and these households were found to have a relatively high or stable income, and thus were able to invest substantial personal funds. This contributed to the results of the statistical test, shown in Table 4.9. On the other hand, the smaller proportion of households within the category of loan, utilising general loans from agencies or non-institutional loans, had much smaller incomes; for example, Alaya Khatun's (HH 7) household had a very low income and financed its house construction entirely with a small general institutional loan, and was unable to invest any personal funds.

Table 4.9. Mean household investment as percentage of house cost by financing type

Variable	No. of Cases (n)	Mean personal investment as % of house cost	SD
PCT.INV. (%)			
Loan	19	34.1	24.8
Grant	15	13.3	16.3
Self-financed	6	100	0
Mean difference between Loan and Grant =	20.8		
2-Tail Significance =	0.006		

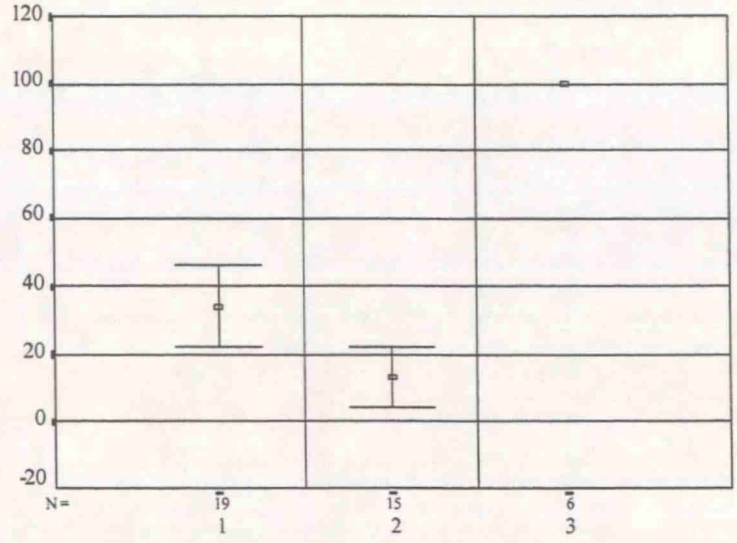
Chart 4.11. Mean household personal investment by financing type



Notes:

1. Confidence interval = 95%
2. Category (X) axis: Financing type
   1 = Loan, No. of cases (N1) = 19
   2 = Grant, No. of cases (N2) = 15
   3 = Self, No. of cases (N3) = 6
3. Value (Y) axis: Household personal investment (Tk)

Chart 4.12. Mean household investment as percentage of house cost by financing type



Notes:

1. Confidence interval = 95%
2. Category (X) axis: Financing type
   1 = Loan, No. of cases (N1) = 19
   2 = Grant, No. of cases (N2) = 15
   3 = Self, No. of cases (N3) = 6
3. Value (Y) axis: Household investment as % of house cost

Charts 4.11. and 4.12. express graphically the results of the tests outlined above. It should be noted that self-financed houses (fintype 3) were built entirely by personal investment by the household; they are not really relevant to the comparative analysis of the other two financing types. The different nature of personal investments by this group is clearly expressed in both tables and charts: in Table 4.8. and Chart 4.11. with a comparatively higher mean and wider spread, and in Table 4.9. and Chart 4.12. as 100% of house cost.

4.7. SUMMARY AND CONCLUSIONS

In this chapter answers to the following question, stated at the outset, have been attempted:

> **How far does the mechanism of providing or acquiring funds for house construction and maintenance by low-income rural households meet expectations and needs of the stakeholders?**

This has been answered according to the variety of financing type and a number of factors that interact within these types. In this section, findings relating to this question and conclusions regarding financing of housing are discussed. The bearing of this chapter on other chapters and aspects of this research are also considered.

4.7.1. Summary of findings

In responding to the above question, and according to the findings discussed in this chapter, the following answers were reached:

- Institutional housing loans, exemplified by the Grameen Bank rural housing programme, initiated as an attempt to provide access to funds for house construction to low-income households, have not on the whole been able to reach very poor households. Further, very little evidence was found of the effectiveness or indeed any widespread implementation of the strategy of improving a household's economic condition by institutional provision of income-generating loans as a pre-condition for affordability of larger housing loans. Housing loans tend mainly to benefit 'lower-middle class' households.

- Despite the lack of a co-ordinated institutional policy of this kind or indeed in the face of regulations against it, households had availed themselves of small general loans intended for income-generating enterprises from agencies, and had utilised them for house construction or repair. Although households paid higher interest on these loans than on larger but 'softer' housing loans, the smallness of the general loans appears to make them affordable to low-income households.

- Rural households tend to seek loans from a variety of non-institutional sources such as relatives, friends or village moneylenders. There is considerable diversity within this traditional mode of obtaining access to funds; the preferred source is wealthy relatives forwarding loans on lenient terms in comparison to village moneylenders who usually charge high or extortionate interest and lend on stricter conditions.

- Most examples of provision of housing through grants by agencies are related to post-disaster rehabilitation. Many agencies experience an influx of international funds after a natural disaster and utilise these funds to provide grant housing. Although such an approach has the potential to alleviate sufferings of very poor and vulnerable households in these circumstances, it has been found that reaching the appropriate target group presents formidable difficulties.

- Sudden provision of substantial welfare, often done after natural disasters, was found to have a variety of disruptive effects on communities. A typical example is the expectation by villagers of continual welfare, making it difficult for agencies to introduce self-reliant or cost-recovery models of development in a context with a history of extensive post-disaster relief.

- The government has an extensive programme of granting land and housing to households categorised as 'landless' according to ownership of less than 0.5 acres of agricultural land. Although this programme has benefited very poor households, there is a general tendency by less disadvantaged households to pre-empt the programme. Households with considerable income from non-agricultural sources have been able to benefit from this programme by virtue of lack of agricultural land ownership.

- Whether the government housing/land grant programme is economically sustainable when a major part of its funding is obtained from external sources is an important question. An initiative to promote credit programmes to partially recover project costs has been planned, but it appears that the government lacks a co-ordinated long-term policy.

- A major proportion of the rural population fund construction and maintenance of their houses from personal sources. Usually these are households that can command the resources to make this mode of funding feasible. However, there are often households without access to funds who are forced to sell personal assets to finance house construction or compelled to construct shelters of only the most rudimentary and flimsy nature.

Three main quantitative variables have been found important in understanding financing mechanisms:

1. Cost of house: The total cost of a house has been calculated as the sum of institutional input (if any) in the form of a loan or the cost of a grant house, plus additional investment in the house during and after construction from personal funds. It was found that the higher the income of a household, the more expensive the house tends to be.

2. Household income: The income of a household is an important indicator of the affordability to households of adequate housing and the effectiveness of targeting by agencies. Its relationship to house cost has been established. In addition, it has been found that the higher the income of a household, the greater its ability to invest personal funds in house construction.

3. Personal investment: As mentioned, this is an important element in understanding household affordability. It does not appear to be significantly related to house cost, but is certainly an outcome of a household's income.

These variables when compared across the two main financing types - loan and grant - yielded the following results:

- The overall cost of houses in both financing types was found similar. As personal investment comprises part of the house cost in both loan and grant houses, this is understood to indicate that grant housing, like loan housing, has generally benefited households with moderate and stable incomes.

- Comparable incomes of households that had taken a loan and those that had received a grant is another indication that both these types of finance have been unable to reach very poor households. This assertion is made on the basis of findings showing the ability of loan households to make substantial personal investment in house construction, an indicator of their

stable or relatively high income. Because grant households have been found to have comparable incomes to these loan households, their economic profile can be considered equivalent.

- On the whole, loan households had invested a larger proportion of personal funds in house construction than grant households. This is not necessarily indicative of higher incomes, especially since incomes in both groups have been found comparable. Rather, it is indicative of the fact that grant housing is generally built to a quality such that it is not necessary to add to it to the extent necessary with loan financed housing.

4.7.2. Conclusions

Although a major part of this chapter attempted to demonstrate the inability of institutional housing programmes to reach very poor households, it must be acknowledged that the rise of the NGO sector has contributed to the improvement of rural housing conditions, albeit so far to a limited extent. The question is how to enable the efforts of this sector as well as the government's to reach a wider target group: households that are in abject poverty. In spite of well-meaning intentions, often this target has proved elusive. Even though this chapter demonstrates that households having moderate or stable incomes are generally able to benefit from institutional programmes, such households are often only marginally better-off than very poor households, but in the general context of widespread poverty, even such a small margin matters. Hence the attempt to differentiate it.

On the part of agencies, a broader range of ideas need to be embraced in order to achieve an appropriate financing policy mix and greater flexibility in responding to diverse households' requirements. Single financing models run by individual agencies will continue to cater only to specific groups, undermining the usual institutional objective and imperative of wider outreach. There is some change apparent, such as the move towards credit programmes by agencies that had previously provided only grants. Although this might prove fruitful, it has not yet manifested itself in the realm of housing, and appears to be limited to finance for income generation. Efforts at achieving policy mix have so far been minimal; a richer mix of programme types, financing models and a consideration of a greater variety of factors are lacking.

In this chapter a number of examples of poor households is cited in a variety of contexts: households unable to repay loans and thereby compelled to default, households adopting alternative strategies in utilising institutional resources, vulnerable households rehabilitated by agency programmes and households selling assets under the exigency of building houses. Such poor households are the principal concern of this research and the variety of actions they display in acquiring finance for housing could be a basis and model for institutional intervention.

There are social networks - loans from relatives, support derived from household members such as sons supporting elderly parents and large extended family structures - easing the burdens of

individual households. Although such networks do not exist in idyllic form and are often fraught with difficulties, and are also constantly eroded and re-shaped, they do offer agencies the opportunity to understand how households gain support from a variety of resources. Tapping into the resources of these networks might possibly enhance the efforts of agencies.

4.7.3. The broader context

Although this chapter deals mainly with the variety of financing mechanisms for house construction, these mechanisms do not operate in isolation. Certain types of finance are linked to particular ways of implementing and managing construction, and also relate to specific types of building design, construction technology and site planning. Implementation is discussed in Chapter 5 and housing design in Chapter 6, while Chapter 7 deals with the relationships between all three main aspects of the housing process. In practice, agencies and households do not view these aspects of housing separately, but for the sake of understanding and analysis, these aspects are dealt with separately and in detail in this study. Notwithstanding the need for this sectional approach, a later attempt has been made to obviate its shortcomings by providing interlinkages between the different sections of this research when drawing the main conclusions in Chapter 7.

It should also be mentioned that the Grameen Bank (GB) system of finance has been replicated in many other countries. Although these have so far been limited mostly to general credit for self-employment and income generation, it is not known if households in other developing countries also utilise such credit for housing. It is foreseeable that the GB housing loan model might begin to be replicated, if it has not been already. Thus this study of financing in the context of Bangladesh may offer policy lessons of wider relevance, thereby contributing to the evolving paradigm of 'South-South' exchange.

• *CHAPTER 5*

IMPLEMENTATION

5.1. INTRODUCTION

In Chapter 4 the different mechanisms by which rural households acquire funds for house construction were discussed. It is important to understand how these funds are deployed in implementing house construction. In this chapter, different methods of implementation are discussed and analysed in order to provide answers to the second derived question:

> **To what extent does the process of implementation of housing of low-income households in rural areas facilitate effective production and management of the housing?**

Information on implementation was gathered from a variety of rural low-income households in different geographical regions of Bangladesh. Essentially there were two types of household: those that had benefited from institutional support and those that had not. This classification does not necessarily coincide with the broad categories of institutional and non-institutional financing discussed in Chapter 4, although there might be overlaps. For example, a household may have taken a housing loan from an agency, but executed house construction on its own. It has therefore been necessary to analyse implementation independently, and where appropriate, to show links with other important aspects of the housing process.

During collection of information in the field, it was often necessary to disassociate the factual from the experiential. For example, to gather information on the supply and costs of materials, labour and the physical process of construction, agency staff had to be approached; beneficiaries were sometimes not involved in, and hence unaware of, these practical aspects of implementation. However, the experience of being provided with houses through agencies could best be related by the beneficiaries (although agency staff also usually had opinions, thus triangulating the information obtained). Collection from these two discrete sources allowed subsequent merging before analysis of salient aspects of implementation.

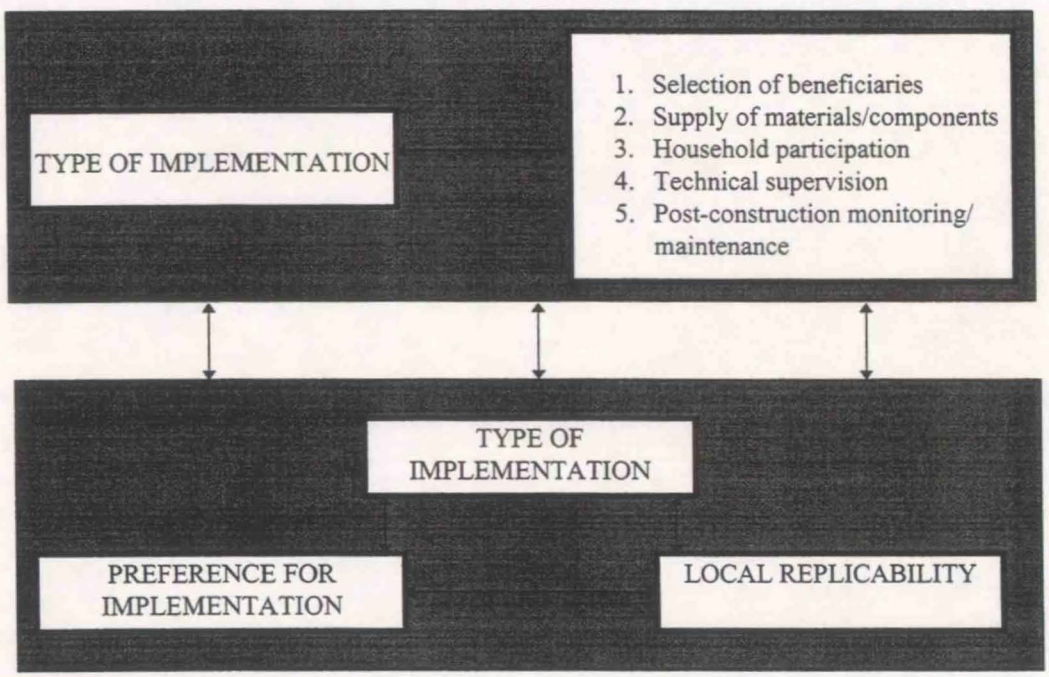
In institutional housing, selection of beneficiaries is an important constituent of the preliminary stage of implementation. In the case of non-institutional housing it is important in a different sense. With the extensive expansion of NGOs, most rural households are exposed to their activities even if they do not participate in or benefit from NGO programmes. In a context of severe constraints on a majority of the rural population in securing adequate housing, provision of housing by agencies to a selective and limited number of households is bound to impact upon the community as a whole. Knowledge about the reasons for selection or rejection, and how these actions affect households, enables a broad understanding of implementation of certain types of housing. Additionally, it is important to understand why certain households do not opt for

institutional housing in spite of its local availability and easy access. For these reasons, twelve geographically dispersed housing programmes were investigated in the field, and in each location, where possible, households that had not benefited from agencies but resided in proximity to agency-supported housing were also studied.

The much discussed and debated concept of community or household participation is investigated in this chapter. Differing degrees and types of participation by households during implementation of agency-built housing, as well as varying levels of the relationship of households with agencies in self-built housing, are analysed in order to develop an understanding of the concept of 'participation' in practice.

Post-construction follow-up has also been found related to implementation. Instead of its being an one-off exercise in executing construction, a long-term view of implementation includes post-construction support. Capacity of households for maintenance of houses has often been found linked to method of implementation. This is discussed in this chapter.

Fig. 5.1. Basic analytical framework (implementation)



As in Chapter 4, two types of analysis are conducted here: a qualitative discussion and comparison of different types of implementation, and quantitative tests to augment this discussion and comparison (see Fig. 5.1.). Five main topics relating to implementation serve as a basis for the qualitative discussion: beneficiary selection, supply of building materials and components, participation, technical supervision and post-construction monitoring and maintenance. Although not always evident from section sub-headings, these topics assist in identifying important themes and their relationships. Appendix A.4. shows the qualitative analytical method adopted and the role of these topics. The quantitative tests compare the main types of implementation according to two aspects - preference of households for implementation method and local replicability of

projects - and explore relationships between these aspects. Finally, this chapter makes linkages with previous chapters and points out the relevance of findings discussed here to later chapters and the study as a whole.

5.2. TYPE OF IMPLEMENTATION

Of the forty households studied in the field, eleven had not benefited from direct agency support. However, this does not imply that agencies had implemented house construction for all the supported households. For example, a household may have received financial support from an agency by obtaining a loan and but built the house on its own. This is reflected in the categorisation of implementation types in Table 5.1. There are two main methods of implementation - agency-built and self-built - with sub-types within each category. A frequency count of households in each category is shown in Table 5.2.; the almost equal frequency of households in each category is conducive to comparative quantitative analysis. The numbering for households (HH) has been followed consistently throughout the text and this sequence and basic information on each household, is shown in Appendix A.2., Table A.2.1.

Table 5.1. Categories of implementation methods

TYPE	SUB-TYPE	HH NO.	NO. OF HH	%
Agency-built	Completely agency-built	11, 12, 27, 34, 35, 37	6	15
	Household partly involved	6, 13, 14, 20, 21, 22, 23, 24, 26, 29, 30, 32, 33, 39, 40	15	37.5
Self-built	Completely self-built	3, 4, 5, 7, 10, 15, 19, 25, 28, 31, 36, 38	12	30
	Partly self-built (some components supplied)	1, 2, 8, 9, 18	5	12.5
	Agency support to entrepreneur	16, 17	2	5
		TOTAL	**40**	**100**

Table 5.2. Frequencies of main empirical implementation types

TYPE OF IMPLEMENTATION	NUMBER OF CASES	PERCENTAGE
Agency-built	21	52.5
Self-built	19	47.5
TOTAL (N)	**40**	**100**

5.3. AGENCY-BUILT: SYSTEM OF PATRONAGE

This method of implementation mainly involves contractors or specialised builders employed by NGOs or the government. Contractors are without exception employed by agencies to build housing for low-income communities and almost never employed by low-income rural households

themselves; sometimes much wealthier households than those comprising the sample of this research use contractors, usually for *pucca* houses. For small individual houses, it is uneconomic and also impractical for low-income households to employ the services of a contractor. It is done, however, when several houses are built at or about the same time by an agency, when the perceived economy of scale makes such a mode appear feasible to agencies. It involves advertising for tender bids, but often contractors are selected on the basis of personal connections. Projects for the construction of a certain number of housing units, accompanied by site preparation, are given out to contractors who complete the projects on a turnkey basis. It is the responsibility of the contractor to appoint necessary sub-contractors and construction workers in such projects.

Even though a large amount of responsibility is allocated to the contractor, agencies also play a significant role. The design of houses and site-planning is primarily prepared by the agency and it is the contractor's duty to execute them. Choice of building materials, sources of supply and sometimes modes of transport are specified by the agency. During construction, some agencies provide technical and field-level supervision, often due to concern about controlling quality of construction and avoiding unethical undertakings by the contractor. Inspection upon project completion and post project follow-up are also often carried out by agencies.

This is a general pattern and there are variations within it, according to the degree of involvement of housing beneficiaries or the community, and dependent on the particular implementational policy of agencies, discussed below. There are also variations, less formal than the typical contractor-built mode described above. For instance, experienced carpenters or masons (known as *raj-mistris*) often serve as small-scale contractors in rural areas. They are usually not appointed through tenders or on a formal basis; agencies working on small scale projects in a particular rural location seek the services of local *raj-mistris*, often for the sake of convenience. *Raj-mistris* usually have their own team of workers. An example is the project by the NGO Employment and Technology Development Agency (ETDA).

Table 5.3. Some typical methods adopted by different implementors

Implementor	Executor	Type of work
Agencies	Contractors	Several houses; usually large-scale projects; using some manufactured materials.
Agencies; wealthy rural households	*Raj-mistris*	Individual or few houses; usually small-scale projects; using some manufactured materials.
Low-income households	*Kamlas*, household members	Individual houses; individual household scale; using mostly natural materials.

There are two types of construction workers, graded according to their level of skills: *mistris* and *kamlas*. *Mistris* are carpenters or specialised building craftspersons, mainly employed for construction with CI sheet and timber framing or other manufactured materials. *Kamlas* are menial workers who comprise the *mistri's* building team. For houses made of earth, bamboo, thatch or organic materials, *mistris* are not employed; households employ *kamlas* for construction according

to their requirements and under supervision of their members. Housing not built by contractors is discussed in Section 5.4. on self-built housing.

5.3.1. Completely agency-built

Unlike some NGOs which promote self-help housing, government-supported low-income housing projects are most often built by contractors. Such projects involve NGOs in a variety of partnerships with the government. Most typically, as in the extensive Adarsha Gram (AG) programme of the government (see Box 4.4. in Chapter 4), NGOs are involved in post-project community development and do not play a role during project implementation. However, earlier examples of AG projects involved NGOs as implementors, especially when an NGO could obtain and invest substantial international funds. Such an example is provided by the projects of World Vision of Bangladesh (WVB) in collaboration with the government, discussed below.

The other typical mode, relatively recent and generally initiated from the 1980s, involves collaboration between the Local Government Engineering Department (LGED) and small NGOs. This is possibly a result of the ideology that emerged at that time among international development agencies: promotion of grassroots organisations and channelling funding for development to the NGO sector (see for example ActionAid 1988, p. 3), accompanied by increasing pressure on the government to involve NGOs in its activities. For instance, large multilateral organisations such as the United Nations Development Programme (UNDP) began to provide funding to the government for housing projects on condition of its involving small NGOs in implementation. Examples of this are the LGED-ETDA (HHs 26 and 27) and LGED-JBP (HHs 13 and 14) projects.

In this way, many NGOs began co-operating with the government and were used almost as public sector sub-contractors. This was primarily on pragmatic grounds: NGOs with their grassroots linkages are often in a better position to deliver development assistance than governmental bodies. However, this often compromises the position of NGOs as autonomous actors with an independent agenda and developmental ethos. Understandably, in the context of Bangladesh, instead of resisting this trend most NGOs welcome the infusion of international funds and support; indeed, it can be argued that this trend is accompanied by an increasing proliferation of NGOs.

5.3.1.1. Corruption: beneficiary as victim

Efforts to forge a partnership between the government and NGOs are not without antagonisms. For example, according to an AG staff, NGO staff operating credit programmes in some of the AG settlements allegedly pilfered programme funds. On the other hand, according to a WVB staff member, during implementation of an AG settlement project in Chittagong (to which HHs 34 and 35 belong), the government spent far too much time levelling hills on site in preparation for housing built by WVB (see Box 5.2.), thereby causing undue delay and impeding progress. These examples illustrate the often uneasy relationship between the two partners, providing the opportunity for each to blame the other for failures or problems encountered in collaborative

projects. Involving a building contractor in such projects means involving a third party (or partner, if that can be considered an appropriate term), creating further scope for shifting blame and spreading mistrust. It also provides opportunities for corruption; in several of the projects studied, beneficiaries reported corruption by contractors. According to Shudipto Chandra Ray (HH 11), a beneficiary of an AG settlement in Dinajpur district:

> There was too much corruption during construction in this project. For example, prices quoted by the contractor for locally bought bamboo were much too high. We know the local price, and we were shocked when we heard that he had bought bamboo at such high prices! It couldn't be true! He must have made thousands of Takas in this way.

It is typical to blame the contractor for corruption. As a WVB staff member commented, 'There was too much system loss [sic] in the projects due to corruption of contractors'. However, it is too easy to blame the contractor, who does not generally belong to an officially recognised formal institution and is often untraceable after project completion, and hence unaccountable. Field studies show that members of the different implementing bodies collude in enabling corruption; it is not only the contractor who is responsible. Possibly without such collusion it might be difficult, if not impossible, for the contractor to indulge in corruption. As related by beneficiaries of the AG settlement in Chittagong:

Vignette 5.1. The angry chairman

During the initial period of implementation of an AG project in Dinajpur, the Union Council chairman paid a visit to the site. Upon inspecting some of the RC posts that had recently been fabricated he realised that they were of extremely poor quality. There was too much sand in the cement mix, and simply poking them with a stick made their surfaces flake off. Seeing this, the chairman became terribly angry. He took a metal rod and began hitting and breaking a RC post, cursing the contractor for being corrupt and for the poor workmanship. The villagers present were stupefied by this sight.

After this incident, work on the project was suspended for about a month. The chairman complained to the District Commissioner's office. Although in this project the chairman had very little control, the poor quality of the contractor's work incensed him and made him seek action through whatever connections he had.

As a result, the RC posts made subsequently were of better quality; the contractor was afraid of reprisal. However, towards the end of the project, when sanitary toilets were made, the contractor had his way again. Within a short period of use, the toilets began falling apart and the contractor who was not from the area could not be traced. Perhaps not only an angry chairman, but also a more vigilant one was required to keep the cunning contractor in check.

> A lot of money in this project was lost because of corruption by the contractor. Also, the WVB project manager was corrupt and schemed together with the contractor and government officials to steal funds and give us poor quality houses. They reduced the size of houses we were supposed to get and sold off the extra CI sheets. Everybody involved made their bit in this project.

Jannatara Islam (HH 34), a beneficiary of the project added:

> The contractor didn't even complete the houses, because he had siphoned off all the funds before finishing the project. When I moved in, I had to lash the lower parts of the bamboo mat walls, they were all left unfastened and were flapping in the wind.

In most of these projects, especially in the AG programme, technical supervision is supposedly carried out by government engineers or technical staff appointed by the agency. Their chief purpose is to control quality of construction and corruption by the contractor, such as adulteration or use of inferior materials, mainly in projects where RC is used and there is scope for weakening the cement mix, or reducing reinforcing rods. However, according to beneficiaries' reports, in the AG settlement where Shudipto (HH 11) lived, even though there was a site engineer, he could not prevent corruption. Although the RC posts in this project were reportedly of good quality, the sanitary toilet slabs and rings were poorly made, and began cracking and crumbling shortly after project completion. In another AG settlement in the same district it was reported that the local TNO (*Thana Nirbahi* Officer - a local administrative bureaucrat) was like a dictator and completely overruled the engineer even in technical matters. Thus it appears that the engineer's presence is often simply a token gesture towards technical professionalism. His role is strictly restricted by other more dominant actors; indeed, he may often take part in the scheme of collusion in corruption. In some projects, especially where there is no RC work, personnel with such limited professional responsibility are not employed. According to a WVB staff, 'In our projects we didn't need an engineer. The technology used was simple enough for our staff to supervise.'

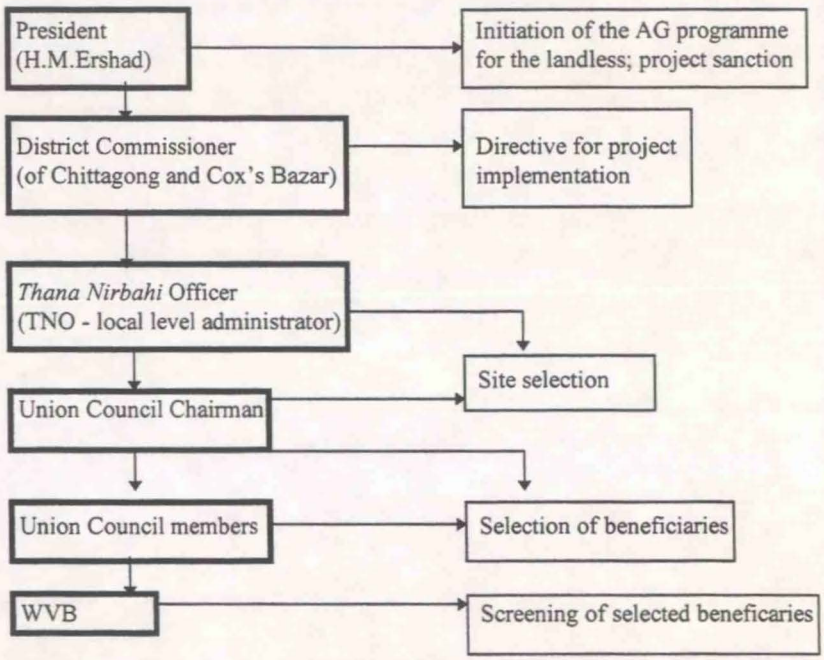
Where there is lack of accountability by various parties involved, and a portion of international and public funds allocated for projects benefit individuals for whom it was not intended, beneficiaries are deprived of a better quality of housing than they eventually receive. It is the socially and economically weak who become victims of corruption; even though some of them were aware of the insidious nature of actions during project implementation in the WVB project, they were not in a position to protest or demand honesty. As it was a grant housing project, beneficiaries were passive, in order to receive free houses and homestead land without jeopardising this opportunity by instigating conflict.

Corruption is also evident in the selection of beneficiaries. The smallest elected administrative unit in Bangladesh is the Union Council, consisting of members who, in the case of the AG-WVB projects, prepare lists of prospective beneficiaries, under the directive of its chairman. These members generally belong to local communities (though usually not of very low-income backgrounds); they are thus considered in a position to make accurate needs-assessment and selection. However, their position also entails demands on them to confer favours and to grant 'requests' to locally influential and politically connected individuals.

When WVB received the list in Chittagong prepared by Union Council members, it was found to contain many households that owned homestead land and had houses, whereas the project was intended for a landless and destitute target group. In extended discussions with the project beneficiaries, without presenting them with a leading question, some conceded that in addition to corruption on different levels, there was corruption in selection by the Union Council members: 'The members also had their own scheme.' According to a WVB staff member, the list had to be rectified by WVB, which caused a great deal of resentment and conflict. The Union Council

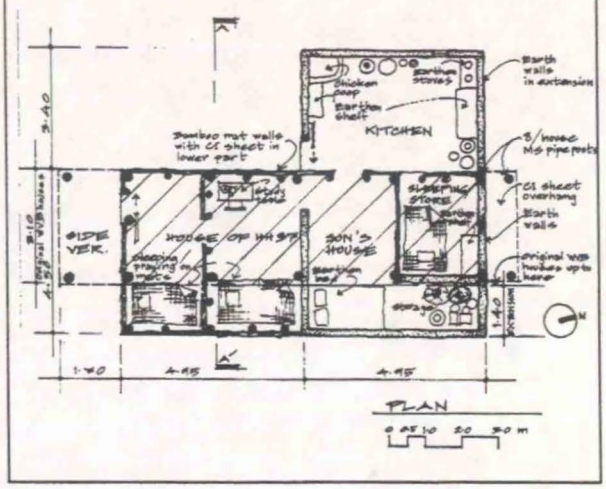
chairman and members were very unhappy with this stance taken by WVB and felt that an outside NGO was encroaching upon their territorial privileges. Observation of some of the beneficiaries' economic position made it doubtful whether the screening claimed to have been carried out by WVB was successful. As discussed in Chapter 4, Section 4.4.2., several beneficiaries of the project did not appear eligible according to the criteria of the project, or met the criteria only partially.

Box 5.1. Organogram of selection process in the AG-WVB projects



In the AG-WVB project in Cox's Bazar, there were also serious problems of corruption. For example, it was found that a father and son received adjacent houses by claiming to be separate households, when in reality they belonged to a joint household (HH 37). In this project, households affected by loss of their land by erosion and the 1991 cyclone in the offshore island of Kutubdia were resettled in a grant housing project in this new inland location. There were 565 affected households, of which only 80 were selected (about 14%). In such a stringent degree of selection, there is bound to be intense competition, creating scope for those in authority to indulge in unethical dealings. According to WVB staff, corruption in this project was so rampant that the contractor and Union Council members colluded and managed to reduce the site area from ten acres to two. Although WVB claims to have had no hand in these proceedings, the case of the corrupt WVB project manager in Chittagong, related by beneficiaries, casts doubt on these claims.

Fig. 5.2. Sajjad Ullah (HH 37) and his son's joint household received adjacent houses in the AG-WVB settlement on the pretext of being separate households



In a context where corruption is endemic and permeates most aspects of institutional operation, it is perhaps understandable that rural housing programmes cannot be an exception. Nevertheless, it is important to note that the multi-tiered institutional arrangement (Box 5.1.) adopted in the AG

programme creates opportunity for corruption at different levels of administration and implementation, and promotes a lack of accountability. A different model with fewer actors, and authority clearly invested in a small group, might yield different results, as in the ETDA-LGED collaboration. Here a small grassroots NGO (ETDA) was provided with responsibility for implementation, with a local governmental body (LGED) giving overall supervision and technical support. The executive director of ETDA had local roots and was instrumental in project implementation; he was very active in the field and undertook the major responsibility for the project. In addition, instead of employing a professional contractor on a formal basis, a *raj-mistri* was given the contract, ensuring greater control by ETDA. ETDA had been working in the area on community development programmes prior to the housing project, and beneficiaries were selected from existing members. Houses were provided to all the 315 members (with the exception of one member, considered unreliable), thereby minimising nepotism. There were, of course, problems of 'requests' from local influentials (*matbors*), accompanied by threats from hoodlums (*mastans*), to include households other than ETDA members; more than 2500 local households wanted houses. Nonetheless, ETDA did not succumb to the pressure and there was no report of corruption in this project.

It needs to be pointed out that institutional arrangements alone are not responsible for corruption or a lack of it. The personal integrity and honesty of individuals can contribute towards avoiding corruption; in the ETDA project, the executive director's personality was greatly responsible for honest implementation of the project. However, such a model does not always yield completely positive results. Houses were provided on credit in this project, and subsequent to completion, a large number of beneficiaries defaulted on repayment. Default is linked to a range of factors (see Chapter 4, Section 4.3.1.); a project, successful in implementation, may suffer from failures in other aspects if it does not have a strategy for overall effectiveness.

5.3.1.2. Construction: applying pre-conceived ideas

The typical construction process in contractor-built projects consists of transporting manufactured materials, cement, reinforcing rods, CI sheet, metal parts for components, etc by lorry from nearby towns or cities to rural sites. Such materials are generally not available in remote rural areas. These materials are then used for fabricating components such as RC posts, MS (mild steel) roof trusses and posts on or near to the construction sites. Natural materials such as bamboo are usually acquired locally. Once fabrication is complete, houses are rapidly erected within a week. Because of this, when households were asked if construction time was reasonable, they tended to agree that it was. However, this conceals the long periods required to negotiate between different parties, purchase, transport and fabricate the components; households were generally unaware of them, often due to their lack of involvement in the total implementation process. For example, RC posts fabricated on site require curing for three weeks at a stage when beneficiaries may not have been selected. In the AG-WVB project in Chittagong, it involved levelling the hilly site before construction could commence, and almost three months were required to build forty houses (see Box 5.2.).

Whether such a process is locally replicable deserves analysis. As many houses were constructed in the same location in these projects, transporting materials was feasible, especially when institutional funding was available for it. However, in general most rural households build houses on an individual basis, and to transport manufactured materials from urban centres is quite difficult and not viable for individual low-income households. As Shudipto Chandra Ray (HH 11), living in a remote area, said:

> Cement pillars [RC posts] can be made locally; there are people with skills for that here, but that can only be done if materials are made available. We can't get cement and rods here.

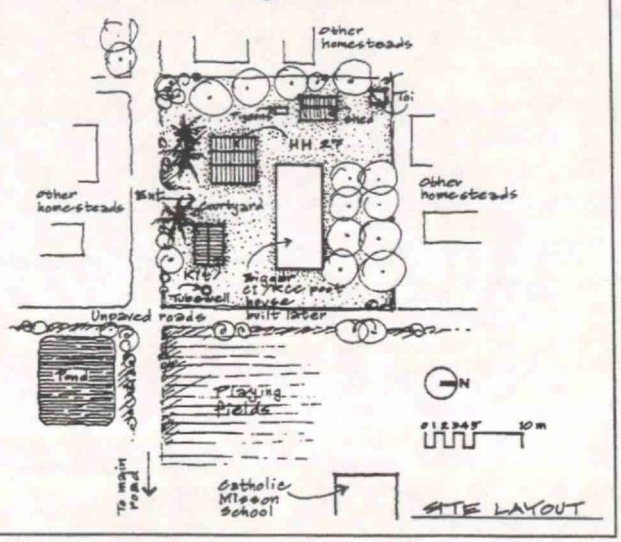
Box 5.2. Area profile of the AG-WVB project in Chittagong

Before the AG-WVB settlement was built in Chittagong, the area was very desolate. Consisting of small sandhills, it was difficult to convert to agricultural use. In addition, because of its location near the Karnaphuli river estuary, it was the haunt of pirates, who took advantage of the desolation to carry out their dealings. Hence it was a dangerous place, to be avoided by the general public.

The area received identity after a chemical fertiliser factory was established there. Construction of a main thoroughfare road to service the factory resulted in the growth of small roadside shops, restaurants and other such informal commercial ventures, to cater to the factory workers and resident staff. Thereafter, the AG-WVB settlement of forty houses was built, and some of its residents could benefit from the employment opportunities at nearby small commercial enterprises and the factory. Other households migrated to this area and settled illegally on land surrounding the AG-WVB settlement, also to benefit from some of the new opportunities and the facilities (such as tubewells for water supply) of the settlement (see Vignette 4.6. in Chapter 4). The area was no longer desolate; its settlers had transformed it into a new village.

However, the village did not have its own name. It was known as the 'cluster-village' of the fertiliser factory because of its proximity to the factory. Facing this settlement of low-income households were the *pucca* residential quarters of the factory staff. The shiny brick buildings with their satellite 'dish' antennas and water towers stood in stark constrast to the small bamboo and CI sheet houses of the AG-WVB beneficiaries, huddled together across the street.

Fig. 5.3. Subsequent to receiving his ETDA house with RC posts, Ashim Gaine (HH 27) produced RC posts using local workers and built a large new house



Notwithstanding this limitation, it should be noted that sometimes introduction into rural areas of non-traditional products such as RC posts stimulates informal sector enterprise, which in response to local demand begins to replicate the technology. Shudipto's area was remote, but with the expansion of transport networks and better connections to urban areas, such components may very well become a locally replicable option eventually. This is illustrated by the widespread informal production and local use of RC posts in rural areas around Dhaka, initiated after their introduction by agencies since the 1980s. To provide an anecdote: during the author's field studies in 1997 in a rural area close to Dhaka, an NGO fieldworker related that when RC posts were originally introduced more than a

decade ago, many rural households were reluctant to use them as posts and he observed that they were used for other purposes - benches, sleepers for small bridges, etc. However, over time, with improved transportation and links with Dhaka, cement and rods became available and RC posts had begun to be produced extensively in that area by small-scale local entrepreneurs; now households that can afford them, prefer them to more traditional options. Ashim Gaine (HH 27), a beneficiary of the ETDA project where RC posts were used, subsequently fabricated RC posts on his own for a new building on his homestead, at less cost than those supplied by ETDA.

In spite of the widespread dissemination of RC posts in many rural areas, metal components, including posts and roof trusses, have not become popular since their use by WVB in its projects. There are several reasons for this. Firstly, fabricating metal components requires more specialised equipment than RC posts. As Shopon Mia (HH 35), a beneficiary of the WVB project in Chittagong said, 'We could make these metal components if we had a factory with electricity.' Secondly, many rural construction workers have skills in working with RC because of experience in *pucca* construction, increasingly common in most urban centres, which draw on a pool of rural migrant workers. Working with metal is more specialised, limiting its use. Thirdly, metal posts do not have the solidity, strength and durability of well-made RC posts, an important cause of their relative lack of popularity, not only among rural households, but also among most agencies carrying out housing programmes. Implementing projects that use metal components necessitates a contractor-built mode and it is not foreseeable that in the near future they could be spontaneously replicated and used by villagers.

5.3.1.3. Participation: rhetoric and reality

The above examples of applying non-traditional construction technology in contractor-built housing by agencies without assessing long-term acceptability and replicability prompts a basic question: can participation of beneficiaries in housing projects contribute to effective implementation? The term 'participation' has received tremendous attention since the late 1970s in development discourse, and a variety of analytical conceptualisations and operational definitions has been proposed in various quarters; its meaning differs among its various proponents. Some advocate it as a broad theoretical concept (often with practical applications), a means of changing structural conditions within society which prevent self-actualisation and overcoming poverty by under-privileged individuals and communities (for example, see Chambers 1997; Rahman 1993). More narrowly defined, it means simply the involvement of beneficiaries in development projects (see Fuglesang and Chandler 1993; Oakley *et al* 1991), although there are significant overlaps between these approaches. Hamdi has written about the various manifestations of participation in practice:

> The best processes of community participation ensure that everyone involved has a stake in the outcome and that therefore they have some measure of control over it. The best processes ensure that all concerned will share the responsibilities, profits, and risks of what they will decide to do. ... The worst processes are tokenism. These are plans devised by a dominant group legislated to seek the opinion of others, who consult these others on issues

that are preselected and may have little or no relevance to those invited to comment. In between, where most projects fall, are various shades of community participation...

(Hamdi 1991, p. 75)

Box 5.3. An example of the poor application of the concept of participation
(Excerpted from Chambers 1997, p. 90)

In India, new villages were planned after the Maharashtra earthquake of 1993. The planners wanted a grid layout for the new villages. Given a choice between a grid and cluster layout, people opted for the grid. The planners said that the decision was participatory.

Eventually it emerged that several factors had combined to induce choice of the grid layout: the planners had loaded their description in favour of the grid; older people did not fully understand the choice; young men said that the grid was modern, and ridiculed the older people for their doubts; the grid was known to be what the outsiders wanted to provide; and people believed they would get housing quicker if they agreed to the grid, since some other villages had already been constructed on those lines.

The displaced people, concerned with self-esteem, not fully understanding and feeling unable to change things, had acquiesced and said they wanted what they thought they were wanted to want and would be able to get. It seems that the planners had ventriloquised.

These manifestations occur because of the wholesale acceptance of the term 'participation' in development circles; its exclusion would amount to anathema in current development discourse. There are bound to be differing interpretations and varying levels of performance in application when there is such a widespead endorsement of the term. Without considering the implications of participation in practice, it has become conventional for most development project documents to contain references to it. How it is practised, or whether it is practised at all, appears a different matter. For example, even in the contractor-built projects with standard centralised design decisions of the AG, where there is no participation by beneficiaries in project implementation, there are references to participation in the AG annual report: '... the Adarsha Gram Project now includes components such as land use planning, people's participation ...'. One of the project objectives was: 'Assisting and involving Adarsha Gram communities and families in the establishment of homesteads ...'. (Bangladesh Ministry of Land 1995, Foreword and p. 3). As observed by Hye: 'The financing memorandum and the [AG] project proforma stipulate that the construction of houses has to be done by the settlers themselves. But, in fact, this has been done by contractors' (Hye 1996, p. 92).

If the AG programme is compared to the example in Box 5.3., it can be seen that in the latter there was at least an attempt at participation, albeit with poor results, whereas in the former there was only a token reference to it. What is common though is that people in a context of poverty and difficult living conditions generally tend to agree with how a commodity, such as housing, is provided by an agency. Even when a beneficiary articulates the importance of participation, it is sometimes framed with reference to its benefit to the agency, not to the beneficiary: 'If we were allowed to build our own houses, there would be no risk of blaming the government', said Rohima Khatun (HH 12), an AG beneficiary. A prominent AG staff member believed that it was better to involve beneficiaries in project implementation because this led to more beneficiary satisfaction with the houses provided. However, in reality there was usually only one pre-implementation

meeting with beneficiaries, which the same staff member thought made the projects sufficiently participatory.

In the AG projects, even those implemented by WVB, there was generally no consultation with beneficiaries about house designs, site selection and planning, and no involvement during construction. Most beneficiaries had no idea of house cost, construction process, source of labour and materials, etc. When asked about participation, Shudipto Chandra Ray (HH 11) simply said, 'They didn't let us, so we didn't'. Some beneficiaries move in a long time after project completion. Sajjad Ullah's (HH 37) household was allocated a house in an AG-WVB settlement in Cox's Bazar in 1989. However, the household did not move into the house until two years later, after a cyclone devastated their homestead on an offshore island where they lived previously. Sometimes beneficiaries are selected even without applying; Jannatara Islam (HH 34) was chosen by agency fieldworkers. As succinctly articulated by a WVB staff member: 'The MS angles was my idea; an engineering firm in Dhaka designed the house; meetings were between WVB and the government; and the contractor and his team built the project.'

Fig. 5.4. Most households in the AG-WVB project in Chittagong had extended the fronts of their houses, using local earth

It is often possible that individuals and communities with local knowledge and skills can contribute these resources towards building housing more suited to their needs, and where there is the possibility of such efficiency, it may serve as a viable option for agencies. However, the 'participatory' concept is often based on an emotional grounding in liberal ethics and conscience regarding equity, acting as a grand narrative, thereby sometimes overruling pragmatic considerations. Hamdi (1991, pp. 83-86) has cautioned against such an approach and has provided examples where participation has produced negative results, and has suggested that it does not always offer significant advantages, especially in house design. Its potential for application, the type of participation and the level of involvement of the community can be best determined only according to the specific context and nature of the community. For example, in the AG-WVB projects mentioned above, according to a WVB staff member, there were a number of reasons for not involving beneficiaries in the construction process. It could have been time-consuming and difficult for WVB to mobilise sufficient and suitable local labour for projects of such a scale, problems over payment may have resulted, appointing a contractor allowed WVB to retain control since it was not necessary to deal directly with construction workers but only with the contractor who maintained control over his team. Had local workers been employed, it might have been difficult for the agency to take disciplinary action against them in cases of unacceptable practice and behaviour, because such workers often had local political connections; as in the contractor mode, corruption might also have occurred if local labour or beneficiaries were involved. It was important for households to

obtain secure land tenure, and after that was granted, they mostly managed to adapt the houses incrementally to their requirements, using local technology and skills, overcoming drawbacks in design. In this case, concern for participation in house design appears somewhat marginal. In the AG-WVB settlement in Chittagong, of forty houses, thirty-eight had been substantially modified and extended using locally available earth from the surrounding hills; the original WVB houses were barely visible.

Nevertheless, there might have been scope for more involvement by beneficiaries which may have had better results, but a pre-requisite for that would be a different kind of agency and a different relationship to the community. The AG settlements often consist of households selected from different places, and in that sense, they comprise communities of strangers. Varying interests, backgrounds and aspirations make it difficult for them to function initially as a unified community, though over time these drawbacks to a large extent disappear. There is thus scope for building communities, parallel to settlement planning and house design, where the entire integrated process allows positive participation. For example, in some of the LGED-ETDA projects, ETDA had been working with the community for some time before the housing projects were initiated. It was then possible to employ beneficiaries in their own house construction and to discuss and receive input from them about house design.

Problems often do arise, especially for the new inhabitants, when housing sites are selected without community participation. All AG settlements are established on sites chosen by the government. Usually, available public (*khaas*) land is utilised for this purpose, and thus it is often difficult always to provide favourable sites; often sites with only low demand and poor locations can be provided. When Sajjad Ullah's (HH 37) community was resettled in an AG-WVB settlement in an inland location in the hills of Cox's Bazar, it faced serious conflicts with the neighbouring local community. During implementation, WVB had to resort to police protection to prevent the locals from obstructing construction work. Subsequently, a separate mosque had to be built for the project beneficiaries as the local community did not allow them to pray in its mosque. During the author's field studies, antagonisms between the two communities were still evident, eight years after project completion. Many of the beneficiaries were fishermen on the offshore island where they had lived previously and some of them continued to travel to familiar fishing areas there, leaving their families behind for extended periods; their vocation entailed travelling long distances from this inland location where they had few employment opportunities.

The location of Shudipto Chandra Ray's (HH 11) settlement was quite remote, with minimal transport links. There were hardly any employment opportunities in the area; beneficiaries had been promised agricultural land nearby, but that promise was not fulfilled. The main connection to the nearest rural centre at a distance of nearly 10 kms was mainly by a pedestrian path over an embankment. Three years after the settlement was established, the embankment was breached, flooding the site (such breaching is common in many parts of Bangladesh). In the monsoon season, connections to the outside world became severed, except by country boats, which many residents could ill-afford. Out of 150 households, more than 100 had abandoned the site, especially those with houses near the embankment and facing severe flooding.

Box 5.4. 'The cluster village in Natore now barren land'
(Excerpted from the Daily Star, Bangladesh, 29 March 1995)

The cluster village [former name of AG settlements] established at Diar Radhapur in Lalpur thana, Natore at a cost of Tk 10 million has now turned into a barren land.

Official sources said that the cluster village was set up for 202 distressed families during the fiscal year 1992-93, with a view to providing each family with one and a half acres of land and a two-room house. Mainly riverbank erosion-affected families were rehabilitated in the cluster village.

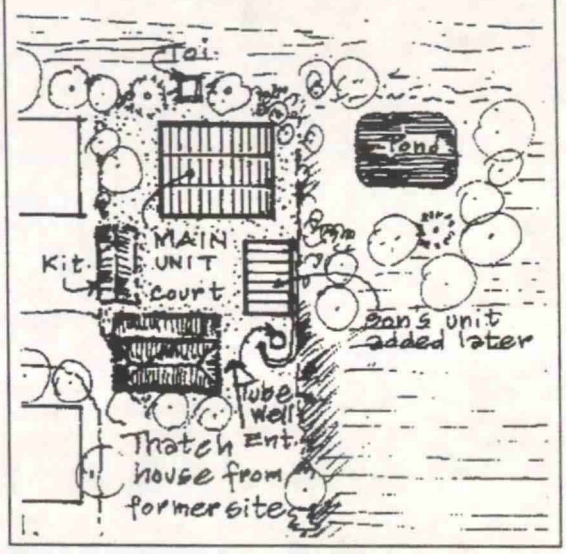
The inhabitants complained that the low-cost houses were built in such a fragile manner that many collapsed on their own and the rest were damaged by strong winds. It was learnt that members of the village have to travel long distances in search of work in its absence in this sandy area. When houseowners were away, miscreants created a reign of terror and looted their belongings.

As a result, the Tk 10 million cluster village, lacking proper maintenance and care by the authorities concerned, has been gradually abandoned by its inmates. Of the 14 tubewells, three were stolen and ten went out of order, the villagers said. Finding no security in their lives and no job opportunities, members of the cluster village migrated to other places to eke out their living.

The TNO and police said that they informed the authorities about this matter. But they did not say anything about the wastage of Tk 10 million public money in setting up the half-hearted cluster village.

Even without participation, a better site might produce more positive results. Another AG settlement in the same district, located near a market and with a good road connection, was an example of a flourishing community. Here beneficiaries were provided with some agricultural land, a mandate of the AG programme, but unfulfilled in other settlements. Trees had been planted, houses re-arranged by households to suit their needs and extensive additions had been built. Over time, Rohima Khatun's (HH 12) household in this settlement built a new unit and relocated their previous thatched house to this new homestead.

Fig. 5.5. Rohima Khatun's (HH 12) household progressively extended its homestead by adding new units



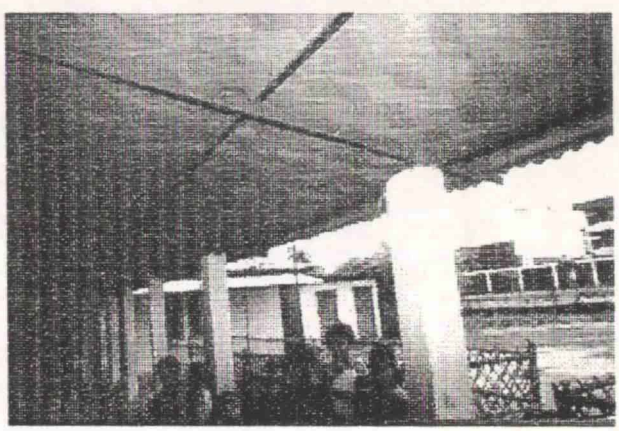
It is difficult to suggest, in the context of the above examples, and the tendency for corruption in contractor-built projects, how household or community participation can be embodied effectively in such projects with positive results. Without major structural changes in the nature of agencies and their relationships to low-income rural households, the notion of participation may remain simply rhetoric.

5.3.1.4. Post-construction issues: the disappearing act

In most of the completely agency-built projects, beneficiaries faced a number of problems after project completion. Almost all complained about the rapid deterioration of bamboo mat walls, and where timber had been used, termite attack. In the climate of Bangladesh these are common problems and hence these projects are no exceptions. However, because of agency intervention, a vertical patron-client relationship had developed, affecting the self-reliance of households and leading to expectation of continuity of assistance. This was articulated by an ETDA staff member: 'It should be possible for them to repair the walls on their own. They have started depending on us, but we don't have any provision for continuous assistance'. This overlooked the fact that most of the households did not have bamboo walls in their former houses; they could only afford less expensive organic materials such as reeds (*hogla*) or straw. Given their incomes, it was usually not possible to afford bamboo or timber to repair the houses provided, an additional reason to expect help from agencies.

Post-project follow-up varied widely across the projects. In the AG projects, as Shudipto Chandra Ray (HH 11) complained: 'The officials have all disappeared; we don't see them any more. They used to visit initially after the project had been completed, but not any more.' AG staff agreed that post-project follow-up was important and said they were planning provision for repair and maintenance. The involvement of NGOs in the AG projects for post-project community development appears to serve this purpose to some extent. This was evident in the AG-WVB projects, where WVB had a site office in the settlements. In Chittagong, after the allegedly corrupt project manager was replaced, the new manager attempted to overcome some of the deficiencies of the contractor's shoddy work. Extra CI sheet was provided to extend the houses which had been reduced in size by the corrupt contractor. After the 1991 cyclone, WVB assisted the community in rehabiliating damaged houses both in Chittagong and Cox's Bazar. In addition to such efforts, there was ongoing community development through health, schooling and credit programmes. It appeared that a high degree of rapport had been established between the community and the on-site WVB fieldworkers.

Fig. 5.6. The on-site WVB school in the AG-WVB project in Chittagong, part of WVB's community development programme



On the other hand, proponents of participatory development suggest that agencies should gradually withdraw from the community after assisting it, otherwise the community's initiative for self-reliance might become impaired. As stated by Rahman, 'the NGO should work so as to make itself progressively redundant to any group or set of groups with which it has been working intensively' (Rahman 1993, p. 73). However, there are practical problems in implementing such a policy. To provide an example: Before the AG settlement was built in Chittagong, the area was isolated. Subsequently, other landless households had settled illegally on public land surrounding the AG settlement. WVB had begun to extend some of its services to these households, believing that the AG community, having received sufficient assistance, should aspire to self-reliance; it was felt necessary to assist new households instead. However, this was a matter of grievance to the AG settlement households. They felt that resources meant for them were being diverted to outside households. The AG settlement community representative, Mohammed Ali (as well as several other beneficiaries), expressed deep dissatisfaction with this situation: 'They [WVB] don't care about us any more. They are more interested in outsiders.' Such grievances had begun to create conflict between the AG community, neighbouring non-AG households and WVB.

For an agency interested in operating according to the participatory dictum, such conflict is bound to arise if a paternalistic mode, such as providing contractor-built housing, is initially adopted, followed by expectation that the community would achieve self-reliance - an inherent contradiction in contractor-built grant housing. It may not be easy to incorporate the ideology of self-reliance within this model of operation.

5.3.2. Household partly involved

In contractor-built projects such as the AG programme, where sites are developed, houses built and then allocated, there is no involvement of beneficiary households in implementation. Indeed, often beneficiaries are selected after completion of construction. In projects where houses are built on sites owned by beneficiaries, there are varying levels of involvement. Many of these projects are part of post-disaster rehabilitation programmes, when new houses are provided to replace devastated ones. In the LGED-ETDA programme discussed in Section 5.3.1., houses were also built on beneficiaries' homestead sites, and according to ETDA staff members, beneficiaries were involved to some extent. However, in the project area visited during fieldwork, beneficiaries reported that they were not involved at all. It is possible that in other project locations there was involvement, such as in HH 26 discussed below, but as there was no evidence of that in the project studied, it has been included as an example of completely agency-built housing.

Yet the majority of households within the research sample of agency-built housing was partly involved (see Table 5.1.); in most projects studied, households were involved to some extent, ranging from simply assisting the contractor's team in menial tasks - carrying and lifting - to greater degrees of participation in design decision-making during construction. Although varying in degree or form, involvement usually took place within domains of labour or responsibility demarcated by a particular agency policy, and also sometimes by household initiative. For conciseness, these varying levels of involvement are not dealt with separately; variations are discussed where appropriate within the category of partial involvement of household.

5.3.2.1. Corruption: a multi-layered phenomenon

In some post-disaster rehabilitation projects, because houses are built on existing sites, beneficiary selection is sometimes less problematic than in the AG projects. Nonetheless, despite the involvement of beneficiaries, there is the possibility of corruption, not entirely dissimilar to that in completely agency-built projects. After the 1989 tornado in Saturia district, the NGO Enfants du Monde (EDM) provided new houses to almost all households whose houses were destroyed in three contiguous villages. EDM had managed to mobilise sufficient resources, mainly from international sources, to be able to provide a large volume of post-disaster housing. It was EDM's decision to provide a house to each individual household (or 'nuclear' family, as EDM classified). In the context of widespread prevalence in rural areas of joint and extended households, such a classification led to difficulties during implementation. Several houses were built in the same homestead, provided to households within an extended family; on the other hand, persons such as Ehsan Ali (HH 20), who lived independently within a homestead in a extended family structure with his two sons' families, was not considered eligible. There was also the usual pressure from *matbors* and *mastans* to fulfil 'requests'. Initially when a list was prepared by student volunteers, 1500 households were listed. On screening by EDM staff, it was reduced to 1120, but this led to conflict. The EDM programme co-ordinator who was instrumental in this screening subsequently became highly unpopular. Nonetheless, by and large, the great number of houses provided served to obviate shortcomings in distribution. In addition to the author's investigation, other evaluations

Box 5.5. Post-tornado rehabilitation programmes of NGOs

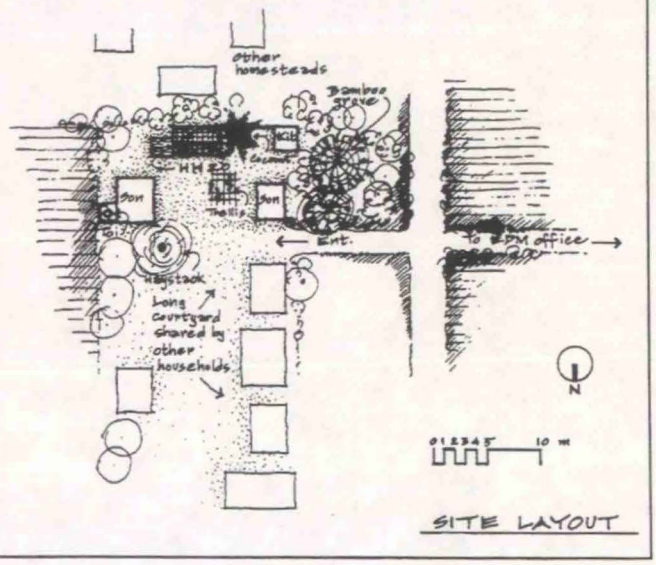
Pre-summer north-westerly storms (*kalbaishakhi*) are common in Bangladesh. However, sometimes these storms, unpredictably, assume such great magnitude that they are classified as tornados. In April 1989, such a tornado devastated a large part of Saturia district. The tornado, moving along a narrow path, with a horizontal velocity of about 40 kms/hour and rotational velocity of 200 kms/hours, lasted for 10 minutes or so, causing great damage. The tornado was unexpected and another had not struck within eight years, but villagers were still fearful; the slightest indication of a storm spread panic.

Large NGOs which could immediately mobilise resources for relief operations moved in to the accessible areas in Saturia after the 1989 tornado and began rehabilitation programmes. For smaller NGOs such as EDM, there was little choice but to carry out their programmes in remote areas with difficult access. Post-disaster competition between NGOs is typical; territory of operation, quantifiable achievement record and local support are some of the aspects of competition. Often several NGOs seek funds from the same sources, leading to such competition between them. Instead of co-ordinated and collaborative post-disaster rehabilitation, NGOs work in isolation in fiercely guarded (often self-defined) domains and each attempt to publicise the achievements of its own work.

of the project also testify to the general gratefulness of the community in being rehabilitated at a time of extreme post-disaster trauma and disorientation (Uddin 1993, p. 18).

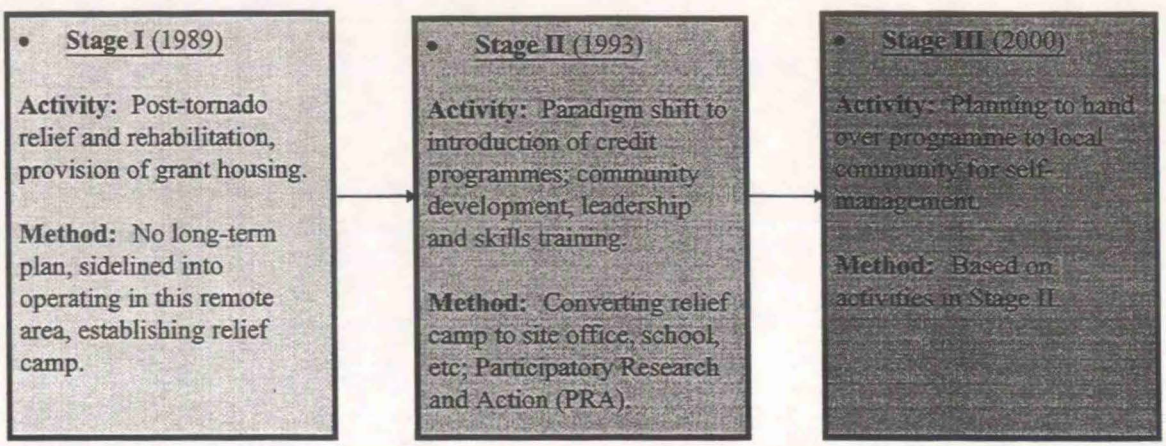
As part of EDM's development model (see Fig. 5.8.), in its new initiative to provide houses on credit, distribution by selective provision caused no problems; there was very little response, even though the houses were subsidised by 50%. The large-scale provision of grant housing in the area had bred a 'relief-culture' or welfare dependency, and villagers hence were reluctant to participate in credit programmes. Instead of having to screen aspirants, this time it was necessary to find them. EDM fieldworkers aggressively promoted the new housing programme, attempted to motivate villagers and gave verbal guarantees. Ehsan Ali (HH 20), rejected in the previous grant housing, now became a subject of attention:

Fig. 5.7. Ehsan Ali (HH 20) lived independently within an extended family homestead with his sons' families



> They apologised for overlooking me previously, and said they would give me a new and better house at very low cost. They said that it was a special type of house. I didn't really want the house, but they were requesting me so hard to take it, that I couldn't refuse.

Fig. 5.8. Developmental model of EDM



Vignette 5.2. The apprehensive household

Porimol Kumar Jolodas's (HH 39) household, which lived in a LGED built house in Chittagong, was very suspicious and fearful at the visit of the research team. Behind the facade of hospitality of colas and snacks, questions were levelled steadfastly: 'Why are you here?', 'Who sent you?', or more point-blank, 'What do you really want?' No amount of explanation of the purpose of the research and the visit sufficed to quell the suspicion. Porimol's nephew Loton (a friendly young man whose acquaintance the researcher made during a reconnaissance pilot field visit the previous year, a key informant) explained: 'For us poor people, there are many dangers and calamities; we always fear for the worst.'

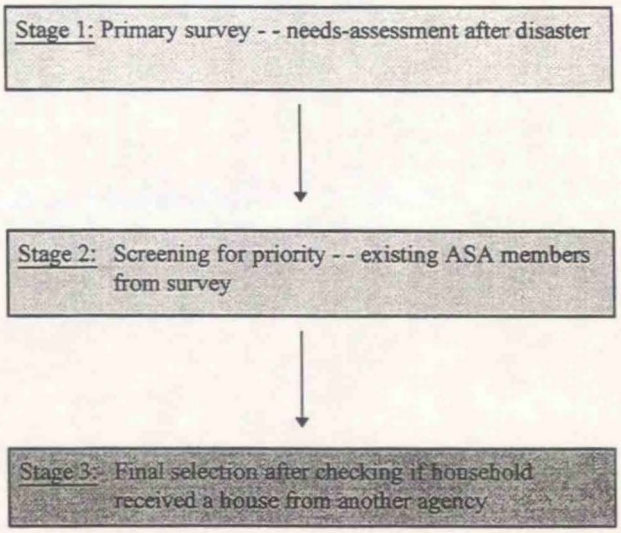
Given the problems of the contractor's corruption and poor construction in this project, related conflict and consequent loan default, the household's suspicion was understandable. After the mayor's ceremonial inauguration of the project, visits by foreign UNDP (the multi-lateral funders of the project) staff, government officials, and so on, it was not surprising that the household did not trust outsiders, however sympathetic they might seem. Notwithstanding this, the researcher sensed that the household was hiding something; in spite of providing much information, some questions remained unanswered. Although the men of the household gradually became somewhat relaxed and reassured by the research team's disclaimers, the women remained apprehensive until the end.

Usually severe problems arise when a small number of houses in proportion to aspirant households are distributed. In the LGED housing rehabilitation after the 1991 cyclone in Chittagong, it was planned to distribute 100 houses among 500 affected households. The first phase consisted of 50 semi-*pucca* houses. Extended discussions with a beneficiary, Porimol Kumar Jolodas (HH 39) and his household, showed that they appeared not to understand questions about selection of beneficiaries, in spite of these questions being explained persistently and in detail. It seemed that the household was not willing to divulge such information, suggesting possible corruption in selection. There was serious conflict between rejected aspirants and LGED staff. Such a selective provision of generally coveted semi-*pucca* houses is bound to have some form of unethical dealing. Indeed, this project was rife with corruption; the contractor used very poor quality materials, and shortly after completion the houses began to deteriorate severely. Beneficiaries spoke of an allegedly overall conspiracy of corruption: according to them, 50 houses were all built and completed at the same time so that there would be no scope for judging quality from precedent. Whether there was such a devious scheme or because there was a terrible outcry by beneficiaries, the second phase was not carried out.

Beneficiary selection is a stage in implementation often rife with corruption; whether beneficiaries are interested in participating or have the potential to do so productively is usually not a criteria in selection. In relatively large-scale post-disaster housing projects, when there is a sudden influx of welfare commodities, including housing, local influentials become highly active in furthering their interests. Anecdotes in this regard are far too many to list here comprehensively; only a few can be cited. When WVB began its flood-rehabilitation programme in Faridpur district, it had to concede a 'quota' of 50 houses to the Union Council chairman, who then distributed them according to his patronage. There were also 'quotas' for *matbors*, who charged low-income households for securing for them a WVB house. Similar quotas were also maintained by other NGOs such as ASA and Caritas; a Caritas staff member understated it euphemistically as 'only 1% flexibility'. According to RDF staff, there was no corruption in their project as both the chairmen in the

Unions where RDF had worked had higher education and university degrees. Field investigation did seem to show that RDF beneficiaries were indeed very poor and hence deserving of welfare. However, that does not shed light on the question of how only 155 households were selected from a very large population of similar aspirants. Perhaps well-educated administrators with political will might be less prone to corruption, but they are bound to experience pressures. Their ideology of integrity can usually be implemented only within a limited sphere and in small projects such as RDF. It was not possible to find out why RDF discontinued its community development programme after only a few years of operation; the unwillingness of programme and related staff to discuss it prompts a question: could it be that the stringent selection policy of RDF caused local influentials to create difficulties in continuing its operation?

Box 5.6. ASA's three-tiered selection process



Corruption manifests itself in various forms and on different levels of project implementation in a context where it is endemic. For example, in the ASA post-tornado housing project, when supply of materials was being transported by lorry from outside to the locality, drivers were harassed on the road by the police and other officials on the pretext of investigating the materials. Without paying them bribes, it might not have been possible to transport the materials. Of course, the usual problems of 'requests' during beneficiary selection were there, and in this case the TNO himself stepped in and sent a complaint letter to the ASA head office in Dhaka, accusing the ASA local office of tampering with the beneficiary list. According to ASA staff, he had complained because ASA did not grant his 'requests'. During implementation, paid hoodlums interfered with the project's operation. Some households managed to obtain several grant houses from different agencies, whilst some very poor households without connections did not receive houses. It was evident that that an idealised selection process envisioned by ASA staff, outlined in Box 5.6., was practically impossible to comply with. Beneficiaries who had received houses through connections, that is, having compelled ASA to provide them houses, subsequently had a poor relationship with ASA. Some of them, such as Nazmul Islam (HH 23), accused ASA of corruption:

> The CI sheet for the roof is very thin and of bad quality. Originally very good CI sheet was brought in from outside, but it was sold off locally and substituted with these thin sheets.

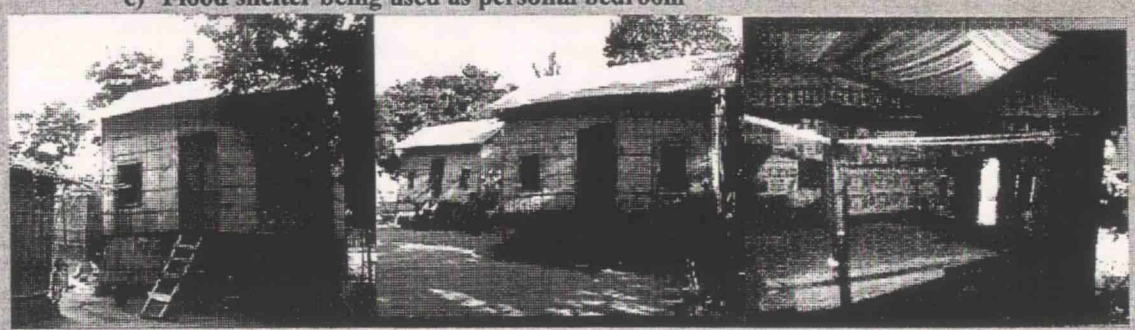
Box 5.7. Community 'mini flood-shelters' built by CCDB

After the major floods of 1988, the NGO CCDB (Christian Commission for Development in Bangladesh) undertook a programme to build elevated buildings (see HH 6) in Amdala-Shibalaya, Manikganj, to serve as community flood shelters. Each shelter, roughly the size of a rural house, was built on a homestead of a CCDB member, with the expectation that during floods neighbouring households could find refuge there. During normal times, the shelter is expected to be used for community purposes, such as a meeting room or a study for the village children.

There were more than 25 aspirant households, but only 10 were provided with such shelters. The criteria for selection remains unclear. It might be expected that in the planning of such a programme, shelters would be scattered throughout the area, so as to serve groups of households around each shelter. However, on a field visit, it was discovered that there were three shelters in a row on adjacent homesteads. It appears to be due to corruption where beneficiaries related to each other managed to obtain shelters right next to each other. On closer inspection, it was found that the shelters were used for household personal use, and it seemed unlikely that members of the community other than close relatives would be allowed to seek shelter there during floods. This was especially true for households well-off enough to have spare space on the homestead site, such as Vanu Akhtar's (HH 6), which might not wish very poor neighbours to seek refuge on their property; this was confirmed during the 1998 floods. On the other hand, when a shelter had been provided to a poor household, such as Alaya Khatun's (HH 7), it was sold off to acquire other items of priority such as land, thus using a commodity intended for the community as a personal asset.

More than eight years after construction, the shelters were deteriorating; the wooden ladders exposed to the weather had all but rotted away, as had the bamboo walls, and the metal clamps and bolts securing the timber stilts to the foundation blocks had badly rusted. During the field visit, a disgruntled beneficiary complained to an accompanying CCDB staff member: 'Everything is falling apart - ladder, walls - everything! Who will repair them? I don't have the money.' The staff member said that this should be mentioned at the community forum meetings; CCDB would see what could be done. This problem had been persisting for a few years, but CCDB had not taken any action. It appeared unlikely that it would. From an NGO's point of view, not much can be gained by spending international funds on repairing old houses; using that money to build new houses appears better on record, testifying to the NGO's quantitative achievement.

Fig. 5.9. a) Flood shelter on HH 6's homestead
b) Several adjacent flood shelters
c) Flood shelter being used as personal bedroom

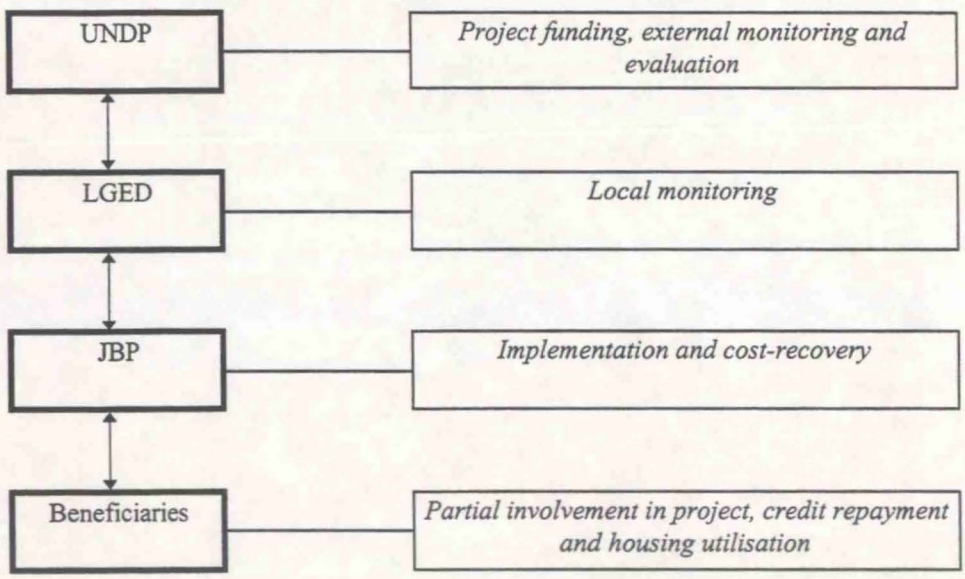


a b c

In such an extensive network of corruption, it is difficult to understand where its roots lie and the extent of its outreach. To add to this contextual basis of corruption, the abrupt influx of international funds for post-disaster projects often overburdens the existing management of implementing agencies, creating further opportunities for corruption. In the WVB flood-rehabilitation project, when it was decided to build a large number of houses (because of the availability of funds), processing tenders, selecting contractors and other related formalities consumed so much time that it was six months after the floods had receded before construction

began. Because of the delay, when work eventually commenced, there was tremendous pressure on local fieldworkers, and also on the contractor's team, to execute the project rapidly. Thus, to respond to the pressure for haste, the contractor began to 'cut corners' with materials and the quality of construction (Hodgson 1990). It is amazing that, considering the high volume of cash in site offices during the project, only one case of theft was identified (Mitchell and Slim 1990, p. 30). It would be reasonable to assume that in this situation of sudden inflow of large amounts of money into a generally impoverished context, there might be other cases of misappropriation which failed to be documented.

Box 5.8. Organogram of JBP housing project partnerships



The usual model of partnership (see Box 5.8.), where multiple agencies fulfil separate roles as funder, implementor and monitor, also creates an opportunity for lack of accountability, consequently breeding corruption. In a housing project in Bhola, UNDP (United Nations Development Programme) provided funds to the government to involve an NGO, JBP, in implementation. LGED (Local Government Engineering Department) served in a supervisory monitoring role. Beneficiaries were involved in transporting materials and helping workers during construction. The project policy recognised the need for combining a loan for income generation with the house provided on credit, to facilitate repayment; each housing beneficiary was supposed to be given a Tk 3000 cash loan for this purpose. However, in the field it was found that many beneficiaries had not received this money. Some of them stated their interest in receiving a credit house to be linked to the cash loan. As related by Nurunnahar Begum, a JBP beneficiary:

> The possibility of obtaining cash (which we greatly lack) motivated us towards JBP's housing programme. If we knew that afterwards we wouldn't be given the money, we wouldn't have taken the houses. Tell them [JBP staff] to take their houses back and return the money we have paid so far, together with the Tk 3000. We will build a straw house instead and use the cash for our other pressing needs.

Vignette 5.3. Friend or foe?

Some of the JBP beneficiaries showed great fear of JBP staff. Masuma said that when the research team arrived in the area the previous evening and, accompanied by JBP staff, were looking for beneficiaries to meet, she was hiding: 'When JBP staff visit, we are frightened that they have come to take away the houses they gave us because we are not repaying the housing loans.' During the field visits, especially when measuring JBP houses, children were often heard saying that that the research team was planning to dismantle and remove the houses. Korim, a rickshaw driver, narrated how his house had been confiscated by JBP when he was not at home, then given to another household. When asked about this, JBP staff said that they sometimes do confiscate some houses to create fear, so that beneficiaries repay their loans.

Roughly translated, JBP stands for 'friends of the people of the country'. However, witnessing the conflict with the local community which it supposedly 'befriends', and the situation of terror that had developed, one cannot but wonder which word to use, 'friend' or 'enemy'.

According to JBP staff, the income-generation loans were provided selectively to beneficiaries who were considered capable of undertaking successful income-generating enterprises; it was claimed that about 400-450 beneficiaries out of about 600 were given the cash loans. This explanation would have been more or less acceptable, were it not for Kajol Mia's (HH 14) account: it seems that shortly after project completion, Kajol Mia was told by JBP staff that if 'foreign visitors' ask him about the Tk 3000 loan, he should tell them that that he had received it, even though he had not. Most probably 'visitors' refer to UNDP (the funder) staff who were expected to visit the project. ('Visitors' did not arrive, and Kajol Mia was spared from lying.) This suggests that loans which were never disbursed were noted on official records and perhaps siphoned off by JBP staff, who then sought support for this scheme from beneficiaries through instructions like those to Kajol Mia. It was not possible to ascertain if LGED colluded in the scheme, but even if it did not, it certainly did not carry out its monitoring role very effectively. In fact, all implementing partners were responsible for the corruption. If the role of the funding partner (in this case UNDP) is restricted only to top-level administration and supplying funds to the government without involvement in the project at the field level, it paves the path for corrupt local implementors. It is understandable that UNDP might not have preferred a top-heavy, pervasive monitoring role, but surely such a position does not warrant no field visits at all and reliance on whatever records implementing partners supply. While closer relationships between partners are important, whether that is sufficient to prevent corruption can be debated; in a context of devious networks of corrupt schemes, how much an external organisation can temper corruption remains open to question.

Finally, beneficiaries in the JBP project - partners at the lower end of the partnership hierarchy - also had their contribution to the corruption network. After the change of government, the position of JBP weakened in the area, as it was affiliated to the former ruling party. Most beneficiaries began to default on loans, which JBP claimed was a consequence of the political change. The same beneficiaries who were defaulting on the housing loans were also most vociferously demanding the Tk 3000 cash loans. What was the possibility of these households repaying this loan, when they were defaulting on the previous loan? Perhaps the households were principally interested in exploiting the politically weak position of JBP by demanding the cash loans without any intention

of repaying. Nonetheless, for such households, corruption is also a survival strategy. In a context generally permeated with corruption and poverty, the appeal of this strategy is self-evident.

5.3.2.2. Construction: community involvement in exogeneous building techniques

When EDM implemented its disaster rehabilitation programme, one of the objectives was to build housing more hazard-resistant than traditional construction. To apply an improved construction technology, it became necessary to fabricate components in Dhaka, instead of the isolated rural area without even electricity. Despite being more durable, such houses were prone to deterioration within ten years or so, evidenced by their condition eight years after construction. Without possibility of recourse to local replication, and in a context of widespread scarcity of financial resources, beneficiaries would have to return to former housing standards within measurable time. The intervention thus represented a temporary improvement, an ephemeral stage in the life of villagers. Realising that they might eventually have to live in a thatch house again, many beneficiaries sold off metal building components, to be recycled for other uses such as in shallow tubewells, and used the money to further household aspirations. Shahjalal Ali (HH 22) is such a beneficiary who decided to accelerate eventual return to a thatch house, in the process managed to acquire enough funds to supplement the cost of purchasing homestead land.

In the next phase of attempting to promote housing on credit, EDM decided to use a different construction technology: pressed earth block walls instead of bamboo mats (because bamboo mats decay within a short time), and micro-concrete roofing (MCR) tiles instead of CI sheet. Instead of prefabricating components and employing an outside contractor, a local contractor and workers were employed, and training was provided in fabricating and working with these non-traditional products (part of the development model shown in Fig. 5.8.). Nonetheless, imported machinery (a tile making kit bought from Parry Associates, UK and an earth press donated by the Swiss government) had to be brought in and a workshop was built in the EDM site office. Because of subsequent lack of acceptance by the local community, these machines began to sit idle and collect dust and rust. It is difficult to envisage the future use of these small 'white elephants'. Local workers who were trained had no scope to exercise their new skills. All the effort seems to have been in vain.

5.3.2.3. Participation: demarcated involvement

The involvement of beneficiaries in many of these projects was limited to helping the contractor's team to carry building materials or components to construction sites, bringing soil for levelling sites, digging holes, etc. As in the typical contractor-built mode, much of the supply of materials and components was from outside the locality, transported as close as possible to construction sites by lorry, and subsequently by local transport such as boats or rickshaw vans. When it was not possible for vehicles to go further, beneficiaries were involved in manual carrying. There are variations within this typical mode, depending on the nature of building materials and location of sites. In the EDM project, almost all the components were prefabricated in Dhaka. Transporting large components such as MS components, timber roof frame, doors and bamboo mat walls to an

isolated location entailed several changes of transport, and many rounds of lifting, loading, etc, causing major difficulties in handling. Thus the decision to involve beneficiaries at the route's end may not have stemmed so much from EDM's desire to facilitate community participation as from the contractor's wish to relieve his workers. Also, this involvement reduced the cost of labour for the contractor. However, this may not amount to taking undue advantage of free labour. The beneficiaries possibly acted out of their self-interest in obtaining free houses. According to EDM staff, although there may have been available local construction workers, it was decided to employ an outside contractor, because after the tornado everything was in disarray and locals were generally not in a position to provide such services. But, the initiative demonstrated by beneficiaries in assisting the contractor's team seems to contradict EDM's line of reasoning. Employing local construction workers might have injected much needed employment in the aftermath of the disaster; but that would have required a very different implementation policy.

In the LGED project, beneficiaries went somewhat beyond menial involvement. As there was in-situ RC work, Porimol Kumar Jolodas's (HH 39) household assisted in bringing water in large metal containers and regularly attended to curing the concrete. The results of this participation was far from satisfactory to the household. As Porimol said:

> We tried to get as much involved as we could. We weren't shown any drawings at the meetings we had with LGED staff before construction began, but we saw them on our own through the contractor. We even fed his workers. We were always around and offered our help and suggestions, but the contractor didn't pay much attention to us; he or his workers didn't bother to listen to us. If we had known that he was using such bad materials, we would have been more alert. Now we feel like losers after all the help we gave him to build these horrible houses.

Such misgivings did not stem from regret at participation (albeit limited), rather it was a result of the poor construction in this project. If they had been well-constructed houses, the households might even have taken pride in having participated. As it stood, beneficiaries bore such hostility to LGED staff and the contractor, extrapolated to the government in general, that in future it may prove tremendously difficult to forge institutional relationships with them, or expect co-operation in development projects in the area.

One of the common modes of involvement used by agencies is to make supply of building materials and/or components available to pre-selected beneficiaries, assigning to them the task of transporting materials, etc to building sites. The contractor's team accompanies beneficiaries during transport (or they make their own way) and commences construction when materials and components reach the site. A frequent problem is ambiguity about payment for transport: Kajol Mia (HH 14), a beneficiary of JBP housing, reported that he paid Tk 300 for transporting materials, and also provided meals to the pushcart pullers and construction workers. However, according to JBP staff, no beneficiary paid for transport; it was supposedly covered by JBP; if Kajol Mia had provided meals, it was his gesture of hospitality, and did not concern JBP. Similar claims of paying for transport were made by ASA beneficiaries of post-tornado grant housing, but

were dismissed by ASA staff: 'Maybe they still expect more from us by demanding reimbursement for transport; after receiving so many hand-outs, they have got spoilt and now want more and more.'

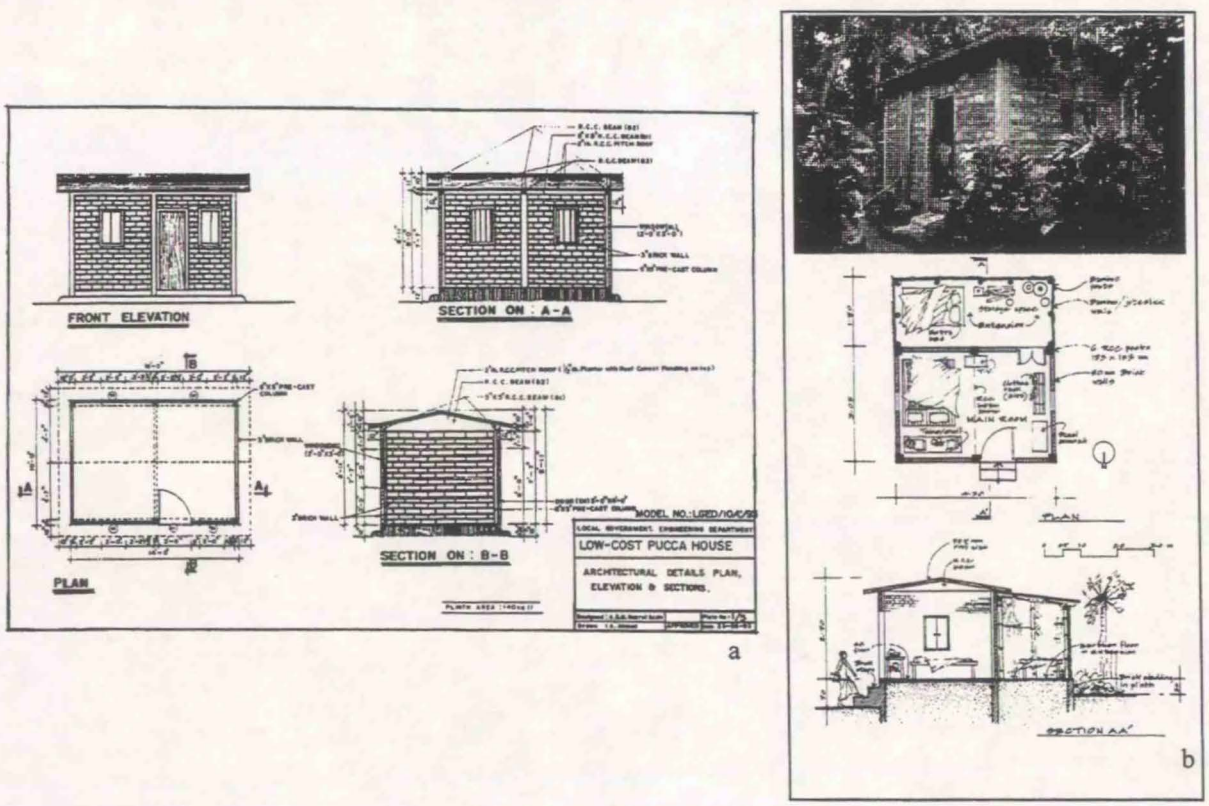
The gap between these contrasting reports could be explained by positing that transport bearers, in the absence of knowledge of beneficiaries, have a payment arrangement with the agency and exploit this situation, charging beneficiaries for transport. Transport bearers, often with low incomes themselves, understandably seek such opportunities and thus benefit from the circumstances, but at the expense of other low-income households, consequently breeding mistrust between agency and beneficiaries. Demarcation of involvement can readily create ambiguity if the domains are not well-coordinated; this can further be augmented by the lack of consultation with beneficiaries and transparency of information. Based on previous experience, Caritas staff foresaw the possibility of such unwarranted dealings over transport and thus relegated transport costs to beneficiaries in their project. As this was a grant housing project, staff assumed that, receiving for free a relatively costly commodity such as a house would be an incentive to beneficiaries to cover transport costs, a small fraction of the cost of the house, thus contributing to a sense of participation and ownership. This assumption might prove accurate under normal circumstances, but in this case it was post-tornado housing, and in such a situation households often require all their savings to overcome setbacks caused by the disaster. Even the small sums of money for transport costs in the Caritas project became onerous to very poor households. Only for relatively better off households, such as Shehab Ali's (HH 32), did Caritas's assumption hold true. In fact, even though beneficiaries in the Caritas project were not expected to take part in construction, which was assigned to a contractor's team, Shehab and his household members could not wait for the workers to complete construction and crossed the boundary of the assigned domain of their involvement. They joined in without being asked and out of their own initiative took part in construction extensively.

In most projects beneficiaries are not associated with acquisition of materials and production of components. Essentially, a pre-fabricated house-building kit is produced by agencies and then supplied to beneficiaries to be taken to sites owned by individual beneficiaries; a team of workers is also provided by agencies. In such an arrangement, the scope for involvement of beneficiary households is quite limited - simply a matter of transporting and installing components on site, and it is common to complete construction in a few days. On the other hand, in *in-situ* construction, especially on a site owned by a beneficiary household, there is more scope for household participation. This is illustrated by Enamul Ali's (HH 26) household, which received a small *pucca* house on credit from LGED-ETDA. Although in some other projects RC posts were produced in the agency's premises and transported to the building site, because of this specific type of house, there was no alternative but to cast the RC roof and cement concrete floor on site, as well as to construct the brick walls there. Enamul's son-in-law, Bashir, had construction experience and on his initiative household members became very involved in the project. They collected water-hyacinth from surrounding water bodies for curing the concrete, a method common in rural areas.

In addition to assisting in and supervising quality of construction work, the household managed to incorporate design elements according to their requirements, lacking in the standard house design produced by an LGED engineer in their Dhaka main office; an extra door and a ventilator were added during construction, and windows were positioned according to the household's preference. Bashir even wanted to pay extra (on credit) for a higher ceiling and cement plaster on the exposed brick walls, but this was not allowed by LGED on the grounds that there was no budget for that. Of his household's involvement Bashir said:

> If we didn't do it, the contractor wouldn't have bothered to cure the concrete for the 21-day period. Some of the workers weren't well-trained in this kind of work, and I had to show them what to do; I hope they have learnt from this experience. The quality of work would have been much poorer if we hadn't got involved.

Fig. 5.10. The standard LGED design (a) was modified during construction by Enamul Ali's (HH 26) household to build a house (b) partly according to its needs



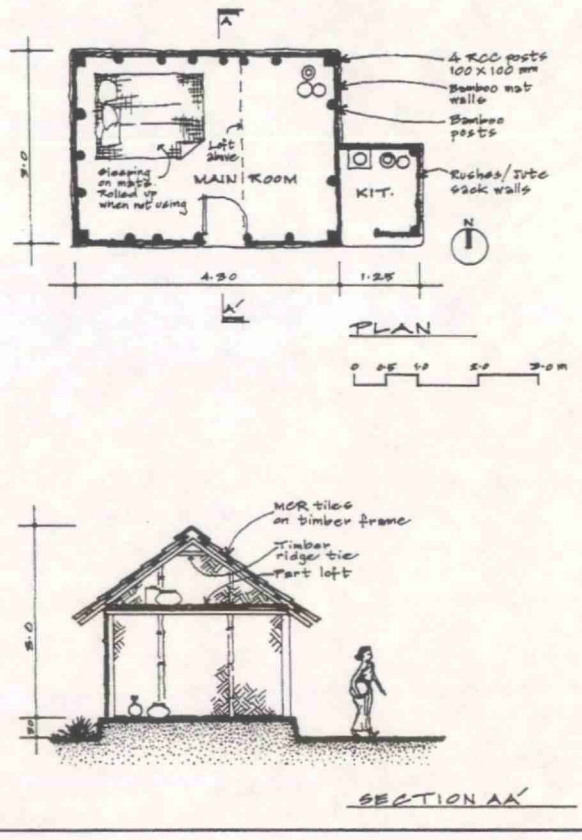
Although this illustrates participation of a household to maximise its own requirements in housing provided by an agency, there were many factors particular to this project. The type of construction, the household's having a member knowledgeable about construction and its relatively better/stable income, allowed it to become involved in a productive way. For a household with a different profile, participation might indeed become a burden. For example, in the Rural Development Foundation (RDF) project, households were selected according to their economic vulnerability, giving priority to single or widowed women. At the same time, to involve households, workers appointed by RDF only constructed the roof on RC posts and brought bamboo mat panels supplied by RDF to the site, leaving the beneficiaries to complete the rest of the construction. In this case, criteria for targetting beneficiaries and their participation became incompatible. Jasmin Ara (HH

29), a widow with two small sons, out of self-interest, to receive a grant house from RDF had to overcome limits imposed by *purdah* (traditional seclusion of women). She had no choice but to assist the male construction workers:

> They [construction workers] asked me to fetch soil and water, help to lift things and to keep an eye when they took breaks. Women don't do such work, but what could I do? I had nobody to help me.

Jasmin was the recipient of a coveted grant house, provided to four households out of more than twenty aspirants in her neighbourhood. Her rejected neighbours felt grieved at this selective provision, and even three years after she received the house, some were still expecting RDF to provide them with houses. Despite their aggrieved feelings, when the workers left Jasmin with the incomplete house, she was compelled to ask for her neighbours' help. Participation in the construction of her own house became a burden, especially when she had to request assistance not willingly forthcoming.

Fig. 5.11. Jasmin Ara (HH 29) was compelled to complete construction of walls after RDF workers built the frame and roof



It appears that in the RDF project, participation was added as a token gesture to appease international donor concerns, Oxfam USA in this case. As mentioned in Section 5.3.1., the concept of beneficiary participation permeates the literature of international development and voluntary organisations, much of it conceptualised in general terms. When these concepts are applied in specific circumstances, participation appears a blunt tool, and a great deal of fine tuning is required which local agencies are ill-prepared to do. To add to conceptual problems, local behavioural factors such as corruption serve as impediments to effective participation. To provide an example: in a WVB flood-rehabilitation housing project, the contractor saved labour costs by involving beneficiaries in construction; beneficiaries assisted out of self-interest and did not expect payment. He then billed WVB for labour charges, not divulging that he had employed the free labour of beneficiaries. There might be benefits derived from participation, but quite often they do not accrue to beneficiary households. Thus when an NGO such as RDF prepares its official project report, it shows documentation of beneficiary participation, satisfying stipulation for it by Oxfam USA. However, the actuality of that participation in the field may remain unreflected in the project report.

An insight into a somewhat dichotomous attitude towards participation, from an institutional point of view, was provided by an ASA staff member. On one hand, involvement of unskilled participants in construction can adversely affect the quality of work; inadequate ground penetration of posts in some ASA projects was cited as an example. This is certainly a realistic observation and indiscriminate involvement may indeed yield poor results. On the other hand, participating in construction provided the opportunity to households to generate income. Even though several other agency staff members found this economic interpretation of participation quite satisfactory (indeed, some adhered to this as the only valid interpretation), in practice it may prove problematic. The WVB project example above illustrates how such an arrangement can promote exploitation. In a context where a large part of service transaction is undertaken outside a formal fee structure, participation in economic terms may undermine the basis of welfare in low-income communities. Subsistence households may invest valuable working time without adequate compensation, creating a potential source of conflict and eventual dissatisfaction, especially if the quality of materials and construction is not up to the mark.

In all the cases of household participation, involvement was largely restricted to the construction stage and almost never in policy and decision making, such as during beneficiary selection, selection of contractor and workers, materials supply, design and construction technology. In most of these activities, conducted independently of beneficiary input, there was scope for institutional corruption, of which the expense was borne by beneficiaries because they did not have the opportunity to further their self-interest.

5.3.2.4. Post-construction issues: whose responsibility?

In all the projects of different agencies there was one thing in common: over time, houses began to fall into disrepair and households did not have the ability or willingness to maintain them. Beneficiaries generally expected some kind of follow-up by agencies, but these were mostly one-off projects and agency staff expected households to carry out maintenance. Even in the notoriously ill-constructed LGED project, agency staff blamed beneficiaries for lack of maintenance; in practice, maintenance of poor quality semi-*pucca* construction demanded too much household resources. Besides, it would be impossible to maintain brick walls constructed with such a high sand content in the mortar. Or in the case of EDM, unprotected MS posts embedded into the ground in wet sub-soil conditions cannot be expected to last long, however hard one tries to maintain them. As shown in Box 5.7., repairing houses is an activity most NGOs are reluctant to pursue, because it does not assist much in boosting their achievement records, a pre-requisite for obtaining sustained international funding or seeking new funds. Thus in most cases, projects which provide beneficiaries with 'improved' housing with more durable, manufactured materials (necessitating services of a contractor) are implemented, thereby enhancing the quantitative track record of the agency, but over time such houses become unaffordable or troublesome for low-income households to maintain, paving the path for antagonism between agency and beneficiaries.

Despite participation by beneficiaries, complaints of a nature similar to that in completely agency-built projects were expressed after project completion. This demonstrates the limited nature and success of participation; when choice of materials, building design, method of construction and other such crucial aspects of the housing process are agency decisions, and the bare-basic involvement of beneficiaries during construction comprises the only form of participation, post-project dissatisfaction is perhaps inevitable. There were two main aspects of these complaints: firstly, in many cases, building materials (such as bamboo) had begun to deteriorate. Secondly, according to beneficiaries, follow-up and interest in condition of houses by agency staff was generally lacking.

The first complaint may not necessarily be related to quality of construction during project implementation, but rather to the intrinsic propensity for deterioration of natural building materials. However, there were exceptions to that: in the RDF project, the choice of micro concrete roofing (MCR) tiles in a region with an abundance of coconut trees entailed subsequent breakage from falling coconuts, much to the aggravation of beneficiaries (discussed in detail in Section 7.4.3.1. on MCR tile in Chapter 7). The second complaint was generally refuted by agency staff, who provided a variety of arguments. For example, according to ASA staff, after providing houses to selected victims of a tornado, on field visits they were beseiged by mobs of villagers aspiring to grant houses, making it extremely difficult even to inspect the recently built houses, let alone discuss with beneficiaries their problems. In any case, a paternalistic attitude was evident in a staff member's comments:

> How can they even think of complaining? They had no houses after the tornado and we helped them out. They should be grateful to us. They should be glad to get free houses, even if they are of bad quality.

Does provision of free houses exonerate an agency from responsibility for post-project follow-up? The alternative to a long-term view of working with a community to gradually improve its housing is to provide houses after each disaster (if funds permit), augmenting the 'relief-culture'; such a policy can be roughly interpreted as a discrete series of one-off projects, attending only to the immediate needs of a community. However, there are arguments for detachment after project completion: to express it metaphorically, it is the agency's task to assist in enabling a household to stand up; after that, walking on its own feet is the household's responsibility. The basic argument is that this approach promotes self-reliance and mitigates the 'relief-culture'. According to staff of the JBP project, the 'relief-culture' was responsible for the lack of maintenance by beneficiaries: 'We always tell them that the houses belong to them now; they should take care of them themselves.' In general, in most of the houses provided by JBP, the bamboo mat walls had begun to deteriorate; an exception was Mohammed Edris (HH 13), who had carefully maintained his house by regularly coating the walls with sump oil. Such maintenance ought to be generally affordable, especially in the light of its long-term benefits. It was observed during fieldwork that in many self-built houses made with natural materials, the owners invested great effort in their upkeep. Why is such care lacking in institutional housing?

Two reasons may explain it: firstly, the limited nature of participation during project implementation is possibly not conducive to encouraging a sense of belonging. As a JBP beneficiary stated: 'These houses don't really belong to us, they belong to JBP. We are just allowed to live in them. They [JBP] can take them away at their own will.' Therefore it is expected that the agency is responsible for maintaining houses. Secondly, as suggested by agency staff, receiving houses (especially as a grant) fosters the 'relief-culture', where beneficiaries assume that if houses deteriorate, the agency provides new houses again. These two aspects compound each other, contributing to the complexity of the problem. The link between this problem and the method of implementation is clear, hence this discussion.

It was found that post-project institutional follow-up on a broader level is also lacking. In most cases, international donor agencies (or partners) relegate the responsibility for project evaluation and monitoring to local partner organisations. It seems that partnership is restricted to the involvement of international agencies at the project formulation stage; if a project appears reasonable to donors, funds are provided for it and a post-project report submitted by the local partners is considered sufficient evidence of proper utilisation of funds. Very often these reports contain quantitative records, e.g. number of houses built, cost, etc, and hardly any qualitative documentation of problems encountered during implementation. An outstanding example is that of the JBP project where there were no post-project visits by donors. Nevertheless, it is customary for some donor partners to conduct periodic evaluations and sometimes send representatives to project areas, but this is generally done in the context of overall development programmes and seldom specifically for housing projects. Hence, the representatives are personnel with general expertise and not necessarily qualified to evaluate housing. (An exception were the WVB flood and cyclone rehabilitation projects where extensive evaluations by donors, employing suitable experts, were carried out [see Hodgson 1990; Mitchell and Slim 1990; Palmer-Jones *et al* 1992)]. In most cases, local obstacles of language and intrepretation do not allow outside evaluators to gain a comprehensive understanding. Dependence on local partner organisations for information and interpretation of beneficiaries' viewpoints do not result in an impartial project assessment; the voices of low-income communities, the users of the projects, remain largely unheard.

5.4. SELF-BUILT: SYSTEM OF AUTONOMY

For most rural households, it is common to undertake house construction without institutional involvement, with the owner responsible for implementation and management. This is generally known as self-built or self-help housing, and is characteristic of most traditional housing, not only in Bangladesh, but also in many other parts of the world (Oliver 1987, p. 11). Self-help does not necessarily imply that a household possesses all the skills to construct a house entirely on its own; quite often the services of local specialist builders are required. For construction with CI, timber, or other such relatively expensive materials, more specialised *mistris* are employed, and general construction workers or *kamlas* build houses of natural materials. For earth houses, there are often region-based specialised workers who are neither *mistri* or *kamla*; such workers comprise a distinct category of indigenous construction labour. In self-built housing, requirements of

construction are generally understood by the household, and often the specialist's role is primarily in building the roof, usually the most complicated part of the construction. Household members assist in menial tasks - in building the plinth, erecting the structural frame and making the walls, often under the direction of the specialist. Supervision is by dominant household members, and it is common for the household to be completely involved throughout the construction process.

Traditionally, specialist labour in self-built housing was part of a system of transactions in kind. However, due to the expansion of the cash economy, throughout most rural areas such labour is now predominantly paid for in cash. Increasing demographic pressure on common property resources and uneven distribution of assets such as land have also affected past availability and free access to natural building resources, resulting in the acquisition of most building materials by purchase. Thus, even though households can implement most house construction on their own and there are adequate local building skills, labour and household initiative, financing presents formidable problems to many low-income households. Several of the self-built houses discussed below used external funding (often from agencies), and thereby implemented house construction on their own, approximating to the typical system of labour for self-built housing. Because of this institutional involvement, in some cases new patterns of implementation have emerged which provide support to the self-built housing process (distinctly different from the categories of agency-built housing discussed in Section 5.3.). Nonetheless, it should be noted that in all forms of agency-supported housing, whether agency-built or assisted self-built, inaccessibilty for households is usually due either to exclusion by agencies (mainly because of resource constraints) or self-exclusion by household choice. The advantages and problems experienced by households in building their own houses within categories of varying levels or different types of agency involvement and some of the main issues pertinent to self-built housing are discussed below.

5.4.1. Completely self-built

In completely self-built housing, agencies are generally not involved in implementation and building components are produced or acquired by the household and local construction workers. Nonetheless, there are two points worth noting: firstly, although some households acquire loans from agencies, they utilise the funds according to their own preference and the agency has only a small role in implementation (Section 4.3.2. in Chapter 4 discusses such loans in detail); secondly, some households utilise manufactured building components such as CI sheet and RC posts, either bought from the market independent of agency involvement or supplied by the agency. These two points indicate two fundamental changes in traditional housing: one, the variable and increasing nature of the role of agencies, and two, the transition from natural to manufactured building materials. They are not necessarily very recent developments, but are nevertheless points of departure from the traditional mode. In this study they are subsumed within the category of completely self-built housing and are discussed where appropriate.

5.4.1.1. Common property resources: diminishing supply and access

Traditionally, self-built housing relied on the local availability of natural building materials. Local self-managed plantations for organic materials such as bamboo or access to common property resources such as thatching materials and earth were sources of building materials outside the confines of a cash economy. A large section of the rural population still relies on common property resources, not only for building materials but for a whole range of subsistence commodities; this is termed a 'biomass-based subsistence economy' (Toufique 1997, p. 457): biomass is broadly defined as products for human consumption and use obtained directly from plants and animals (Dasgupta and Mäler 1994, p. 1; Islam 1990, p. 20). However, many common property resources have come within the cash economy and are no longer as freely available as in the past. For low-income groups, the result is greater restriction on access and more control by dominant social groups; this process, described by Toufique (1997, p. 457) in the case of inland fisheries, also holds true to a large extent for building materials:

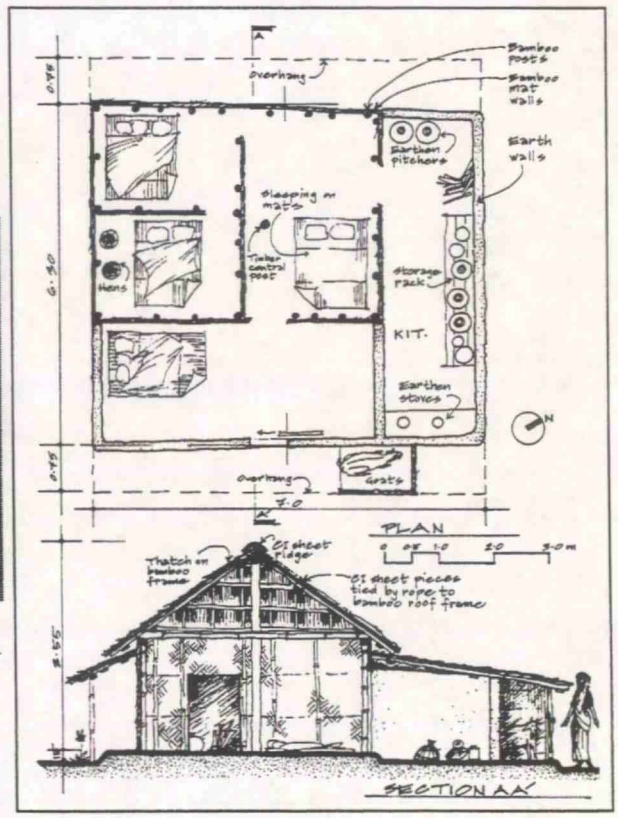
> ... an increase in demographic pressure on resource systems has resulted in capture attempts and breaking up of age-old customs, rules or respect toward traditionally held property rights. In such circumstances the social power of agents becomes crucial in determining their abilities to maintain property rights over resource systems on which their livelihood is crucially dependent. Such conditions open up the possibility of these rights being passed over to more powerful users of the resource or to those agents who are socially powerful but are not the direct users of the resource.

In the case of natural building materials, it has been argued in Chapter 2 that explanations of resource constraints entirely in terms of demographic pressure are insufficient, and social structure, among a variety of other factors, contributes to the phenomenon. There is a two-way causal link between demographic pressure and social structure: increasing population leads to capture, control and enclosure of natural resource endowments by dominant social groups, suggested by Toufique; socio-cultural structure such as uneven landownership and traditional inhertitance patterns amplifies demographic pressure on the natural resource system. An outcome of the expansion of the cash economy is utilisation of common property resources to generate what is known as 'non-exchange income' (Alauddin *et al* 1995, p. 244) in addition to self-consumption; such income has advantages over income generated by capital or human resource investment or exchange income. Hence in a context of poverty and resource scarcity, it is only natural for different groups to compete for such advantages. For low-income individuals with vertical patronage linkages, access to common property resources is relatively easier than for those without such benefactory support, thus intensifying competition within the rural community. This contested use of natural resources and the permeation of the cash economy is evident in several instances of self-built housing, discussed below.

A typical example of a low-income household depending on common property resources and the changing nature of such resource utilisation is Sajeda Begum's (HH 38) household. To begin with, the household settled without legal permit on common property public (*khaas*) land; as this was in a hilly region with relatively less agricultural potential than the plains, there was less restriction on

such settlement. With increasing demographic pressure over time, the tenure security of the household and the possibility of other households adopting a similar settlement strategy may prove unreplicable. With less utilisable land for agriculture, there was more availability of organic resources for building, such as bamboo and thatching materials in the area. However, as in the plains, such resources had generally been captured by socially powerful parties for commercial purposes and Sajeda had to buy them for house construction. The only common property resource that could be freely used as a building material was earth from the hills, cropped manually and carried to site by a team of specialised workers for earth construction. From Sajeda's narrative it was evident that free consumption of even this resource was gradually experiencing restriction. On several occasions, the workers were apprehended by the government Forest Officer. They therefore adopted a scheme of stealth, bringing earth only at night. This is certainly not a replicable long-term strategy, and it can easily be predicted that, over time, enclosure of the land containing this resource might become much more rigourous. The situation also has potential for conflict.

Fig. 5.12. Sajeda Begum's (HH 38) house was built largely of locally available resources of the hilly area



There are regional variations of this situation, but in general terms is related to resource scarcity. When households were questioned about the source of bamboo used in their houses, they often replied that they had purchased it from neighbouring villagers. These villagers are not necessarily bamboo merchants; the informal localised market transaction is linked to ownership of land sufficient for small-scale homestead plantations to generate household income in addition to providing for personal consumption. In the offshore island of Bhola where there are minimal

bamboo resources, timber is the alternative. When Jamal Alam (HH 15) built his house, he had to buy betel nut tree trunks from other villagers: 'Those who own trees can do business; since I don't have any, I had to buy them.' A consequence of such small-scale entrepreneurship is that supply does not always match demand. Koruna Rani Shutradhar's (HH 19) account of the implementation of construction of her house highlights this point:

> It is often difficult to find bamboo locally, villagers don't always want to sell, especially if their stock is low. We had to search in other villages, quite far from here. There is a bamboo grove on our homestead, but production is not enough for everybody in our large extended household. We don't have enough space to plant more bamboo groves, so we have to request others to sell us bamboo.

On the other hand, in the same locality, in a small village shop trading in manufactured building materials, CI sheet was always available and there was seldom any dearth of supply. The penetration of the cash economy into rural areas has paradoxically resulted in the availability of imported building materials, generally unaffordable to the majority of rural inhabitants, while at the same time indigenous, and more affordable, natural materials have become increasingly scarce.

In the study region in Dinajpur district, there is a tendency towards use of agricultural residues for thatching; sugar cane leaves, rice and wheat straw are substitutes for more traditional but also more scarce wild grasses (*chon*). This is one of the prime rice growing areas in Bangladesh, but despite that, only landowning households generally have the opportunity of obtaining such agricultural residues at no cost; others have to buy it from the market. Even households such as Jagannath Ray's (HH 4) and Bhorosha Bala's (HH 5), owning small agricultural plots of about 130 sqm and 370 sqm respectively, could avail themselves of rice straw for thatching. Poorer households with no agricultural land find it highly exacting on their financial resources to buy thatching materials and accessibility to common property resources for thatching is, at best, tenuous.

In the lower floodplains, especially in *chors* and extensively riparian regions, there is greater natural growth of *chon* and rushes (*bon*). But these areas are generally more densely populated because of their greater agricultural potential (Rahman and Huq 1994, p. 18), and hence such natural resources have all been captured, to be sold at higher prices than in other regions. Thus when Sharmila Begum (HH 10) built her house, she spent more than 30% of its cost on *chon*. There are remote *chor* areas, where Shahjalal Ali (HH 22) lived; he could trim *chon* from the riverbank, but he himself expressed doubt about the sustainability of this practice:

> Most landowners are converting their land to agricultural use, yielding more profit, and vacant land where *chon* grows is gradually becoming scarce. *Chon* is nowadays being sold on the market and it is not always freely available. I was lucky to get it this time, but I don't know if that would be possible in the future.

This commercialisation of common property resources entails compulsion on poor households who cannot participate in the market due to constrained finance to adopt alternative strategies, such as seeking funds from external sources, often moneylenders. But this often presents a new set of problems (Chapter 4, Section 4.3.3.2.). The other alternative is to sell off household assets, thereby paving the path towards greater poverty. For asset-poor households, a third alternative is more desperate: resort to devious means to acquire building materials.

5.4.1.2. Incremental construction: feasible for whom?

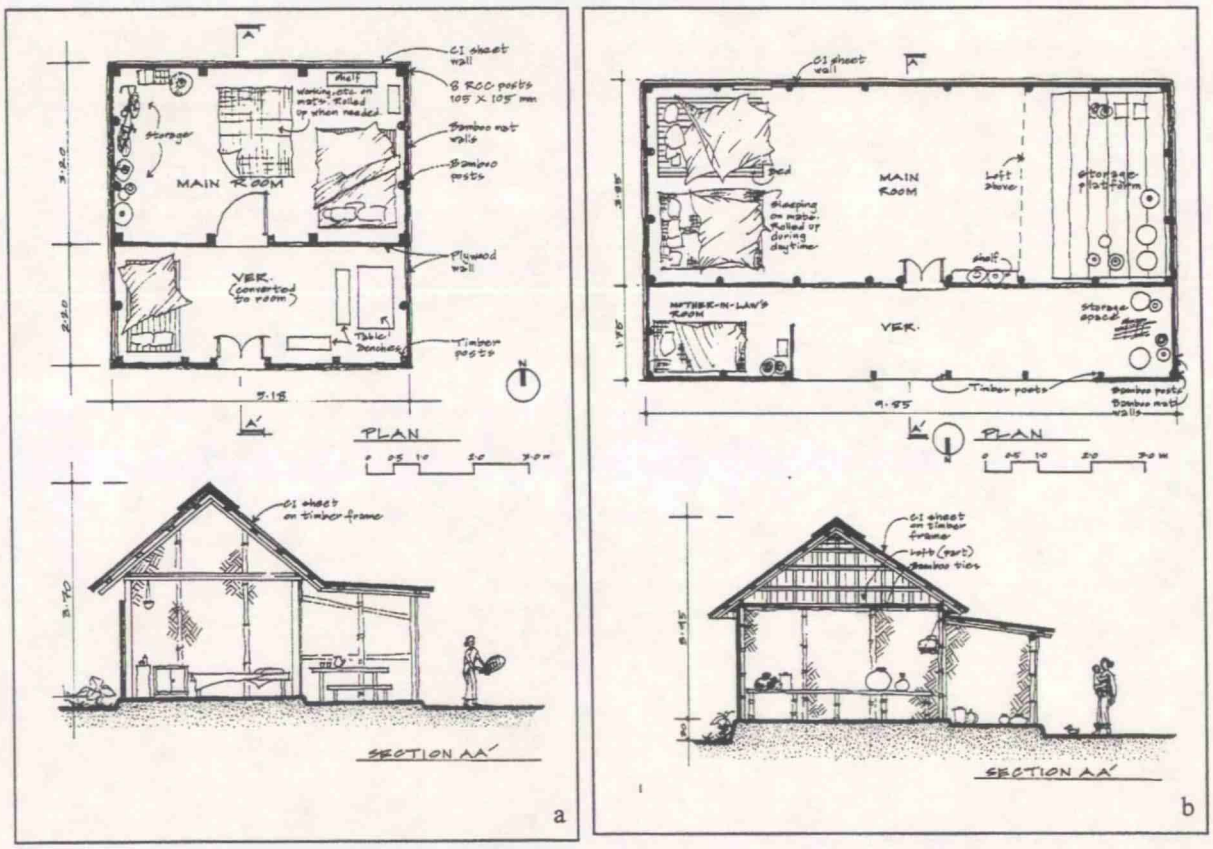
There is considerable literature documenting the incremental nature of house construction in low-income communities of the developing world; an issue of the Architectural Review in 1985 dedicated to 'Third World housing' has articles by various authors relating the incremental process (Benjamin 1985, pp. 32-35; Hamdi 1985, pp. 43-46; Monchaux 1985, pp. 37, 41). This is not restricted solely to self-built housing; even in government-built housing there is often extensive incremental extension (Tipple 1998). However, a certain gap exists in these observations. Empirical evidence from this research suggests that, especially in Bangladesh, incremental construction is carried out by households not among the poorest. Quite often, combined with tenure security, available financial resources, however small and widely distributed over time, are a pre-condition for the accretive transformation of housing. Several of the poorest households observed in this research were unable to afford sufficiently durable building materials that lend themselves to incremental construction. In addition, in some cases it was found that residing on *khaas* land without legal permit inhibited personal investment of a long-term nature.

For such households, the pattern is frequent repair and almost regular complete rebuilding. Less expensive and easily perishable organic building materials that are used by poor households often decay after the monsoons, and the hunt for financial or common property resources ensues every year. Households live in the same size and quality of house for many years due to a lack of significant improvement in economic status, managing with difficulty to renew its materials annually. Unable to upgrade the house gradually, resource scarcity and deepening poverty implies that regular renewal may become precarious.

Some examples illustrate the above points. Lota Bala's (HH 28) house was built incrementally. The household had secure land tenure due to patronage by a local Catholic mission, and also a number of human and material resources (see Vignette 4.7.). It had managed incrementally to construct a large house with CI sheet roof and RC posts. The wall on one side was built of CI sheet and all the other walls were of cheaper and less durable materials such as bamboo, jute stick and salvaged plywood. The household planned to replace these materials gradually with CI sheet and thus over time acquire a house desirable in terms of status and relative durability. Other examples of incremental construction were in households that had stable incomes or had secured institutional loans - not housing loans but general loans, discussed in Chapter 4, Section 4.3.2. For a household having access and the ability to repay small periodic institutional loans at lower interest than village moneylenders, such loans allows it incremental house upgrading, according to

its needs and financial condition. Jahanara Khatun's (HH 25) household obtained some materials from a dismantled post-disaster 'relief' house it had received, sold a cow, and acquired a Grameen Bank general loan of Tk 5000 to build a large house with CI sheet roof. After repaying this loan, the household planned to take another small loan and in this manner expected gradually to possess a house with RC posts and CI sheet roof and walls.

Fig. 5.13. Lota Bala's (HH 28) and Jahanara Khatun's (HH 25) houses (a and b respectively), in a transitional stage of incremental upgrading



In contrast, Sharmila Begum's (HH 10) household, living without legal permit on an embankment, had to rebuild its thatch and rushes house every year, in addition to frequent relocation due to eviction by the authorities. Observed during fieldwork, when the time arrived to renew house materials, the household had no funds. Thus Sharmila and her family with three small children were compelled to reside in a dilapidated house in a state of serious disrepair for more than three months before she managed to obtain a loan from her brother. Soon the time would arrive to rebuild the house again, and if the loan is not repaid by that time, the predicament of her household is unimaginable. Jamal Alam (HH 15) said that Tk 2500-3000 was required every year to rebuild his house; for the most recent renewal he obtained a loan of Tk 2500

Fig. 5.14. Mofizul Haq's (HH 31) house, built entirely of natural materials, requires regular repair and rebuilding

from his uncle on very lenient terms. It is foreseeable that he might be able to seek such loans in the future, due to the patronage of his wealthier uncle, but how far such a mode could continue is uncertain. For Mofizul Haq (HH 31), there was no option but to seek a moneylender's loan; he was frantically attempting to repay the loan by starving his family, because the imminent prospect of rebuilding was looming.

The concept of self-built incremental house building may appear appealing in contrast to one-off, institutionally managed housing projects without owner involvement. But to appreciate the inherent appeal of self-built incremental housing, some of the conditions necessary for it to be feasible should be understood. Exclusion from partaking in a process of consolidation by incremental building by very poor households, living on land with insecure tenure, forced to begin a fresh pursuit annually for funds and other resources, often with meagre success, is relatively undocumented. Understanding the implementational and coping strategies of such households should be the starting point for agencies interested in extending benefits to them.

5.4.1.3. Division of labour: aspect of social structure

The notion, especially among those outside rural communities, that self-built housing is generally built by household members, is widespread. The researcher encountered this idea in various fora in urban Bangladesh and also in other countries. Chowdhury's (1992, p. 55) observation - 'Most homes are built [in rural Bangladesh] with family labour unless the family is wealthy enough to be able to afford hired help' - is a clear example. Although this statement might be true in some cases, there was almost no example of this practice in the sample of this research, even among the poorest households. All but two examples (HHs 19 and 28; explained below) of self-built housing had employed hired labour. Most households generally do not possess all the necessary skills to construct even the most basic form of house; there is almost always reliance on community members specialised in construction work, even if to a minimal extent. The household might participate extensively, but some domains have to depend on external help; roof construction is typically such a domain. It is indeed in the self-interest of low-income households to minimise hired labour, but several reasons prohibit adoption of this practice completely. For a daily subsistence worker, taking time off from work to attend to house construction means loss of income; only if financial savings achieved by personal involvement outweigh loss of potential daily income, it could be considered a feasible option. Even for supervision, there is often reliance on household members who are home-centred, such as women. For men there is the imperative to generate income from beyond the homestead, presenting obstacles to devoting time to house construction. Only during some of the crucial stages of construction might it become necessary for men to take part. Quite often, even if a man can afford the time, or is unemployed (sometimes during the post-harvest slack agricultural season), he might not possess the skills to contribute to house construction. For example, even though Jamal Alam (HH 15) took time off from his work to assist the construction workers, he had hardly any construction skills; his role was restricted mainly to simple menial tasks and supervision. When asked about his lack of construction skills, he replied:

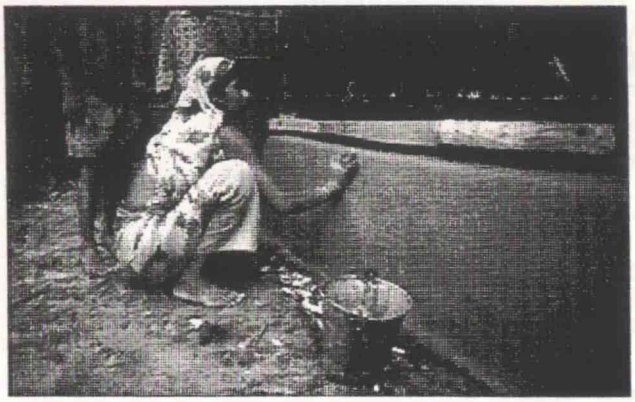
> I grew up in a poor family and right from childhood I had to work in the fields. Later I learnt how to drive a rickshaw, but I didn't have much chance of learning any other skills. I was always too busy earning a livelihood.

This explains one of the basic reasons for the specialisation and division of labour evident in rural areas. The exigencies of survival imposed by a subsistence-based economy often set limitations on an individual's acquiring a wide range of skills. In an individual's best self-interest in such a context, it is prudent to adopt a singular strategy in skills development; it is better to do one thing well than to do many things with lesser competence, to maximise one's competitive edge in a highly competitive labour market.

Only under very specific circumstances is it possible for a household to rely entirely on family labour. If a household belongs to a large extended family, there is a greater possibility of recruiting labour from among kin. Or if a household includes members that are themselves construction workers, then it is might be unnecessary to employ external labour. Koruna Rani Shutradhar's (HH 19) household illustrates this point. It shared a homestead with the individual households of seven of Koruna's brothers-in-law and her parents-in-law. Her husband, as well as all his brothers, were *mistris*; as this was a Hindu family, their occupation was, to a large extent, caste-based. All the brothers assisted each other in building their houses. In addition, they had access to their own teams of *kamlas*. However, even in this case, a degree of specialisation was evident. Koruna's next door brother-in-law, Naresh Babu Shutradhar, was upgrading his house by using RC posts. To fabricate the posts, he had to employ a *raj-mistri* (mason); it was beyond the skills of his extended household. There are exceptions, such as Lota Bala's (HH 28) household, which built its house with CI sheet roof and RC posts single-handedly. However, this was an untypical household (see Vignette 4.7.) and Lota's *mistri* husband was somewhat of an all-rounder construction worker.

During fieldwork it was observed that even within the household there is a division of labour based on gender roles. Main design and site planning decisions are usually taken by male members of the household (quite often the male household head) in consultation with construction workers. According to Bhorosha Bala (HH 5): 'Women don't have much idea about such things.' The female input into design decisions is commonly limited to the layout of their domain, the kitchen. During construction, the female's task is restricted to fetching soil, water, etc and assisting in menial chores such as lifting and carrying. Yet although a woman's role is constrained during construction, generally considered a male domain, her role expands during post-construction maintenance. It is generally a female responsibility to maintain the house's earthen plinth by

Fig. 5.15. Maintaining the house, especially the earthen plinth, is the duty of the household women



regularly re-plastering it; in earth houses, women attend to its upkeep by periodic plastering with mud slurry. A study by Chowdhury (1992, p. 55) in north-western Bangladesh shows a gendered division of labour in construction of earth houses, where the role played by women is subservient. White (1992, p. 121) has classified male and female activities as 'primary' and 'secondary' respectively, typified by these common divisions of labour: '... men grow the rice, women process it; men build the houses, women maintain them; men purchase food, women cook it'.

Several inferences can be drawn from this. Firstly, women's labour is generally de-valued; during house construction they are compelled to participate by sheer virtue of their home-centred existence without any material exchange value attached to it. Hired construction workers are generally without exception men, who thus participate in the cash economy, as do household members (usually male) who generally work outside the home to generate income. Secondly, after construction, de-valuation of women's labour persists through their continual involvement in maintenance outside the parameter of the cash economy. However, the structural conditions that prompt this phenomenon have to be taken into consideration. Within the traditional patriarchal hierarchy, running the household is often a joint project; in addition to divided roles and domains of involvement, the economic profile of a household is a composite product of male 'outside' exchange income and female 'within homestead' non-exchange labour ['exchange income' is defined as 'wage income determined predominantly through the market mechanism' (Alauddin *et al* 1995, p. 244); in that sense, female labour, without direct participation in the market, can be classified as 'non-exchange].

It is possible that structural changes such as increased employment opportunities for women outside the home may allow a re-shuffling of roles. How much such a change of an essentially economic nature may bear upon other structural aspects such as male disinclination towards home-centred work, equity at workplace and stigma attached to loss of dignity associated with loss of *purdah*, remains open to question. There is also the possibility that such a change may render women doubly encumbered with both household and outside work, often a situation prevalent in other societies with more outside employment of women.

5.4.1.4. Other labour issues: 'attending to the hunger of the stomach'

There are some advantages in self-built over agency-built housing, especially for the household. Firstly, the type of house built is locally replicable, its construction technology (if affordable) accessible and amenable to local construction skills. Secondly, it allows the household to exert considerable (if not always complete) control over implementation, taking into account household needs and preferences, usually through consultation between the household and construction workers. Finally, though there might be a tendency for individuals to innovate and to be guided by external influences, self-built housing (especially that of low-income households) generally responds to current local ethos and collective social values. It is seldom a source of conflict within the community.

There are, nonetheless, several problematic issues within this apparent paradigm of relative harmony. The expansion of institutional relationships has made it possible (albeit to a limited extent) to acquire funds for house construction, but this has attendant drawbacks during implementation. Availability of funds raises aspirations such as the desire to build with CI sheet; despite its increasing availability in many rural areas, there are still many remote villages without local supply. Thus when both the Bhorosha Balas (HHs 3 and 5) availed themselves of Grameen Bank (GB) loans for self-built houses, they had to procure CI sheet from the nearest towns about 20 kms away. For one of them (HH 3) it was easier, as she was better off economically and had relatives owning rickshaw vans who provided transport service at a discount rate. Such social networks are crucial in accomplishing household aspirations, but are often linked to the economic profile of a household. In the other Bhorosha's (HH 5) household which was poorer, the husband, Sudhir Chandra Ray, was himself a rickshaw van driver, and in the absence of any other suitable alternative and social network, he had to travel the long distance with his rickshaw van to purchase CI sheet. Rickshaw vans are generally used for smaller distances, and to pedal such a distance within a day and carry the load was indeed physically exhausting for Sudhir. In addition, he lost most of his income on that day; although he managed to collect some passengers on the outward journey, he had to return alone with the load, spending the entire day on the task.

Shaheda Khatun (HH 36) commented: 'There's too much corruption in contractor-built projects, it's better to arrange workers on your own and build according to your own preferences.' Nonetheless, such an arrangement, she also pointed out, has its own scope for corruption. Labour payment is generally conducted on a daily basis in self-built construction. This implies that the slower a worker works, the longer the construction time-span, and hence a longer period of employment. It is to the worker's advantage to complete as little work as possible and to be paid at the end of the day. Several households reported slackness among daily-waged workers and the tendency to delay work by working slowly, colloquially termed as '*dhilami*'. To keep this tendency in check, surveillance by household members becomes necessary; as Mofizul Haq (HH 31) said: 'If we were not around, they [workers] wouldn't have worked at all and at the end of the day would have demanded payment.'

Vignette 5.4. A life of misfortune

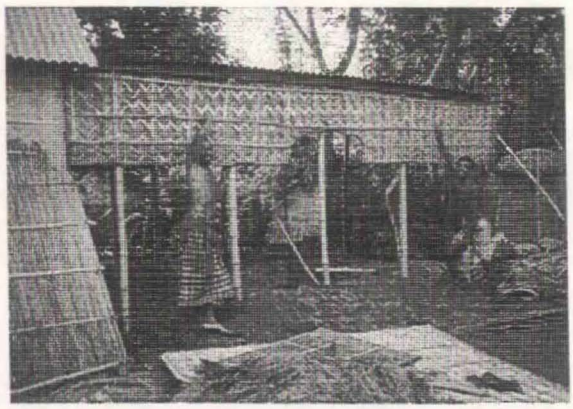
'We never owned land, but we had a large CI sheet house before. It was quite expensive to build; it was worth Tk 35000', said Sajeda Begum. That was when her household lived near the coast in Cox's Bazar. After losing the house in the 1991 cyclone, the household decided to move inland in fear of future cyclones. Like many other households, it decided to settle in the nearby hills. There was less demand for land there, and it was still possible to settle without a legal permit.

Sajeda's husband and two sons were fishermen, so it would not have been practical for them to migrate very far inland. They had no other skills: how would they earn money? The men often went away for days on fishing expeditions in the Bay of Bengal with its rough waters and strong winds. Misfortune was always lurking around the corner, and it struck one day, taking away Sajeda's husband and one son. Sajeda waited for days for them to return and eventually had to resign herself to her fate. She had only one son left, who now became the main breadwinner. He did manage to earn well during the fishing season, but had to spend extended periods out at sea. Without a male member at home most of the time, Sajeda had to manage somehow on her own. She did not mind that; her main worry was for her son, whom she did not want also to lose.

Quite often because of the relatively subordinate position of women, it is necessary for the male head of household to remain vigilant, often neglecting his own outside work, thereby affecting his income and employment. If he himself is a daily labourer, then this results in a chain-reaction: to control *dhilami* of his hired workers, he himself adopts the strategy of *dhilami* at his workplace.

There is the possibility of arranging construction labour on contract for a lump-sum fee, but this is often prohibitive for households because of the large one-off downpayment involved; smaller sums of daily payment are generally perceived as less exacting, and for subsistence households such a mode is more affordable. In addition, the requirement of partial downpayment prior to commencement of construction implies uncertain poor delivery of service and, at the extreme, risk of absconding. An example of an informal building contract within the sample of this research is Sajeda Begum's (HH 38) household. For her this was a necessary option, as she was in a specifically vulnerable position. She lost both her husband and son and had only one remaining son, who spent extended fishing periods out at sea. In the absence of a male household member, it would have been difficult, if not impossible, to maintain control over the workers, hence the decision for construction on contract. Except for such cases, generally, despite the inherent scope for corruption and associated problems, most households perceive the daily-waged labour system as more advantageous.

Fig. 5.16. Alaya Khatun's (HH 7) husband working as a paid *kamla* for building a neighbour's house



There are other effects of the penetration of the cash economy into a formerly traditional system of transactions in kind. According to narratives of several senior members of the community, in the past, after completion of house construction, it was common to rely on workers who built the house to carry out small repairs and general maintenance without fees; a small meal instead of a cash transaction generally sufficed and maintained goodwill among both parties. If a part of the house became damaged in a storm, local construction workers, even those who did not build that house, would lend a hand in repairing it. But this has gradually become rather uncommon. Even for small repairs, construction workers charge fees and are reluctant to assume responsibility for upkeep of houses built by them. As Bhorosha Bala (HH 5) said:

> There are always small problems with this type of house [built of natural materials], and we often need to call them [construction workers]. For every small repair they charge money, even though they are our relatives. When we don't have any cash, we can't think of calling them and we try to do what we can on our own.

In fact, sometimes construction workers blame the household for deterioration of the house, to expunge any responsibility on their part for the quality of construction. The concept of customer

liability is generally lacking. Households which have built a house with a loan, and are desperately attempting to keep up with repayment, do not often have funds for maintenance. Lacking the necessary construction skills, the household is compelled to live in a house in disrepair. Most households attempt to carry out makeshift repairs on their own and unless the need is urgent, do not seek the service of construction workers.

Yet it must be accepted that most construction workers themselves belong to low-income households and their attitude is understandable. Their imperative to participate in the market is a survival strategy and part of the general transition to a cash economy to which all individuals within the community respond in their own ways. Jamal Alam (HH 15) summarised this point simply: 'Everybody has to attend to the hunger of their own stomachs.'

5.4.2. Partly self-built

Some rural housing programmes funded by agencies such as the Grameen Bank (GB) attempt to support self-help housing by the provision of loans (Chapter 4, Section 4.3.1.). Combined with this housing loan is usually the stipulation to use certain building components, some of which are supplied by or acquired in connection with the agency. Other building materials and components are procured by the beneficiary household and the house is built by the household, with or without supervision by the agency. The agency often specifies certain design guidelines. This method of implementation is categorised here as partly self-built; although it shares many of the characteristics of completely self-built housing, unlike many of the examples of the latter, it is not independent of an agency. The obligation on the household to conform to some specific institutional standards emanating from the agency's ideal of a house is the diffentiating trait of this implementation mode. Two housing programmes were found to follow this method; the following sections chiefly present comparative findings and an analysis of these programmes.

5.4.2.1. Acquisition of 'do-it-yourself' kits

Two programmes studied in this research were implemented in the partly self-built mode: the Grameen Bank's (GB) (ongoing) and Proshika's (now discontinued). In spite of some differences in approach, both programmes stipulated the use of RC posts and CI sheet roofing. The GB has its own production units, often in towns, for fabricating RC components such as posts and sanitary latrines, supplied to and stored in 'spots' in villages from where they are made available to beneficiaries. CI sheet is purchased from the market, usually under the supervision of GB staff, from suppliers with whom prior arrangements have been made by the GB. Proshika had a revolving loan fund (RLF) scheme for supporting rural building component manufacturers/ entrepreneurs, from whom beneficiaries were obligated to purchase RC posts; the entrepreneurs could also conduct business with non-beneficiary customers to service their loans from Proshika, as well as to earn a livelihood. The GB does not do this; components are manufactured solely for GB beneficiaries. In addition to an approach similar to the GB's for providing CI sheet, Proshika often bought supply in bulk to distribute to beneficiaries. Due to the economy of scale of purchase, it was possible for Proshika to provide good quality CI sheet at a lower price. As pointed out in

Chapter 4, Proshika's housing loan programme was discontinued mainly because of very low repayment. It is not clear how much this was connected to the implementational method; therefore the characteristics of its implementation are discussed here without an attempt to make linkages with the issue of loan default.

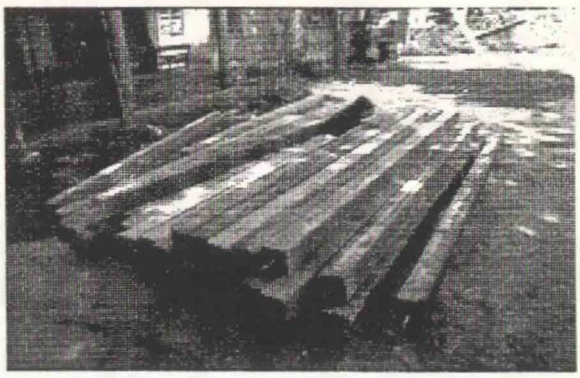
Table 5.4. Comparison of component provision by the Grameen Bank and Proshika

	Grameen Bank	Proshika
RC posts	Manufactured in own production units	Manufactured by rural entrepreneurs supported by credit
	Transported from production units to village 'spots' for supply access	Direct access to supply
	Solely for GB beneficiaries	For Proshika beneficiaries and any other interested customer
CI sheet	Bought under supervision of GB staff	Bought in bulk by Proshika and then supplied to beneficiaries
	Prior arrangement of GB with suppliers to ensure quality	Bulk purchase ensures quality at lower cost

If these two programmes are compared in terms of provision of components, Proshika's approach to production of RC posts appears more flexible and it catered to a wider market. It provided scope for small-scale rural entrepreneurs to generate incomes, and to choose customers. It was observed during fieldwork that entrepreneurs (no longer for RC post, but for MCR tile and treated bamboo) are accountable to Proshika field staff, often trained in construction, thereby maintaining quality. However, due to limitation on the number that could be supported, there tended to be a few entrepreneurs catering to a relatively large area; they often were established in areas with a relatively good infrastructure and generally not in remote areas. Villagers in remote areas found it difficult to access the sources of supply and often the transport cost was prohibitive. When Lokman Mia (HH 18) built his house, he managed to economise somewhat on transport cost (and derived mutual support on associated matters such as carrying, lifting, etc) by sharing with three other Proshika beneficiaries building at the same time in his village; transporting alone might have presented formidable problems. Because of this, for an individual non-beneficiary rural customer with a distant construction site, purchasing such components might have proven impractical.

On the other hand, the centralised production of the GB, catering to a limited clientele, although enhancing rural employment by the creation of jobs at production units, is somewhat limited in its scope for income generation. Nevertheless, production in units in areas with infrastructure facilities and then transporting components in bulk to be stored in village 'spots' (often a GB branch office) minimises transport costs for beneficiaries and allows easier access for those in

Fig. 5.17. RC posts stacked in open space in front of a GB branch office



somewhat remote areas. Storage facilities at these 'spots' are sometimes rather inadequate: in front of one branch office RC posts were seen stacked in the open space. The protruding steel rod at the tip of posts for attachment to the wall plate had rusted badly and corroded due to exposure to the weather. The damp climate also facilitates growth of algae on the posts, reducing their attractiveness to prospective beneficiaries. This is a minor problem, easily rectified; recognition of the problem is important, but seems lacking.

5.4.2.2. Disbursal of loans: controlled autonomous house-building

Both the above programmes provided loans from which the costs of components were deducted during loan disbursal. Through this process the programmes ensured quality control at standardised prices. In the GB programme, the housing loans are disbursed in two to three instalments to allow supervision of procurement of the components and to control against utilisation of the money for other purposes. However, this extended bureaucratic process presents beneficiaries with difficulties. Tushar Bala (HH 1) and Proshad Chandra Ray (HH 2), both expressed their resentment at the tediousness of the process. As Proshad said:

> The loan disbursals were not prompt at all and I had to pursue them by visiting the GB office many times. Sometimes I had to sit there for long hours and wait for the officers to finish their other businesses. I am a daily labourer and on each of those days I lost my income.

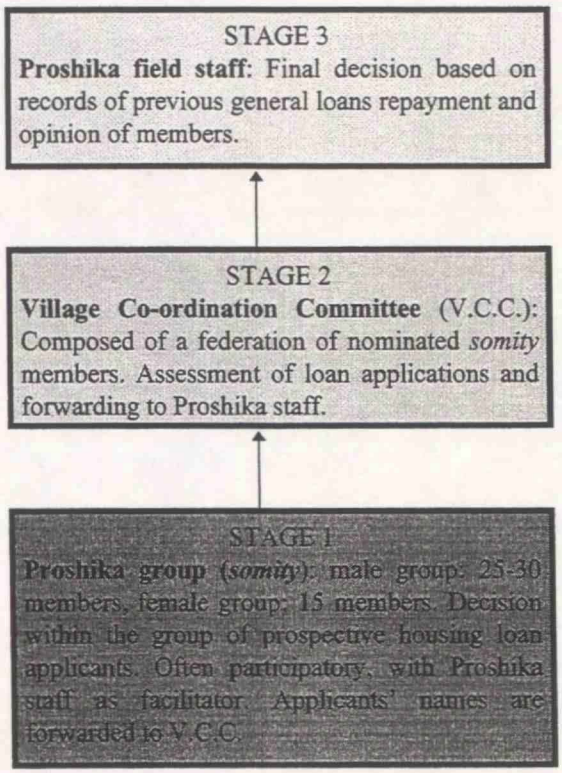
Sometimes processing housing loans takes more than a month, often a source of aggravation for beneficiaries. In the case of Proshika, the process was even more protracted: sometimes it took nearly three months. A Proshika staff member expressed both his understanding of the difficulties of beneficiaries and his helpnessness:

> I know beneficiaries often face problems in existing dwellings; some of them live in ramshackle dwellings, commonly the reason for which they apply for a housing loan. But what can we do? It does take time to process the loans, there are so many necessary formalities involved.

Ironically, the delay often arose from Proshika's commitment to a 'bottom-up' process of beneficiary selection (see Fig. 5.17. below). Village groups of Proshika members (known as *somity*) usually decided among themselves prospective housing beneficiaries and forwarded their names to a co-ordinating body or village federation, the Village Co-ordination Committee (VCC), composed of nominated members of the *somity*. After assessment, the VCC then proposed the names to Proshika field staff, who gave the final decision, based on their records and opinions of the members. Proshika *somity* meetings were generally held monthly, although as Lokman Mia (HH 18) narrated, they tended to be rather irregular and members were sometimes absent. In addition, Proshika disbursed loans according to its own quarterly working periods, and if an applicant was fortunate, his/her application might coincide with the period in a way that facilitated prompt disbursal, but in the event of narrowly missing a decision point, applications had to wait for nearly three months. Thus, paradoxically, the intention of promoting a 'bottom-up' self-selection process, supposedly beneficial to Proshika members, might on the contrary have

presented them with difficulties. Official attempts of streamlining, such as by these quarterly disbursals, further augmented these difficulties. As a Proshika field staff member commented: 'We seem to have dug our own trap.'

Fig. 5.18. 'Bottom-up' selection process of Proshika housing beneficiaries



In the case of the GB, loan applicants are also chosen to some extent from within the membership group, but there are several specific features. Firstly, the GB regulation that a borrower has to have a track record of good repayment of two previous general loans before a housing loan is provided is in itself a decisive factor. Secondly, the smaller size of groups (five to eight members) compared to those of Proshika allows for easier negotiation between the members and co-ordination by the bank staff. Thirdly, loans can be disbursed at any time considered suitable by bank staff, and generally do not pertain to any specific disbursal timetable. Finally, weekly meetings instead of monthly ones contribute to prompter review of applications. Nevertheless, the GB has its own procedural delays (identified above), albeit to a lesser extent than Proshika. In spite of the attempt to promote a 'bottom-up' process (the GB supposedly delivers banking at the 'doorstep' of the borrower), the GB loan criteria and the pervasive role of bank staff in decisions about loan applications to a large extent seems to negate the attempt.

5.4.2.3. Technical supervision: who does it?

According to a GB field staff member, there is more freedom in design and choice of materials in this method of implementation than in agency-built projects. In spite of regulations regarding size of house (a GB house is not allowed to be less than 20 sqm) and use of some specific components, the choice of materials for walls is mainly decided by beneficiaries. A variety of regional wall

building techniques is evident in GB houses, and indeed, as GB staff asserted, GB houses are less standardised and more personalised than in many agency-built projects.

Despite these qualitative advantages of partly self-built housing, an earlier evaluation pointed to the need for more technical supervision in GB houses (Islam *et al* 1989, p. 33). Beneficiaries are often not able to build appropriately with RC posts, generally a non-traditional technology. The bank staff are generally untrained in construction and their supervision is limited mainly to ensuring procurement and utilisation of stipulated components. The evaluation also highlights other issues: GB staff are unwilling to intervene too intensively, believing it would restrict beneficiary choice; they fear that it might also result in conflict. Additionally, staff are not appropriately qualified for construction supervision, reinforcing their only limited involvement (Islam *et al* 1989, pp. 19-20). On the other hand, Proshika at its field offices employed qualified technical staff who were completely involved in different stages of implementation. Quite often, several Proshika beneficiaries built houses at the same time, and the technical staff's input proved useful during that time. The staff also supervise construction of other buildings such as Proshika training centres, schools and field offices and they have a variety of other roles, including supervision of component production centres, motivating villagers to adopt new technologies, post-construction support in dealing with problems that might arise, and even non-technical tasks such as collecting loan instalments from beneficiaries. In addition to being conversant with all aspects of construction of rural buildings, the staff necessarily have to be flexible in terms of duties and willingness to adapt to rural life.

Notwithstanding their greater involvement, during in-depth informal discussion the following feelings were expressed by a Proshika field engineer:

> You know, I have worked on large construction projects of concrete high-rise buildings before I joined this job. I have a lot of experience ... This is a well-paying job and quite secure, which is why I joined it. But now it seems that I can hardly use my skills; these [Proshika housing and other buildings] are very small buildings and there is not much for me to do. I don't think I should waste too much time here; I should look for other opportunities and move on to large urban projects again.

Box 5.9. Important aspects of career choice in Bangladesh
(Excerpted from Ahmed 1997, pp. 91-92)

It was evident in a workshop at the Bangladesh University of Engineering and Technology (BUET, the most prestigious institution in Bangladesh for technical education) that most Bangladeshi academics/professionals are interested in careers catering primarily to the wealthy section of society. Such careers are expected to promote self-advancement in terms of material benefits and status. Additionally, images of glamour emanating from lifestyles in industrialised countries further serves to steer towards such career choices. A career in the field of low-income housing does not promise such advancement; it is generally believed that it entails sacrifice and minimal monetary gain, less attractive within the hard-pressed economic conditions of a developing country such as Bangladesh. As encapsulated succintly by a senior academic at BUET: 'They [young academics/professionals] do not find such work [low-income housing] attractive. They are more interested in computer-aided design, high-rise buildings, etc'.

This prompts an important observation: qualified technical staff seldom find such work challenging, especially in the context of the allure of an expanding urban large-scale construction sector. On the other hand, non-technical staff who seek jobs in the NGO sector, such as the GB staff, are rarely trained in construction and have very different skills. There appears to be a niche for a special type of professional, for whom both training and opportunities are generally lacking. Some have termed such a professional as a 'para-architect' (Chisholm 1979, p. 124) or a 'barefoot architect' (Anzorena 1993). In spite of nearly two decades since such terms were coined, except for a few isolated examples, emergence of such a professional is yet to be witnessed, although especially needed in Bangladesh. There is hardly any training or opportunities available for such professionals, and the bulk of developmental work, in housing and other fields, is undertaken by a cadre of non-technical staff, drawn from the ranks of eager well-educated job-seekers in the general context of employment scarcity. The limited number of places in technical education, for which there is intense competition, produces individuals with skills which are much in demand, and these people are usually offered better employment. Deployment in remote rural areas usually leads to a life of hardship, away from urban opportunities; this appears neither glamourous nor fulfilling for such individuals.

In addition to the problem of attracting suitably qualified technical staff, the inherent characteristics of household participation in partly self-built housing often results in another problem. Many households prefer to undertake construction work on their own, employing workers over whom they have control, and in general believe themselves capable of managing their own house construction; using components from agencies is viewed as an unavoidable and necessary part of obtaining loans, and for households this is the boundary of institutional intervention beyond which they prefer to control construction work. Thus construction supervision by agency staff, especially when unsolicited by the household, leads to resentment and a feeling of being patronised. Even in the minimal supervision of the GB projects, such sentiments are evident, as expressed by Tushar Bala (HH 1):

> We didn't ask them [GB staff], they themselves gave advice and suggestions on construction. As if we don't know how to build! Even I know how to build mud walls. What could we do? We had to listen to them because they gave us the loan.

Some GB staff, especially those with extensive field experience, are aware of this problem and experience difficulty in maintaining a balance between the institutional requirement of providing supervision and respect of household autonomy. There is also an ingrained peril, as a GB staff member pointed out:

> It's better if they [beneficiaries] build mostly on their own. If we get too involved, then afterwards they can blame us for faulty construction or other such problems.

However, problems can also arise from lack of supervisory involvement. In the same project in which the GB staff member just quoted was involved, when a beneficiary Moinu Mia (HH 9) was asked about supervision by staff, he said:

> They were not very interested about construction after giving the loan and supplying the components. They hardly ever visited! They regularly visit the weekly meeting house (*kendra*) in front of this settlement to collect loan instalments, but seldom come into the settlement to see the condition of the houses. They came once for a brief visit after completion of construction and in the last four years have entered the settlement only three or four times. They are only interested in money and loan repayment, not in the quality of construction.

It is suggested that many of these problems are related to the general class difference between agency staff and low-income rural households. In spite of many efforts by agency field staff to bridge the gap by living in rural areas and immersing themselves in grassroots activities, the fact that staff are generally educated professionals working in salaried positions, whereas many low-income households are composed of non-literate individuals employed in menial or low-status work is evident from dress and manner; it can be asserted readily that no male agency staff (most GB field staff are men) would generally be seen with a *lungi* in public, but such attire is quite common for many low-income men. In completely self-built housing, supervision by specialists is expected and is usually part of a financial arrangement between the household and specialist, through which the household can maintain control. With agency-supported self-built housing, such an arrangement and possibility of control is lacking, and interaction is on a completely different premise. For the staff, supervision is an obligatory job requirement, for which they are accountable principally to their agency and not to the beneficiaries; for the beneficiaries, staff belong to an upper social class, generally to be shown respect and deference; supervision by them can thus appear inappropriate, and the lack of it, neglect or rejection.

5.4.2.4. Construction: 'we can do it, we just need the money'

In both GB and Proshika programmes, after the agencies made RC posts and CI sheet available, it was the beneficiaries' responsibility to transport them to construction sites, arrange labour and other building materials, and to build houses in a manner similar to the self-help mode described in Section 5.4.1. Many of the issues relating to the construction process are similar: availability of natural building materials, terms and division of labour, incremental extensions, etc, and are not discussed further here. A point of difference to note is the problem frequently faced by households in transporting, carrying and installing RC posts, a relatively heavy component for the typical non-motorised rural vehicles on unpaved roads or waterways. Although an aspect pertinent to implementation, it is discussed in detail in relation to building design in Chapter 6, Section 6.4.1.1. on RC posts. It is discussed there because it is considered an intrinsic aspect of the technology.

One of the strengths of partly self-built implementation is local replicability. In many rural areas, as already noted, especially those near to or with links to urban centres, manufactured materials such as cement, steel rods and CI sheet are generally available, as are local skills of building with

CI sheet, a material used in most such rural areas (albeit mostly in houses of the relatively affluent) over the past few decades. As Naz Jahan (HH 8) pointed out:

> Of course we can build a tin [CI sheet] house on our own! We don't need the GB to help us buy tin sheet. We had a tin house before we lost our property in riverbank erosion. After that we didn't have enough money to build a house, so we took a GB loan.

The use of RC posts is more recent, but in many areas they have become quite common, accompanied by the rise of burgeoning informal sector production. The technology requires no motorised machinery, relying on simple tools and skills. While in some rural areas a readily accessible and dependable supply of manufactured materials is sometimes lacking, even in them are local skills in building with CI sheet and fabricating RC posts. This was the case in the area where Proshad Chandra Ray (HH 2) lived. As he said:

> People here can build with these components if they are made available. Local workers built our house after we got the components from the GB. Cement pillars [RC posts] can also be made here; they are not hard to make. The only problem is getting the materials and the money to buy them. You would have to get them from the towns, which are quite far. But people who can afford to, buy them from there, especially tin [CI sheet]; you can see that there are quite a few tin-roofed buildings here.

Thus the problem with these components is not their replicability, and to some extent, not even the local availability of materials, but their cost, prohibitively higher than most local, natural alternatives, at least in the short term. For some households with the ability to repay loans, but not well-off enough to afford such components with personal funds, institutional loans for partly self-built housing is a viable and desirable alternative. Proshad Chandra Ray's (HH 2) inability to repay his loan is the reverse side of the coin (see Chapter 4, Section 4.3.1.).

Moinu Mia (HH 9) raised an important issue:

> We had to use the GB cement pillars [RC posts] because we took a loan from them. If we could use the money on our own, we could have got better pillars made at lower cost. A lot of people in this area make them on their own.

In Moinu's area, close to Dhaka, there is indeed flourishing use of RC posts, and an informal sector selling pre-fabricated posts or fabricating *in-situ* posts on order. Households who can afford them use them extensively. Such informally produced posts appear similar, but are often less expensive than those supplied by the GB. In Moinu's district, an informally produced RC post costs Tk 260, nearly 40% cheaper than the Tk 425 GB posts. Some GB beneficiaries felt that they had incurred a loss by using the GB posts. However, especially in ready-made informal posts, scrupulous quality control is sometimes lacking; inadequate reinforcement and less cement (and more sand) is used in the concrete mix. Posts might not always be of the high quality that the GB ensures, the reason for manufacturing them in GB production units under strict supervision. Informally produced posts, appearing to be the same quality as GB posts, carry the possibility of

cracking and wearing out within a short time. Households that opt for such posts might believe that they have found a better bargain, only to lose out soon.

Fig. 5.19. Moinu Mia's (HH 9) GB house (a) and Lokman Mia's Proshika house (B)

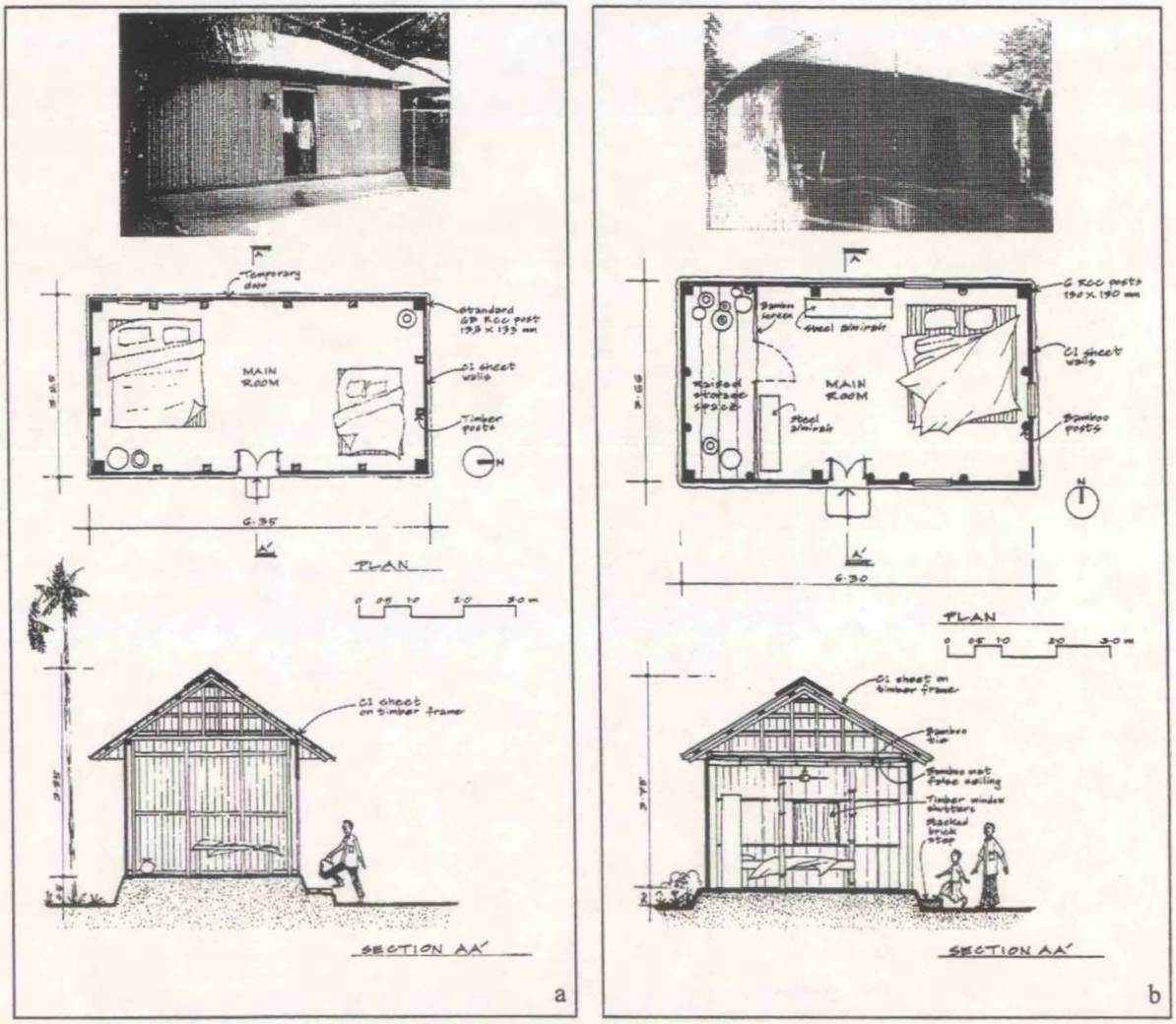
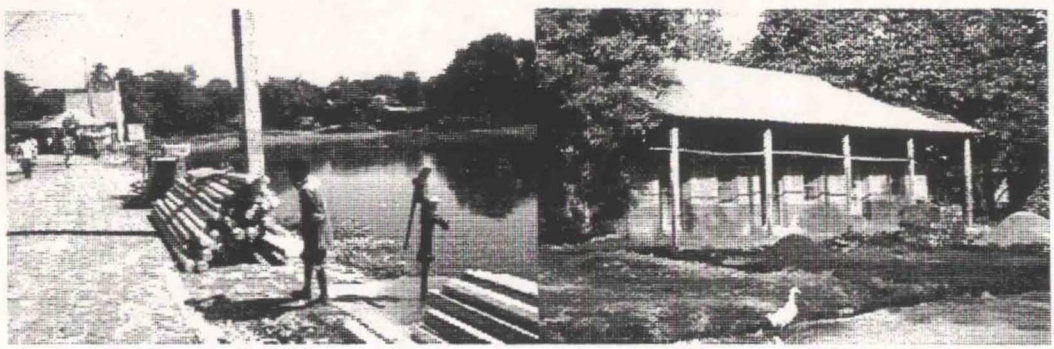


Fig. 5.20. a. Roadside informal sector production of RC posts in Manikganj
b. House with informally produced RC posts



a b

This problem might perhaps be redressed by links with the informal sector, the method adopted by Proshika, not monitoring price strictly, but supervising production frequently. Nevertheless, according to Proshika staff, their entrepreneurs had managed to profit by 7-8% even after selling

their posts at about Tk 250 per post (in the same region where Moinu lived), comparable to the informal sector post, and much cheaper than GB posts - about 30 cms longer than those of Proshika, but this does not justify such a great price difference. Proshika posts did not appear inferior in quality to GB posts; a Proshika beneficiary, Lokman Mia (HH 18), testified to the good quality of Proshika posts:

> I am a mason myself and work on *pucca* construction in towns. I would know if the pillars [RC posts] were not good. I had seen Proshika houses before I built mine and I knew their pillars were good. I am quite satisfied with the materials they supplied us.

It should nevertheless be noted that institutional linkage with the informal sector does not necessarily produce successful results. Many factors are involved, and it would be unwise to suggest it as a general panacea. In the next section, production of a different component - chemically treated bamboo panels - by a Proshika-supported entrepreneur highlights some shortcomings that sometimes arise.

5.4.3. Agency support to entrepreneur

As we have seen, the NGO Proshika has a unique programme of supporting rural building component manufacturers or entrepreneurs. In this section a Proshika programme for supporting entrepreneurs in producing a quite unique component - chemically treated bamboo mat walls - for self-built housing is discussed. These were originally intended for Proshika housing beneficiaries, like the RC posts discussed earlier, and at the same time the entrepreneur was able to generate income by selling the mats to other customers. Because of the dispersed nature of Proshika beneficiaries who used treated bamboo panels, and the preponderance in the Dhamrai study area of villagers, other than Proshika beneficiaries, who used them, households which bought the panels from the entrepreneur on their own and utilised them for self-built housing were studied. In Chapter 6, Section 6.4.2.3. treated panels are further discussed; there the focus is on their characteristics as an innovative construction technology in rural building design. In this section their implementational aspects are considered.

5.4.3.1. Procedural aspects of an innovative concept

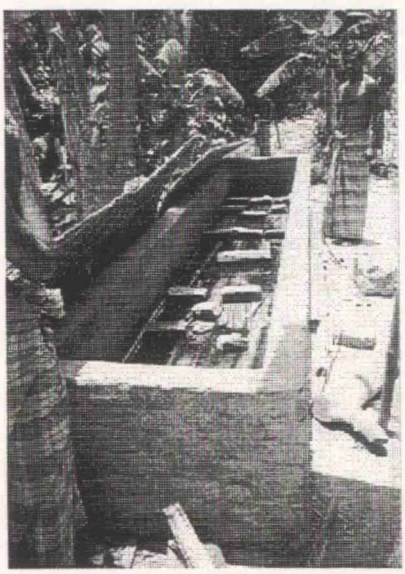
Proshika has two main roles: financial support in the form of credit to the entrepreneur and logistical support. Entrepreneurs are group (*somity*) members of Proshika, provided with credit from a revolving loan fund (RLF), set up specifically for this purpose, to establish a component production workshop (for details of the RLF credit system see Proshika 1994c). This credit attempts to serve a dual purpose: firstly, to generate income and employment in the rural informal sector, and secondly, to be used as a vehicle for disseminating an innovative building component. The first purpose seems to have been achieved to a large degree, but with the second a variety of problems have arisen, discussed here and in Chapter 6.

As this is an unfamiliar technology, it is necessary to provide training to prospective entrepreneurs. A number of instruction booklets in Bengali were produced for use by Proshika

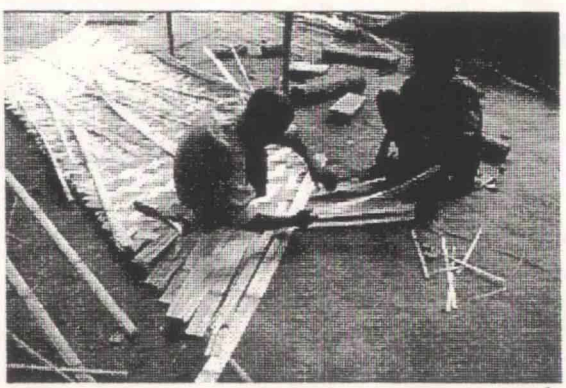
technical staff and trainers, to be interpreted to the often non-literate entrepreneurs. In addition, in the initial stage of establishing and running the production workshops, technical staff provide supervision and advice. In the production centre studied during fieldwork, it was observed that, two years after establishment, it was operating with hardly any supervision by Proshika, and sufficient demand has been generated in the area for the entrepreneur to be financially self-sustaining and able to maintain regular loan repayments. As Abdul Hashem, the entrepreneur, said:

> This workshop has provided me a stable source of income. Before, I was often unemployed and worked seasonally in construction work. Sometimes I had to travel long distances to seek work. Now I can live in my village, work here and earn money.

Fig. 5.21. **a. Open tank for soaking bamboo in chemicals with bare hands, covered sometimes only with bamboo mats**
b. Weaving treated bamboo with bare hands



a



b

In spite of this self-reliance, a particular problem was noted. During training, specific instructions were provided to protect hands from toxic damage when immersing bamboo strips in the chemical solution; in the absence of gloves in rural areas, plastic bags covering the hands and tied by rope at the wrists are an easy alternative. However, it was observed that such gloves are not used, even though Hashem is aware of the instructions. On inspection, there was no evidence of damage, but this is perhaps because the workshop had been establised only two years before, and there were several workers other than Hashem who took turns at immersing bamboo; it is likely that the hazard will pose a threat over a longer term. Hashem himself admitted that the acid in the chemical solution causes a burning sensation if there are any sores or cuts on the hand, and the chemical solution if spilled on cloth, especially cotton, spoils it. Further, the toxic quality of the chemicals and their potential for hazard have been documented by various sources (personal interview with staff at the Bangladesh Forest Research Institute, 1996, where extensive research on the technology has been carried out; also see Wells *et al* 1994, p. 49). The reasons for such negligence is unclear, but it can perhaps be attributed to the level of training of the entrepreneur and his team due to a lack of strict instructions by trainers. There is thus a greater need for vigilant

supervision by Proshika staff to minimise hazard to human safety. This may appear intrusive and detract from the ideal of self-reliance, but the importance of hand protection cannot be disputed.

Despite this problem, in this study location, there is an advantage for households in using treated bamboo. The entrepreneur is not simply an entrepreneur. He manages all aspects of the workshop, including securing the supply of materials, production and marketing. Typically a customer places an order, and panels of the required size are produced; it is Hashem and his team's duty to transport the panels to the construction site and fit them there according to the requirements of the building design. They often contribute to design decisions. In this sense, Hashem is also a *mistri* with his team of *kamlas*. Because of his local availability, he can also be called upon for repair and maintenance, yet as part of the community, the households can exert a degree of control over him. This pattern corresponds to the typical role of the specialist in self-built housing, with its advantages of village-level accessibility and as part of a familiar ethos.

5.4.3.2. Supply of materials: reliance on external sources

There are two basic ingredients for treated bamboo: bamboo and chemicals. There are two main types of bamboo: thin-walled (generally the *muli* variety) and thick-walled (the local variety in Dhamrai is known as *makla*). *Muli* is a forest bamboo only available in the southern and eastern districts. Bamboo mats are usually woven from *muli* in most parts of Bangladesh, relying on supply often transported over very long distances, although in some cases villagers are compelled to utilise local thick-walled varieties of bamboo, usually less suitable for weaving mats; there are also some thin-walled varieties of bamboo in villages, but very limited in supply. According to Hashem, *muli* is considered better than *makla* for chemical treatment for two reasons: firstly, it is easier to weave, as it can be split into thinner strips; secondly, as strips are thinner, less chemicals are required. Also, unlike *makla*, *muli* does not require to be treated in a green state, an additional advantage. Hashem therefore has to depend on *muli* transported by truck from Chittagong over more than 200 kms. Prior to that, the supply has to be transported from forests by non-motorised vehicles to Chittagong city. In addition to the embodied cost of transport, the bamboo generally increases manyfold in price by the time it reaches its final destination due to several intermediary exchanges between traders/suppliers. However, this is not new or unique to Hashem; this exchange of hands and consequent rise in price is common in the bamboo sub-sector as a whole, a reflection of the increasing scarcity and the consequent longer distances travelled by bamboo supply (Choudhury 1984, pp. 49-50; Johnson and Ritchie 1993, p. 13).

Hashem has to travel to Dhaka to buy chemicals from a hospital pharmacy. This entails a time-consuming journey - two bus rides and a rickshaw ride each way - costing Tk 50-60. Although it appears that Hashem is able to recover this cost and time by sufficient sale of his products, this points to a basic problem. In this area, relatively close to Dhaka, it is possible to obtain a supply of chemicals with some degree of effort. This is uncertain in more remote areas. Even in areas close to other cities (without exception smaller than Dhaka), it is doubtful whether the necessary chemicals are readily available. Thus, because of its requirement of somewhat sophisticated

ingredients, unobtainable and unproduceable in rural areas, the technology faces serious obstacles in dissemination in most rural areas with weak and tedious connections to urban areas. It may require a high degree of institutional input, consequently raising overhead costs of programmes. Unlike cement, CI sheet, etc, also externally supplied, such chemicals generally have no other use in rural areas and hence are not available. The complete reliance on external supply for both basic materials for the technology of bamboo treatment, especially for chemicals, suggests a very limited potential for its wider applicability. Even in the case study area with an established bamboo treatment centre, Rashid Ali (HH 16), a user of treated bamboo, pointed out:

> People know how to weave *bera* [bamboo mats] in this village. There are many construction workers who can build with bamboo and there are merchants other than Hashem who produce untreated *bera*. Some people even weave their own mats and don't need Hashem for that. But, of course, we cannot do chemical treatment. Where would we get the chemicals? Even if we had the chemicals, we won't know how to use them. We would need help for that.

5.4.3.3. Guarantee of product: unresolved issue

The issue of guarantee of long-term performance of this unfamiliar product, treated bamboo, was unresolved. As mentioned, at the time of fieldwork, the workshop had been established for about two years, and it was too early to provide evidence to local villagers of long-term performance. Although earlier experiments by the Bangladesh Forest Research Institute (BFRI) and the government Housing and Building Research Institute (HBRI) demonstrated the effectiveness of chemical treatment in retarding decay of bamboo over a period of fifteen years, in the case study area relevant information contributing to the quality of the product in those experiments, such as strength of chemical solution and quality of chemicals, was difficult to obtain. Without strict supervision by Proshika, the quality of treated mats was open to question.

There were several buildings of treated bamboo which appeared to perform better than untreated bamboo over the short term and served as demonstration in favour of Hashem's treatment. Most users of treated bamboo accepted its improved durability from such examples and also because of trust in Hashem as a member of their community. As Rashid Ali (HH 16) said:

> I know Hashem for a long time and believed him when he said that treated *bera* [bamboo mats] were better. Hence I bought them from him. I was among his first customers, even when many people didn't believe him. Although I had no idea about treated *bera* at that time, I still bought them. If somebody else from outside this village had tried to sell me treated bera at that time, I may not have believed them.

Nevertheless, it should be borne in mind that Rashid's household was relatively secure in economic terms, hence he was in a position to take a risk and provide patronage to members of the community such as Hashem. For less secure households, such as Momota Begum's (HH 17), becoming a risk-taker and early adopter of an untested technology appear less practicable. Hashem generally provides a verbal guarantee of ten years durability (untreated bamboo mats usually do not last longer than five years). However, he indicated reluctance to replace or repair it for free in

the event of decay during this period. Although such problems had not yet occurred, Hashem and his assistant were present during discussion with users when this issue was raised and indicated their response. Not that the users had thought seriously about the issue. In Bangladesh, such long-term guarantee of products is generally uncommon and probably it was not a major concern. In any case, in spite of the trust placed in Hashem at the time of purchase, most users had reservations about the long-term performance of the product, and were generally satisfied as long as it indicated better performance over the short term and the price was only minimally higher than for untreated bamboo. Rashid Ali (HH 16) did not accept treated *bera* as an alternative to manufactured materials such as CI sheet; in spite of the good condition of his treated panels, he was in the process of replacing them incrementally with CI sheet and planning to use them for subsidiary purposes such as internal partitions and false ceiling. This apparent lack of faith possibly also resulted from the lower social status of bamboo compared to materials such as CI sheet. This attitude is reflected in the following statement by Rashid:

> *Bera* [bamboo mats] is *bera*, treated or untreated. It can never last very long. Whatever Hashem says, I am not really convinced. CI sheet is much better, that is why I am using it.

5.4.3.4. Price variability: freedom to quote

The price of untreated bamboo mats in the case study area was Tk 25-30 per 0.6 sqm (local anthropometric measurement of 1 *hath* = about 40 cms, where 1 *hath* x 4 *hath*, approximating 0.6 sqm, is used as a standard measurement for bamboo mats). According to staff members, Proshika has recommended that treated mats should not be sold at more than Tk 35-40 per 0.6 sqm, representing an increased cost of about 40%. Initially, for early users such as Rashid Ali (HH 16), this recommended price was used - acceptable to him, in view of the savings he made in maintenance costs, even over the short term. However, during the field visit it was found that Hashem was charging a much higher rate, up to Tk 50-60 per 0.6 sqm, a price increase of about 100% over untreated mats. This is almost comparable to the cost of CI sheet, a more durable and more socially desirable building material (see Table 5.5.). The entrepreneur is unaccountable to

Vignette 5.5. The manipulative enterpreneur

At the beginning of fieldwork in this case study area, it was difficult for the researcher to disassociate himself from Proshika field staff, who insisted on accompanying him everywhere. Thus when inquiring about prices from Hashem, the treated-bamboo entrepreneur, he quoted the Proshika recommended rate of Tk 40/0.6 sqm in front of Proshika staff.

A few days later, after a long hot day's fieldwork, the research team was sipping sweetened tea in a tea-shop next to Hashem's workshop; Hashem decided to join them and a conversation about treated bamboo ensued. Two men from outside the village were also sitting in the shop, and they began to pick up snatches of the conversation. Gradually becoming interested, they approached Hashem and asked him if jute sticks could also be treated, because they were interested in building their houses with treated jute stick panels. Being answered in the affirmative, they asked for a price quotation. There was a Proshika field staff member present who had volunteered to work in the research team, and Hashem, after giving him a quick sidelong glance, ventured to quote Tk 50/0.6 sqm for jute-stick; for bamboo, he said, he would have to charge Tk 60. The prospective customers exclaimed, 'Why, that's almost as expensive as CI sheet! It's ridiculous'. The research team was astonished at this new revelation, and for a while, were at a loss for words.

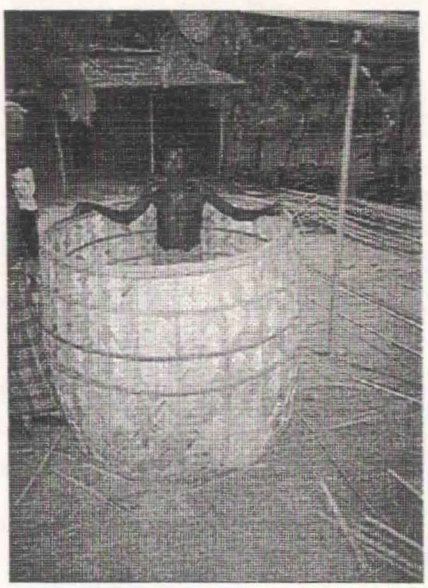
Proshika, perhaps because of the lack of supervision by Proshika staff. Indeed, during the field visit, Proshika staff seemed generally unaware of this issue and when it was revealed, they admonished Hashem. However, such admonition seemed lightly delivered and received, and there was very little indication that future steps to redress this matter would be taken. This was confirmed by a follow-up visit two months later: Hashem was still selling treated mats at the higher rate.

Table 5.5. Price variability of treated bamboo mats versus CI sheet

Type of material	Average price/0.6 sqm (1 *hath* = 0.4m x 1.5m)	Increased percentage
Untreated bamboo mat	Tk 27.5	-
Treated bamboo mat at Proshika recommended price	Tk 37.5	About 40% more than untreated mat
Treated bamboo mat at price sold by entrepreneur	Tk 55	About 100% more than untreated mat
CI sheet (medium quality)	Tk 65	About 20% more than treated mat sold by entrepreneur

Several reasons contributed to this price variability. Firstly, it appeared that there was a great demand for treated mats, not so much for housing as for large grain storage bins, especially after the paddy harvest season. Untreated bamboo bins are prone to insect attack, and the same insects also ravage the grains. It seems that treated bamboo bins repell insects, which thus spare the grains. Proshika had not envisaged such a use; the technology is primarily intended to benefit low-income households by reducing recurrent expenditure in maintaining bamboo walls in the face of scarcity of bamboo and its consequent high price (Proshika 1994a, p. 3). However, it seems that the technology is being pre-empted by well-off farmers who have large quantities of grain to store. Secondly, there was only one bamboo treatment centre in the area, hence no competition; there is the opportunity for the entrepreneur to manipulate and charge high prices, given the strong demand for his product. The consequence of this is that many poor households, the intended users of the product according to Proshika, are eliminated as prospective customers in an open market. Unless combined with a housing credit programme with an institutionally standardised price, Hashem's treated bamboo mats are impractical for very low-income households. Finally, if treated bamboo becomes comparable in cost to CI sheet, or marginally less, then it offers very little attraction as a wall material. The example of Rashid Ali's (HH 16) preference for CI sheet over treated bamboo, mentioned above, highlights this point.

Fig. 5.22. Grain storage bin made of treated bamboo



5.5. COMPARATIVE ANALYSIS OF IMPLEMENTATION TYPES

The two main types of implementation - agency-built and self-built - were compared by statistical tests, and the results discussed in this section. Data for the variables tested were available in categorical form, hence it was decided to carry out Chi-square tests. The Chi-square tests compared proportions of implementation types for each variable; the frequencies of these proportions are summarised and displayed in the form of bar charts for graphic comparability. As with the caveat about statistical tests for financing types, mentioned in Section 4.6. in Chapter 4, it should be noted that the size of sample in this research is not robust enough for reliable and representative statistical analysis; the intention is to explore rudimentary relationships and to identify trends in very general terms. As evident from the preceding sections of this chapter, the thrust of this research is towards understanding important qualitative issues by studying in depth a small number of diverse cases of low-income households.

Unlike financing, where numerical data was available and hence a larger number of variables could be tested quantitatively, the nature of implementation and the data collected in the field suggested that quantitative tests could be carried out mainly on two variables: preference of households for a particular implementation type, and its potential for local replicability. The significance in difference between the two main implementation types has been tested according to these two variables. It should be noted, as evident from the preceding sections of this chapter, that sub-categories with their distinct and intrinsic characteristics existed within the two main implementation types; their differences have been subsumed within the two main types for the sake of convenience. It was unnecessary to consider them independently for quantitative tests as it was unlikely to have contributed very much to the analysis and would probably have produced highly unreliable results, especially because of the small number of households in some of the sub-categories (see Table 5.1.).

5.5.1. Implementation types and household preference

Preference of households for a particular implementation type was found important in relation to one of the main methodological aspects of the research: to acquire insight into rural housing, based on narratives of low-income households, primarily about their experiences of and attitudes towards housing. Views of households were mainly expressed in terms of their preference for either agency-built or self-built housing; these views were analysed by the Chi-square test by categorising households according to the type of housing they resided in, again using the above two broad categories. The results of the test showed no significant difference in preference for implementation type between households in agency-built and self-built housing. As the minimum expected frequency was less than 5.0 in 25% of the expected frequencies generated, it was necessary to consider the results of Fisher's Exact Test, which showed that the significance p (two-tail) was greater than 0.05, and hence could not be considered sufficiently significant (Table 5.6.).

Table 5.6. Chi-square of preference for implementation types

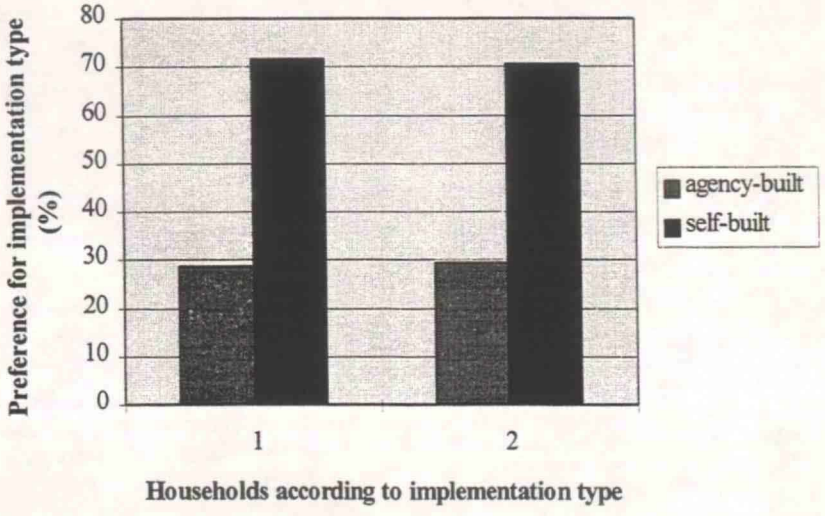
Fisher's Exact Test	Significance (*p*)
Two-Tail	1.0

A large proportion of households in both agency-built and self-built housing expressed a preference for building houses on their own, i.e. self-built housing; 71.4% of 21 households and 70.6% of 17 households living respectively in agency-built and self-built housing preferred self-built houses (Table 5.7, Chart 5.1.). Out of 40 households, two had an ambivalent attitude and were unable to state a specific preference and hence have been considered missing cases (number of valid observations = 38, number of missing observations = 2). A composite score shows that a much larger frequency, 71.1% of 38 households, preferred self-built housing, the smaller frequency of 28.9 % preferring agency-built housing (Table 5.7, Chart 5.2.).

Table 5.7. Preference of households according to implementation type

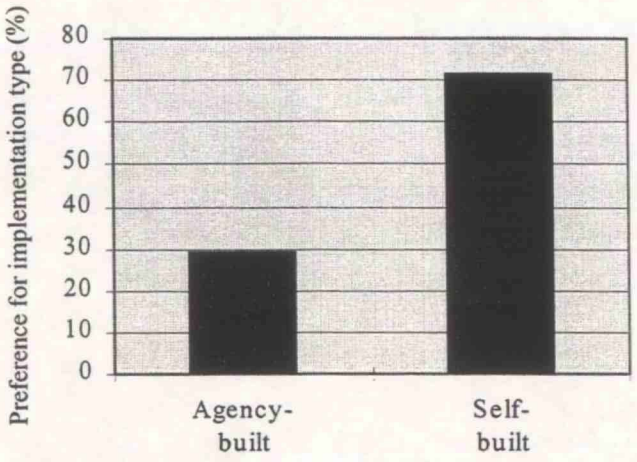
		Preference of households for		
Households living in	No. of households	Agency-built housing No. of households **(%)**	Self-built housing No. of households **(%)**	Total (%)
Agency-built housing	21	6 **(28.6)**	15 **(71.4)**	100.0
Self-built housing	17	5 **(29.4)**	12 **(70.6)**	100.0
No. of valid observations	38			
No. of missing observations	2			
Total No. of households (n)	40	Composite frequency No. of households **(%)** 11 **(28.9)**	Composite frequency No. of households **(%)** 27 **(71.1)**	100.0

Chart 5.1. Preference of households according to implementation type



1 - Households living in agency-built housing
2 - Households living in self-built housing

Chart 5.2. Composite frequency of preference of households according to implementation type



The very strong preference for self-built housing is exemplified by a remark by Juhura Khatun (HH 25): 'Even if we cannot build a house very well, to us it is still good.' Such an attitude was quite common and various reasons were given by households for their preference for self-built housing. In general these can be categorised broadly into the following, repeatedly mentioned by the majority of households in the research sample:

a) The household has greater choice in design and building materials.
b) There is more scope of control by the household during implementation.
c) There is less possibility of corruption during implementation of self-built housing.
d) Households believe that it is possible for them to build better quality houses at lower cost than agency-built houses. In this regard, several households mentioned that if funds are made available to them, on their own they could manage more effective implementation than agencies.

The last point indicates one reason why many households seek loans from agencies such as the Grameen Bank (GB): it gives a certain degree of freedom combined with accessibility to lump-sum funds. However, even some GB beneficiaries had mentioned that by themselves they could have produced or acquired better building components than those supplied by the GB and could have designed their own houses; they had decided to comply with GB stipulations to obtain a loan, and sometimes because of GB's greater degree of freedom compared to other agency programmes. Neverthess, many households (especially very poor ones) rejected the idea of a GB type loan because of the fear of inability to repay, and instead preferred to build houses entirely on their own.

It is important to note that, despite acquiring and living in agency-built housing, a larger proportion (71.4%) of such households expressed a preference for self-built housing (Table 5.7., Chart 5.1). Many of these households felt that their circumstances of poverty or devastation by disaster had compelled them to accept agency-built housing. Some had witnessed the problems experienced during implementation (such as corruption) and on post-occupancy assessment found

that the quality of construction did not live up to their expectations. They all felt that they could build better on their own if given the opportunity.

The smaller proportion (28.6%) of households living in agency-built housing and preferring it (Table 5.7., Chart 5.1.) were predominantly beneficiaries of post-disaster housing, whose former houses were generally replaced by more expensive and durable houses. Beneficiaries of the EDM and Caritas projects comprised the majority of these households. The influx of lucrative welfare commodities in their situation of devastation and impoverishment understandably determined their preference for this mode of implementation.

A small proportion (29.4%) of households living in self-built housing expressed a preference for agency-built housing (Table 5.7., Chart 5.1.). These were generally very poor households, and quite often the researcher's field visit was assumed by them to signify potential grant housing, a possible reason for them to express such a preference; some lived in proximity to grant housing projects and aspired for similar benefits. Some of these households were also in disadvantaged positions, such as being headed by a single woman, and hence felt that agency-built housing for them would be advantageous.

Although with such a small research sample it is not possible to draw precise inferences, the strongly expressed and overriding preference for self-built housing within the sample, supported by qualitative observations from a variety of sources, suggests that such a preference is probably quite common. Only under specific circumstances do households prefer agencies to provide built houses for them.

5.5.2. Implementation types and replicability of houses

Sample households were asked if their houses could be built by themselves without the involvement of agencies, in order to assess whether construction of their houses could be replicated locally. Responses to this inquiry, supported by the researcher's observations of local resources and skills, was the basis for assessing local replicability of houses. Agencies often expressed their interest in promoting improved housing within rural communities - a reason to investigate whether the solutions they implemented are replicable in the local context, in order to understand their potential for dissemination. Discussed in various places in the preceding sections of this chapter, effectiveness of implementation was often found linked to local replicability of houses; this also relates to other important matters such as household participation and post-construction maintenance. To compare the replicability of agency-built and self-built housing, the Chi-square test was utilised. The test showed that there was a significant difference between the two implementation types - agency-built and self-built - in local replicability of houses. This is shown in Table 5.8. where the significance p is less than 0.05.

Table 5.8. Chi-square of replicability of implementation types

Chi-Square	Value	DF	Significance (*p*)
Pearson	9.53	1	.002

If the frequencies of replicability across the two implementation types are compared, it can be seen from Table 5.9. and Chart 5.3. that a very high proportion (89.5%) of self-built houses was replicable. This is for obvious reasons: because of the nature of self-built housing, their households generally have to adopt implementation and construction methods achievable by them without external input. Nevertheless, two households out of 19 of self-built housing adopted a method that was not replicable, contributing to the small proportion (10.5%) of non-replicable houses in this group (Table 5., Chart 5.3.). These two households had used chemically treated bamboo; although their houses were built in a locally replicable manner in a typical self-built mode, the nature of production of treated bamboo and the implementation of the technique is not replicable in the rural context without institutional support and direct dependence on urban areas, discussed in Section 5.4.3. In contrast, other building components using manufactured materials such as CI sheet and RC posts, have become locally replicable over time, especially in rural areas with transport linkages to nearby urban areas, and are used extensively in self-built housing by households that can afford them.

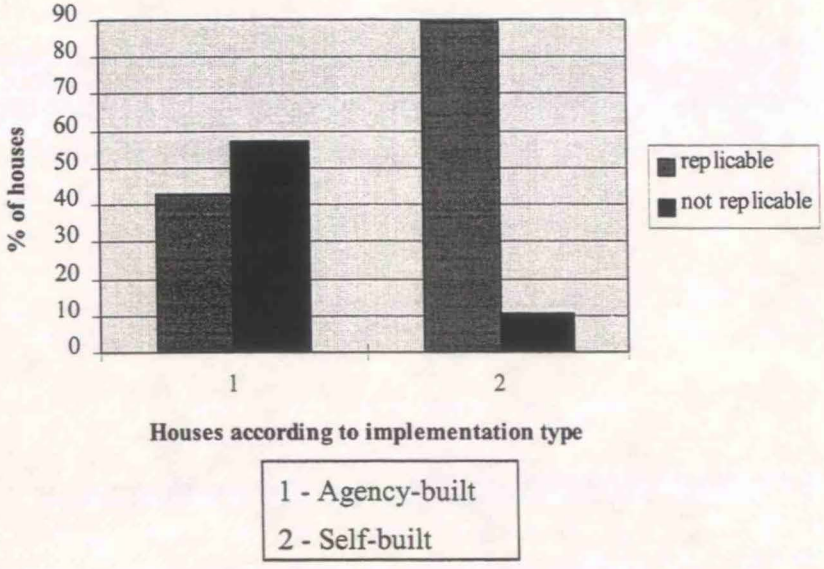
A considerable proportion (57.1%) of agency-built housing was not replicable (Table 5.9., Chart 5.3.). Even though the sample of this research is small, the households with agency-built housing were distributed across almost all of the important agency-based housing programmes in Bangladesh. Thus this finding can be assumed to represent roughly the overall replicabilty of agency-built housing. The high degree of non-replicability arose from the use of metal building components in several programmes: MS or GI angle and pipe roof frames and posts, MCR tiles, etc. It is generally not possible to manufacture these components in rural conditions without institutional input; they were usually manufactured in urban areas and then transported over long distances to project sites. In addition, many of these programmes employed a contractor whose construction team did not belong to the project areas, was trained in skills that were not local, and hence difficult to replicate locally.

Within the sample of agency-built housing, the proportion of replicable houses (42.9%) was, to some extent, comparable to that of non-replicable houses (57.1%) (Table 5.9., Chart 5.3.). This indicates that a number of agencies had implemented projects using locally available technology and labour, or at least the method adopted was locally replicable. Such methods allow agencies to reduce overhead costs, streamline management and deliver housing within local constraints of construction skills and building materials supply without resorting to unfamiliar methods or those difficult to implement.

Table 5.9. Replicability of houses according to implementation type

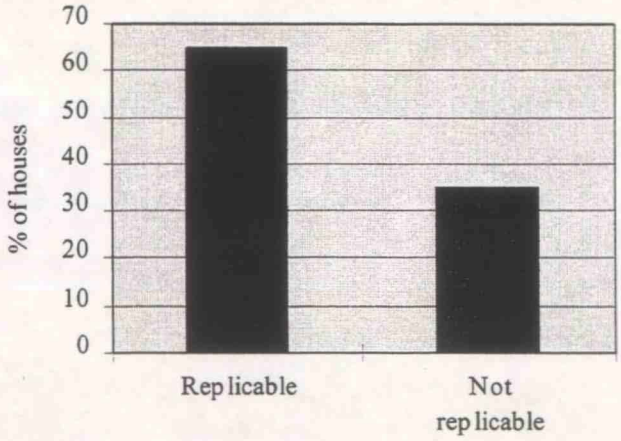
		Replicability of houses		
Households living in	No. of households	Replicable No. of houses (%)	Not replicable No. of houses (%)	Total (%)
Agency-built housing	21	9 **(42.9)**	12 **(57.1)**	100.0
Self-built housing	19	17 **(89.5)**	2 **(10.5)**	100.0
No. of valid observations	40			
No. of missing observations	0			
Total No. of households (n)	40	Composite frequency No. of houses (%) 26 **(65.0)**	Composite frequency No. of houses (%) 14 **(35.0)**	100.0

Chart 5.3. Replicability of houses according to implementation type



Although in comparison to self-built housing agency-built housing appears significantly less replicable (89.5% versus 42.9%), there were several examples of replicable agency-built housing (9 out of 21 houses, i.e. 42.9%) (Table 5.9.). This also contributed to the larger composite frequency of replicable houses (65.0%) compared to that of non-replicable ones (35.0%) (Table 5.9., Chart 5.4.). Because a number of agencies had built non-replicable houses, and their inclusion in this research for investigating the effects of non-traditional housing by agencies, there is the possibility that the sample might be biased. Nonetheless, because there were such programmes, it can be asserted in broad terms that agency-built housing on the whole is significantly less replicable than self-built housing; mainly because the latter was self-built, it tended mostly to be replicable.

Chart 5.4. Composite frequency of replicability of houses



A point needs to be mentioned here: replicability of houses is not of high priority in household preference for implementation type. This is supported by qualitative findings indicating a different set of priorities guiding household preference, presented in Section 5.5.1. Not a single household was found to mention a preference for a particular implementation type because of its quality of replicability (or not). By and large, the issue of control by households emerges as the overriding factor in preference for self-built implementation. It appears that even when non-replicable houses are provided, if the household has a high degree of control during implementation, it would prefer that mode of implementation. There were also households that were glad to receive non-replicable building components, and expressed a preference for agency-built housing because of such benefits; they felt that they had benefited by obtaining relatively durable components or because such components could be sold off to achieve other aspirations.

For agencies, replicability might amount to an important issue if they are interested in introducing and disseminating improved construction techniques in the rural context. However, this does not appear to be the concern of many of the agencies studied in this research. For them, the objective is often to provide housing more durable than houses generally built by low-income households (see Chapter 6, Section 6.5.1.), and to achieve that, non-replicable houses are provided. Nevertheless, low-income rural communities in Bangladesh are not necessarily passive recipients of welfare. They have the capacity to adapt innovations and also to innovate themselves. The example of the widespread adoption and replicability of construction with the once non-traditional and unfamiliar RC posts illustrates this point.

5.6. SUMMARY AND CONCLUSIONS

Introduced at the beginning of this chapter, the following question has been addressed throughout:

> **To what extent does the process of implementation of housing of low-income households in rural areas facilitate effective production and management of the housing?**

Answers to this question were attempted according to the different types of implementation and their important aspects. In this section, the main findings are summarised and conclusions derived from them are presented. The relationship of this chapter to other chapters and its wider implications are also discussed.

5.6.1. Summary of findings

The following points summarise the findings in this chapter:

- In housing built entirely by agencies without any involvement of beneficiaries, contractors were generally employed to undertake the projects on a turnkey basis. It was found that involvement of contractors usually results in corruption, affecting the quality of construction. Corruption was often evident also in the process of selection of beneficiaries. In general, in most of the projects studied, land was developed, housing built, and then provided to beneficiaries. In such a method of implementation there is hardly any scope to involve beneficiaries; in many cases beneficiaries were not even selected before commencement of projects.

- Some agency-built projects were part of post-disaster rehabilitation programmes where houses were built on beneficiaries' land after their previous houses were destroyed by natural calamities. Even though these projects also adopted a contractor-built mode, typically transporting pre-fabricated components from outside and only assembling them on site, beneficiaries were nevertheless involved to a very limited extent during construction in simple menial tasks because work was undertaken on their sites. Corruption similar to that in completely agency-built projects was also evident.

- In some agency-built projects beneficiaries were partly involved and allowed to participate within demarcated domains in building houses on land owned by themselves. A typical example was where the agency supplied building components, transported to site by the beneficiary, and the house then built by workers provided by the agency, with the assistance of beneficiary household members. However, because of involvement of beneficiaries only during construction, without consultation in policy decisions and in earlier stages of the project, there was scope for institutional corruption and beneficiary dissatisfaction. In some projects, it was possible for the household to participate effectively in advancing its own interests, but for more vulnerable households participation became onerous, if not impossible.

- In most of the agency-built projects, houses began to deteriorate a few years after completion and households were either unable or unwilling to maintain them. This is usually related to the nature of organic materials which deteriorate rapidly in the climatic conditions of Bangladesh, but some agency staff suggested that lack of maintenance by beneficiaries was also responsible. According to them a 'relief-culture' has pervaded rural communities, resulting in undue expectations and reliance on agencies. Nonetheless, it was also found that maintenance

was sometimes unaffordable by households, or difficult because of the type of construction technology adopted.

- In houses built without any involvement of agencies, households have to rely on local construction skills and often on common property resources for materials. In the present context, a variety of difficulties is found to be associated with this mode. For very poor households, there is little possibility of progressively upgrading their houses and they are compelled instead almost to rebuild their houses annually. In spite of these problems, households expressed a degree of satisfaction at being able to control the implementation of their house construction.

- Some households obtained loans from agencies, but built houses on their own. However, in these cases, agencies provided some building components and households were required to utilise them as a condition of the loan. Some of these components are locally replicable or available, and some households expressed dissatisfaction at having to purchase them from the agency. This mode offered greater choice to households than agency-built housing, but that was not necessarily the reason why households opted for it; quite often, the possibility of accessing lump-sum funds was the main attraction to households.

- A unique method adopted by a particular agency is to support rural building material entrepreneurs in producing building components. This is also pursued as a strategy to disseminate non-traditional components, such as chemically treated bamboo mats. However, the main obstacle to dissemination of the latter is the lack of easily available raw materials. There are other problems, such as potential hazard in handling chemicals and manipulation of price by the entrepreneur. These adversely affect the well-intentioned attempt to address issues of rural employment and scarcity of natural materials such as bamboo.

Two variables were found important in further understanding the implementation process:

1. Preference of household for implementation type: The preference of households for either agency-built or self-built housing and reasons relating to this preference illuminated the advantages and drawbacks each implementation method presented to the households.

2. Replicability of houses: This is an important indicator of production of houses and effective management in the local context and, in some cases, of the potential for dissemination of innovative or non-traditional construction. It is also linked to the possibility of unconstrained maintenance by households. Nevertheless, agencies and beneficiaries pay little attention to this point.

The following results were produced when the two main implementation methods were compared across these two variables:

- Irrespective of whether households lived in agency-built or self-built housing, it was found that a large majority of the sample of this research expressed a preference for self-built housing. A variety of reasons was given by households for this preference; on the whole, the possibility of a higher degree of control by the household during implementation appears to be the main cause for this preference.

- Within the research sample, self-built housing was found much more replicable than agency-built housing, although a substantial proportion of agency-built housing was also replicable. However, there were several agencies that had implemented housing using building components that generally could not be produced in a rural context; because of this lack of replicability, households often found it difficult to maintain such housing.

5.6.2. Conclusions

In this chapter, the level of involvement of households in implementation of housing has been a basis for classifying the categories and sub-categories of implementation types. This has allowed a discussion of the different levels and variety of relationships between low-income households and agencies interested in assisting them. It was found that in many cases, despite well-meaning intentions, this relationship was fraught with various difficulties; even within the organisational setup and between agencies with similar objectives, there were anomalies and tensions. A basic conclusion of this finding is that households are best able to advance their own interests in situations where the role of the agency is minimal. This is not to suggest that agencies do not have an important role. Their importance lies in a selective assistance of vulnerable households for whom intensive participation is not viable and in assisting others to realise their aspirations without imposing upon them the agency's notions of an effective mode of operation.

Unethical behaviour, such as corruption, was often found a typical institutional feature. In a context of poverty and a less developed organisational culture, this can be believed inevitable. However, also in the non-institutional context, there was evidence of a decline of traditional ethics and permeation of an overtly materialistic and opportunist outlook. This largely resulted from the limited authority of the existing institutional milieu in a context of contested access to resources, combined with the general expansion of the cash economy.

There were attempts to forge a different kind of relationship between the institutional and non-institutional realms, i.e. between the formal and informal sectors. The support by agencies of informal sector entrepreneurs is an example of such a relationship. Notwithstanding the potential for opening up the possibility of more effective implementation than the agency-built mode, it was found that such a relationship was at a rudimentary stage and required a great deal of attunement before it could be considered a viable option.

Conventional theoretical dictum in development discourse, such as of the merits presumed associated with household participation, incremental house construction, organisational

partnerships and self-help housing, were all tested against actuality in this chapter. It was found that such merits must depend on context, and in many cases their existence could be seriously questioned. To maximise benefits for all parties involved, such concepts at very least require clarification according to particular situations, and often require specific interpretation.

Nevertheless, encouraging to any researcher in this field, despite the many difficulties in forging relationships between various parties during implementation of housing, many agencies continue to operate and are genuinely committed to the improvement of habitat of low-income communities. Since problems experienced are often strongly linked to social structure, well-intentioned attempts are consistently thwarted. It was also evident that there was a general lack of appropriate skills and understanding among agencies in carrying out such projects, further contributing to difficulties. It must be hoped that the willingness demonstrated by agencies to continue working to improve housing conditions of low-income communities will be matched over time by a willingness to learn from experience. But one should not be overly optimistic about such change in a context riddled with difficulties.

5.6.3. Wider linkages

As this chapter focused on implementation, its relationship to the other important aspects of housing, including financing and building design, was not emphasised. However, several such linkages exist. For example, all the cases of grant housing were agency-built, and there were no examples where agencies had provided financing in the form of grants to households to build their own houses. On the other hand, housing loans in some programmes were utilised for self-built housing. There are also linkages between implementation and housing design, such as the examples of various types of construction technologies relating to implementation, discussed in this chapter. It is necessary here to point out that such linkages do exist, despite the methodological approach of classifying and dealing with the main thematic aspects separately. In Chapter 7, linkages between these aspects are brought together and discussed in detail.

Agencies often tend to work in isolation and competition, and thus do not benefit from exchange of experiences. Frequently, agencies also operate without attempting to gain from the experiences of low-income households. Therefore, this study of the varieties of implementation by different agencies, and also households, has attempted to assemble comprehensively experiences and knowledge from a diversity of sources in order to be able to offer policy guidance. It is hoped that information drawing on such diversity within a particular context may also prove useful in the general field of development studies in the wider context.

• *CHAPTER 6*

HOUSING DESIGN

6.1. INTRODUCTION

Chapters 4 and 5 dealt with two stages in the process of housing, to a large extent sequential; that is, acquiring funds and implementing house construction. These stages are preliminary to habitation by occupants; post-occupancy characteristics of housing designs and their intrinsic features allow further insight into the housing process. Whether and how far the design of the housing met the requirements of the different parties involved in their production and use is discussed and analysed in this chapter to find answers to the third derived question:

> **What characteristics of design and physical organisation of rural housing in specific contexts best fulfil performance and satisfaction criteria for all stakeholders?**

A variety of houses in different geographical regions of Bangladesh were studied and documented. Additional information on these houses was gathered from various informants including occupant households, community members, local builders, agency staff and fieldworkers. Houses were either designed by occupant households or built according to a design prescribed by agencies, although in some cases there was a degree of overlap between these two modes. In such cases, households had provided input into design during implementation, or had implemented house construction on their own, loosely complying with a stipulated agency design. Nevertheless, because of the involvement of agencies, these cases have been considered as examples of housing designed by agencies. Only those houses built by households completely independently of design input by agencies are considered self-designed. This categorisation does not coincide with those followed in analysis of financing and implementation types, and has been adopted in this chapter specifically for analysing house design. For example, in the case of financing, a household may have taken a loan from an agency for house construction, but built it according to its own design. Or, during implementation of house construction, a household may have built the house on its own, but followed a design recommended by an agency.

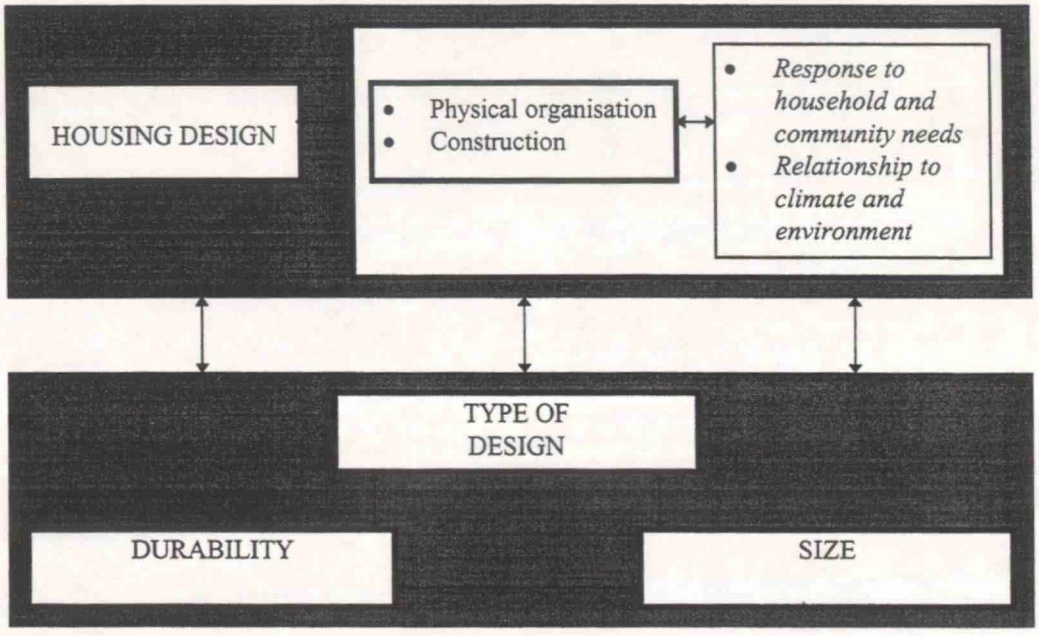
The chief aspects of housing design considered in this research are construction technology and building materials, mainly because of their greater diversity than space arrangement and layout, and also because they raise a large number of issues crucial to this research. As traditional and natural building materials typically used in self-built housing have been discussed earlier in Chapter 2, in this chapter mainly non-traditional and manufactured materials, often utilised or promoted by agencies, are dealt with. Traditional or natural materials are referred to where relevant to the discussion of manufactured materials, especially to highlight important differences. Related aspects of design, including space arrangement and layout, response to household needs,

climatic and environmental attributes are discussed in relation to building materials and construction.

As described in Chapter 2, Section 2.3.2., different functional spaces are quite often distributed in different locations in the homestead and accommodated in separate buildings, some of which are ancillary to a main dwelling unit. This research has focused primarily on the main dwelling unit; ancillary buildings are discussed when they have a bearing on the main unit or site layout. Although this chapter is largely concerned with construction aspects of house design, it is necessary to begin with a section on physical layout of sites in order to provide a comprehensive understanding of housing design. A methodological approach has been followed, consisting of introducing the wider aspects of design, that is site layout and spatial arrangement, and then narrowing down to focus on details of parts of the building.

In Chapters 4 and 5 where the actions of agencies and households are discussed separately and then compared, and comprise the bulk of the subject matter of the chapters, in this chapter this approach was found less suitable for the major part of the analysis. Therefore a different approach is followed, especially when discussing construction and building materials, focusing on types of design concept and how they were applied in the main parts of buildings. Other aspects of design are also discussed, and where relevant, designs by agencies and households are compared. A qualitative analysis of two main aspects - physical organisation and construction - responding to two main concerns - response to household and community needs and relationship to climate and environment - comprises a substantial part of the chapter. This qualitative analysis is supplemented by quantitative analysis comparing design types, quality of housing according to durability and size of houses, and relationships between these factors. When drawing conclusions at the end of the chapter, linkages to other parts of the research and the broader implications of the findings of the chapter are considered.

Fig. 6.1. Basic analytical framework (housing design)



6.2. TYPE OF HOUSING DESIGN

Of the forty sample households, fourteen had no input from an agency into house design, whilst the remaining households received input of some form. The two are classified here as self-designed and agency-designed housing respectively. The latter type ranged from houses built entirely according to an agency's design to those where households had varying levels of opportunity to incorporate their own design decisions. Although households 22 and 40 sold off houses obtained from agencies (EDM and WVB respectively) and subsequently built houses on their own, they have nevertheless been included in the agency-designed category because information on their former houses was available; this information has been utilised in the quantitative analysis in Section 6.5. The two categories of housing design with their respective households are shown in Table 6.1. A consistent numbering system for the households (HH) has been followed throughout the research and is shown in Appendix A.3., Table A.3.1., which also shows some of their main characteristics. A frequency count of cases in each category is also given in Table 6.1.

Table 6.1. Categorisation of design types

TYPE	HH NO.	NO. OF HH	%
Agency-designed	1, 2, 6, 8, 9, 11, 12, 13, 14, 18, 20, 21, 22, 23, 24, 26, 27, 29, 30, 32, 33, 34, 35, 37, 39, 40	26	65.0
Self-designed	3, 4, 5, 7, 10, 15, 16, 17, 19, 25, 28, 31, 36, 38	14	35.0
	TOTAL	**40**	**100**

6.3. PHYSICAL ORGANISATION OF SITES AND HOUSING

The physical organisation of sites is considered here as an aspect of housing design; built structures and service amenities dispersed within a site usually composed homesteads in both agency-planned and traditional layouts (unlike larger single buildings with several rooms fulfilling different functions, evident in urban contexts or other parts of the world), although there were differences within this layout. Since there were some examples of site planning by agencies which differed significantly from traditional settlement patterns, it was decided to study them in order to garner a complete picture. Although some of the typical traditional settlement patterns have been discussed in Chapter 2, Sections 2.3.1. and 2.3.2., relevant findings from fieldwork in this regard are included here as a parallel to agency-based physical planning attempts.

There were only slight differences in spatial arrangement within the house between agency and self-designed houses; most houses were rectangular, usually a single room or in some cases one room divided into a few functional spaces. Some houses had extensions to the basic rectangular

room. Because of this overall similarity, an analysis of houses according to spatial arrangement is not carried out in detail. Nevertheless, spatial arrangement within the house is discussed where a relationship between it and organisation of the site is evident. It should be mentioned that despite the lack of notable difference in form, one of the main differences between house types was in terms of size, discussed in Section 6.5. Sample houses differed widely in the use of building materials and construction techniques, the reason for the emphasis in this chapter on these aspects of house design.

6.3.1. Planned settlements by agencies

Most housing programmes provided houses, in many cases as reconstruction after disasters, on land owned by beneficiaries. Sites were generally organised by households themselves, in keeping with typical local patterns in relation to existing settlements, and thus these programmes cannot be considered examples of planned settlements. Two programmes, however, attempted to build planned settlements. One was the government's Adarsha Gram (AG) programme under the Ministry of Land, which settles a selected number of households on a piece of land, granting them contiguous homestead land, houses and other facilities. Some projects are executed in collaboration with NGOs; cases of this type included in this research were carried out in conjunction with World Vision of Bangladesh (WVB), referred here as the AG-WVB projects. In these projects, land on which WVB designed and built the physical layout and housing was made available by the government. Some of the important aspects of the AG and AG-WVB programmes were discussed in relation to financing and implementation in Chapter 4, Section 4.4.2. and Chapter 5, Section 5.3.1. respectively.

The other programme is that of the Grameen Bank (GB), which built smaller settlements for its housing loan beneficiaries. Unlike the AG programme, predominantly a settlement planning programme, GB housing is individualistic. In general, most GB housing loan beneficiaries build houses on land within existing settlements, often scattered in different locations within villages. There are also examples of GB borrowers from different villages becoming acquainted through GB group meetings, and thereby deciding to obtain housing loans and build their own settlement. This is somewhat akin to self-organised sites, discussed below in Section 6.3.2., hence it is not dealt with here. Some of the critical features of the AG, AG-WVB and GB settlement planning programmes are compared and discussed below, and Table 6.2. summarises some of the basic site planning issues shown in the case studies of this research.

6.3.1.1. Role of location

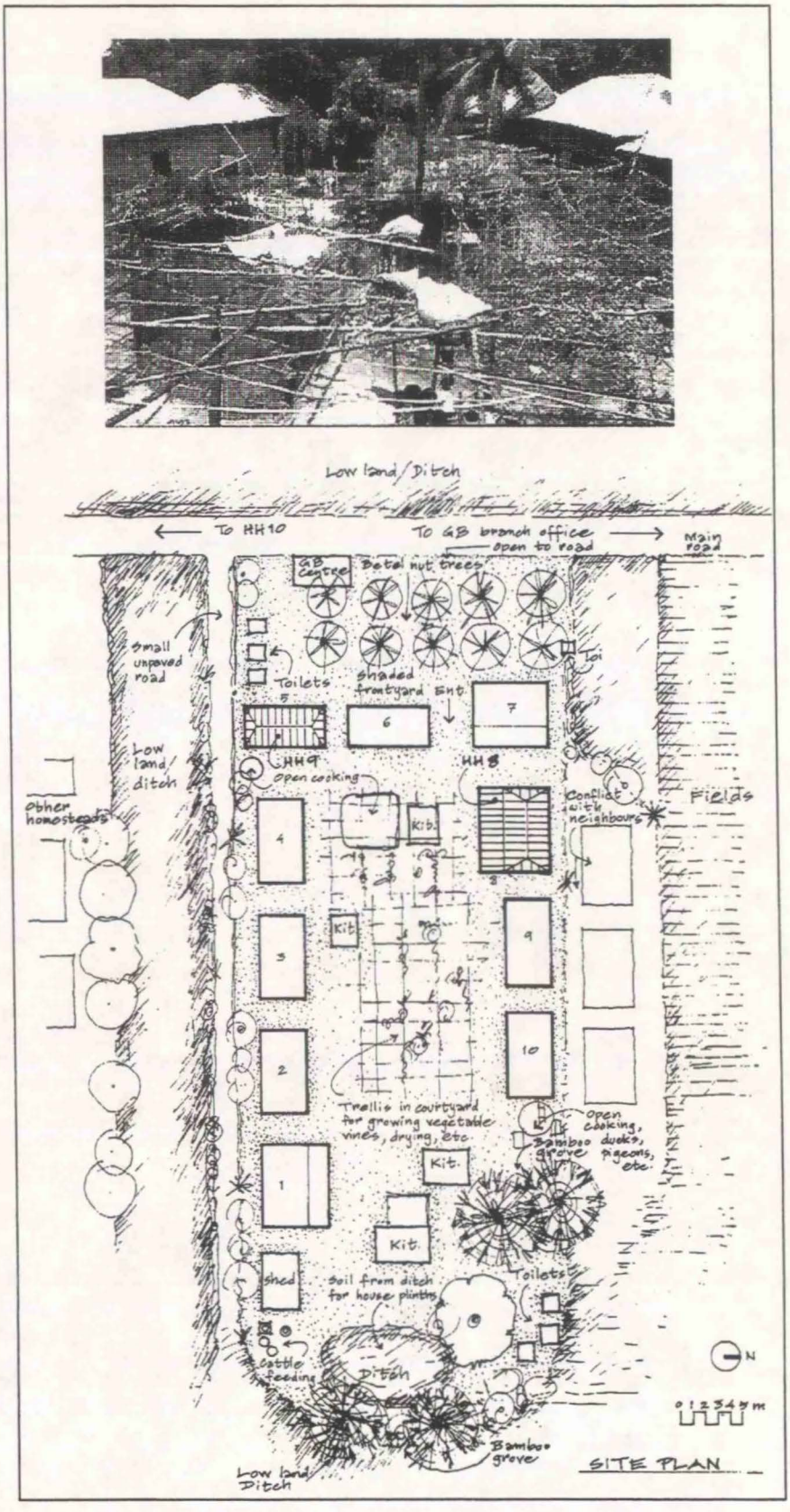
The AG settlements are on distributed public (*khaas*) land; in a land-hungry context such as Bangladesh it is often difficult to find vacant public land suitable for establishing a settlement and not remote. Thus it is usually necessary to incorporate elements such as road connections into settlements, or to prepare otherwise uninhabitable sites. As beneficiaries of the AG-WVB project in Chittagong described, the site was formerly hilly and hills had to be levelled before the settlement was built. Close to the coast and composed of sandhills, the sandy site required topsoil

before vegetation could be planted. The beneficiaries remembered it as very barren and inhospitable initially, but took pride in claiming that they had managed to grow sufficient trees over the years to make it more habitable. Various factors contributed to the beneficiaries' initiatives in upgrading the site and their houses: secure tenure, a WVB site office with ongoing community development programmes, local employment opportunities, and, a good road connection. On the other hand, an AG settlement in Dinajpur was abandoned by most residents after the embankment serving as a road was breached, flooding part of the site and severing transport connections (except for country boats seizing the opportunity to charge high fares). Although this settlement was rather isolated initially, at least there was at first an unpaved road connection; once that was severed, living there was no longer viable.

Table 6.2. Basic features of site planning in case studies

Programme and location	No. of households	Year built	Basic issues
AG, Dinajpur (1)	150	1993	• Abandoned because of poor location and breached embankment • Grid layout with potential for organising for household needs
AG, Dinapur (2)	70	1993	• Good location • Original grid layout • Households had re-arranged and organised site to fulfil their needs
AG-WVB, Chittagong	40	1990	• Good road connection and location • U-shape layout with houses lining the site boundary, presenting problems of privacy • Backyards and large central open space to accommodate outdoor activities
AG-WVB, Cox's Bazar	80	1988	• Moderately good location • Problem of water run-off from hills, aggravated by household interventions to obtain space and building materials • Linear layout with narrow internal road, presenting problems of privacy
GB cluster-village, Manikganj	10	1993	• Good location and land raised above flood-level • Houses along boundary with central open space cluttered up with additional structures • Overcrowding and serious problems of space shortage • Conflict with neighbours

Fig. 6.2. The GB cluster village in Manikganj



Unlike the AG settlements where sites are selected by the agency, in the GB settlement (here onwards referred to as the GB cluster-village, its common term) studied in this research, the land was chosen by beneficiaries who then solicited GB's approval. In this project, households of ten existing GB general loan borrowers were rehabilitated after they lost their properties due to

riverbank erosion. They belonged to the same area, hence it was not a settlement of strangers as were AG settlements. The site had a good road link and was on raised land which, unless there were exceptional floods, did not become easily flooded in this flood-prone region. However, because of such features, the land was expensive, and all ten households were compelled to settle on an inadequately sized site, resulting in major problems of crowding and lack of space. The typical practice of incremental extension of the house and addition of ancillary structures was curtailed severely by the limitations of the site. It was difficult to carry out typical rural activities such as rearing cattle and poultry and home gardening, and household privacy was virtually non-existent. For the predominantly female GB beneficiaries, such activities form a major source of income for loan repayment [for example, 49.2% of GB general loans were for livestock and fisheries in 1985 (Rahman 1994, p. 15)]. One of the residents, Naz Jahan (HH 8) complained:

> There's very little space for keeping chickens or feeding cows. We would have had a better income if there was more space as we did on our previous homestead before the river took it away from us.

This problem of space shortage is bound to become aggravated over time as families grow. GB staff members are aware of the problem, which they had not envisaged when the settlement was established. A staff member who was in a junior position when the project was implemented and hence did not have the necessary leverage to influence policy observed:

> The cluster village has become like an urban slum. It wasn't planned properly and it has now become crowded and unhygenic. If I had my way, it would have been different. New projects should be designed more carefully.

6.3.1.2. Basic infrastructural services: water and sanitation

To make it habitable, a site also requires basic infrastructural services such as water supply and sanitation. In the AG settlements, tubewells are installed, usually in the ratio of fifteen households per tubewell. However, tubewells have a high re-sale value, and it is common in many settlements for them to be stolen. Generally, in other rural settlements, households that can afford a tubewell install it within their homesteads, allowing greater security. In the AG settlements, because of the need for sharing, the tubewells have to be placed outside, with no particular household responsible for vigilance. Rohima Khatun (HH 12), an AG beneficiary, mentioned the theft of the tubewell her household shared with other beneficiaries. Her household subsequently bought a new tubewell and installed it within its homestead. Rohima did not mind sharing it with other neighbouring households which could not afford to buy their own tubewell but could pay for the water with small sums of money or in kind: 'It's not right to stop people from drinking water'. This brought in a small income to Rohima's household.

This example suggests the possibility of nominating households from the community which would benefit from a tubewell on their property by earning an income and would keep guard over it in exchange, allowing the community to benefit from it too. To have fewer than fifteen households sharing the tubewell might be more workable, as in Rohima's case, where the tubewell was shared

with a small group of neighbours. In the AG-WVB project in Chittagong, tubewells were placed in the backyards of specific beneficiaries, each one to be shared with other households. Subsequently, finding the number of tubewells inadequate, residents themselves installed extra tubewells, resulting in a ratio of four to five households per tubewell. There did not appear to be any problem associated with shared tubewells in this community.

GB beneficiaries often take out separate loans for buying tubewells to install on their homesteads. One of the 'sixteen decisions' of the GB's social development dictum, recommended to beneficiaries, consists of the statement: 'We shall drink tubewell water' (Rahman 1994, p. 12). However, in the GB cluster-village no tubewell had been provided. Residents used the nearby river for bathing and washing, or adopted strategies such as Moinu Mia (HH 9), who was fortunate enough to have a friend in a neighbouring settlement who shared his tubewell. After the cluster-village had been established, serious conflict with original neighbouring residents developed. It appeared that these neighbours were pilfering fruit from the cluster-village residents' trees, cutting wood in stealth, and other such acts, leading to hostility in this locale. Installing tubewells in the GB cluster-village might further aggravate this discord. Besides, the placement of tubewells itself might present problems: issues such as where to install them on this tight site and how many to install would be difficult to resolve. Eventually, two of the residents purchased tubewells of their own and installed them next to their houses. They shared them with a few other residents, but generally they were somewhat possessive about the tubewells, because of conflict with neighbours, and carefully guarded against their use by others. Moinu Mia (HH 9), who did not have a close relationship with the owners of the tubewells, continued to avail himself of his friend's tubewell in a neighbouring homestead. Water supply in planned settlements presents a fundamental problem.

Sanitation is another problem. Not only in planned settlements, but in general where agencies had provided sanitary pit-latrines, during fieldwork it was found that the latrines were generally not operational. Households usually said that 'they were broken' or 'they had filled up and become dirty'. In most of the contractor-built projects, due to corruption during implementation, the quality of latrines was indeed poor and they broke easily, as in the AG settlements where Sudipto Chandra Ray (HH 11) and Rohima Khatun (HH 12) lived. These were not sufficiently deep as only three instead of five concrete rings for lining the edge of the pit were provided; hence they did fill up quickly.

For the GB, there are very few policy guidelines for physical planning of settlements and GB-financed small cluster villages were usually planned by inappropriate personnel without relevant experience, hence often producing poor results. An evaluation of the GB housing programme in 1989 reported thus on a GB cluster-village:

> In this layout the 15 houses with [their] homestead land form a rectangular chain around a central rectangular community-owned area to be kept free. The sanitary latrines are lined along the 4 outermost peripheries, close to natural water sources. This layout does not meet the

requirement of differentiated hierarchy of spaces, it presents an unattractive view to the outside with rows of latrines and it is undoubtedly a health risk. On the whole, the village will soon become a slum type settlement.

(Islam *et al* 1989, pp. 34-35)

The report strongly recommended careful planning of cluster villages, but the cluster-village studied in this research, built four years later, had very similar features to the one mentioned above. The same poor physical planning principles had been applied, with toilets on the outside, in this case facing a main road on one side. In addition to presenting an 'unattractive view', women were reluctant to use these toilets during the day because of a lack of privacy, and passers-by on the road were exposed to the smell from the toilets. Within a short time the toilets had mostly ceased to be used or damaged. Some toilets at the rear end of the site were in somewhat better condition. However, these were hardly sufficient for all the residents, and generally most resumed the traditional habit of defecating in surrounding fields. Part of the reason behind ill-use of toilets could be cultural; low-income villagers are not accustomed to the use of latrines and their maintenance. As a GB staff member suggested:

Vignette 6.1. Rural culture and pit-latrines

Although JBP did not build planned settlements, it had built pit-latrines for beneficiaries of its housing loan in the offshore island of Bhola. Mohammed Ejaz (HH 13) and four other JBP beneficiaries lived nearby, and latrines had been built for them right next to each other, possibly a bit too close for comfort. Beneficiaries were expected to build screens around the latrines, and because bamboo was not grown extensively on this island, the alternative screening material was palm frond.

Nurunnahar Begum, another JBP beneficiary, informed the research team that the sharp fronds could inflict injury in the narrow latrine cubicles, and children were especially vulnerable; it seemed that they also harboured poisonous insects. During her narrative, a boy interrupted and accused her of disagreeable toilet habits. He said that due to her reluctance to use the latrine, it had become dirty and issued a repulsive odour, making it unpleasant for the others to use the nearby latrines. Nurunnahar was incensed by these remarks and a fierce confrontation arose. It was clear that the toilets were a source of conflict within the community.

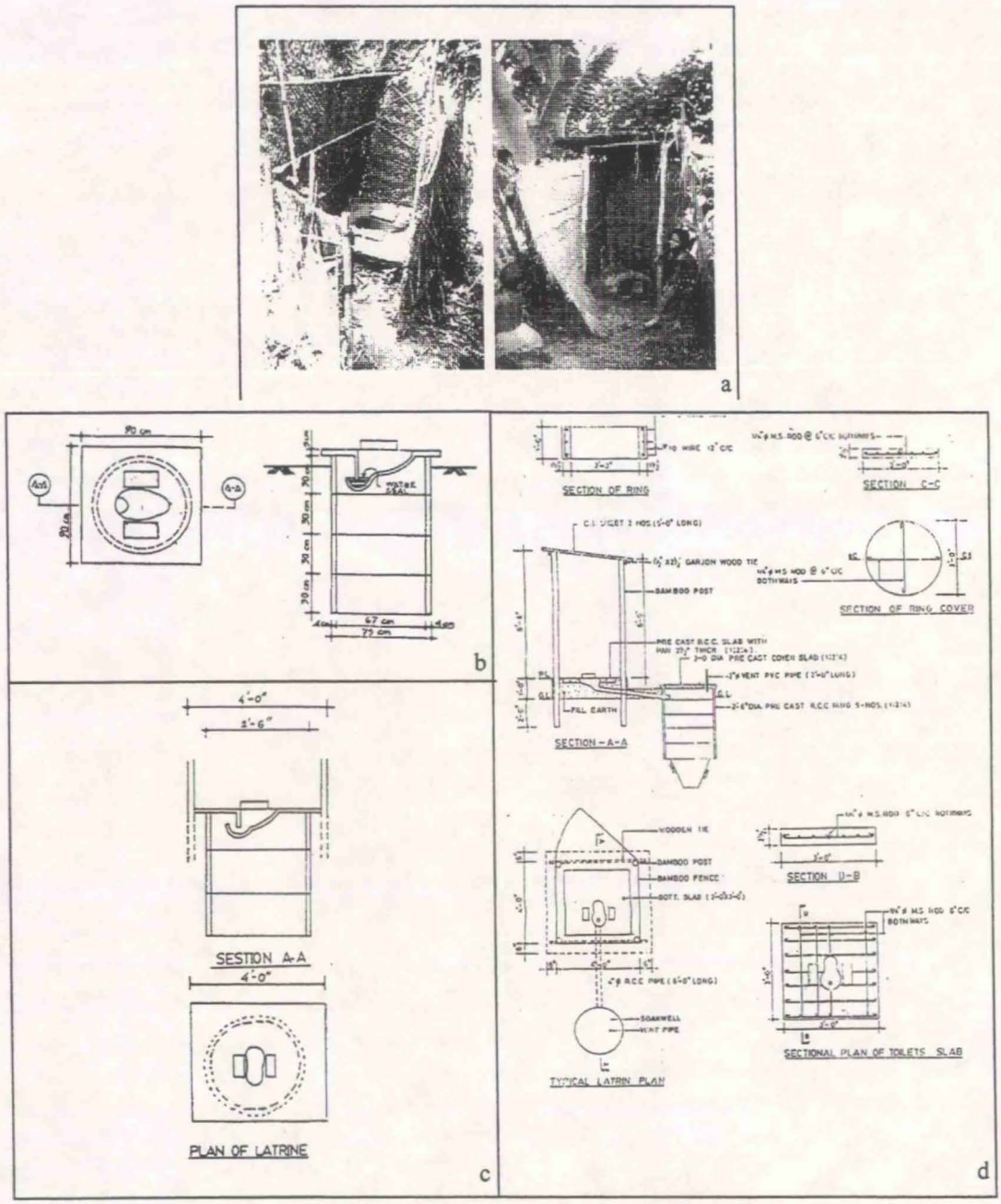
Nurunnahar's account requires examination. Ejaz's toilet appeared quite functional with its palm frond screen and he did not complain of any problem. Palm frond is used extensively as a building material in Bhola, and whether they harbour any more or any fewer insects than other organic building materials is open to question. Perhaps Nurunnahar was right, but the question lingers: was she simply finding an excuse not to use her latrine, for reasons that remain unexplained?

> Villagers think that the toilets are dirty and don't want to use them. Of course they get dirty, but they have to be cleaned regularly and properly, which they don't want to or know how to do. In the cluster-village they have broken all the water seals by trying to clean them.

Latrine design is also important. One of the main reasons why latrines were abandoned is because the pit is directly below the concrete toilet slab (Asian-squatting type), and once it fills up it is a dirty and unpleasant task to lift off the slab and place it on a new pit. In addition, because the pit has no vent, foul odour issues from the latrine, contributing to the perception of dirtiness. In the AG-WVB settlements, after all the latrines had been abandoned, WVB designed an improved version at a slightly increased cost. These have a pit at a distance and are provided with a vent; after a period of use, it is possible to remove the toilet slab easily and connect it to a new pit. In the

settlement in Chittagong, thirty of the improved toilets were recently installed and ten more were in the process of being supplied. It was too early to draw any definite conclusions about the effectiveness of these toilets, but it appeared that they were working better than the previous ones.

Fig. 6.3. a. Some latrines provided by agencies; b. GB latrine; c. AG latrine; d. WVB latrine
(drawings excerpted from project documents of agencies)



There was hardly any evidence of planned drainage of sites and garbage disposal; residents usually managed these on their own, according to local and traditional modes. An example of problems that might occur if such aspects are not considered is illustrated by the WVB settlement in the hills of Cox's Bazar. Because of lack of utilisable open space, beneficiaries had cropped off hills at the back of houses to create backyards; this also provided them with earth for construction of extensions to the houses. However, this denuded the hills, making them susceptible to rapid water run-off during the rainy season, the water carrying down soil and further eroding the hills. The settlement became extremely muddy after a period of rain. Movement became difficult within the

site, and additionally, access to the site was severed. The beneficiaries were disgruntled by this and could not conceptualise a remedy; no assistance was forthcoming from AG-WVB either. Such a situation might not have arisen had the settlement been planned more thoughtfully.

6.3.1.3. Varying approaches to house arrangement on the site

The arrangement of houses on the site is another matter that requires competent physical planning and design skills. All the planned settlements studied in this research had serious shortcomings in this regard, but they did have a few plus points. It is necessary to review each case and identify lessons that might be gained from them.

In the AG-WVB settlement in Chittagong, houses were arranged in a rectangular U-shape around an open space, with the WVB school and site office placed in the open end of the U (see Fig. 6.5.). The majority of houses were orientated along the east-west direction and could not benefit from the prevailing southern wind for natural ventilation. As this was originally vacant land, levelled and prepared for the project, it could have been planned differently from the outset; site conditions did not impose the longitudinal north-south shape. It might be argued that the main road on the northern side necessitated such a shape because of the need to minimise road frontage. However, that would be simplistic; a more skilful designer might have managed to incorporate both proper orientation and optimal road frontage.

The houses were originally arranged with about a 1.25 metre gap between them, and these gaps became very muddy in the rainy season and beneficiaries did not find that they served any purpose. Hence they decided to extend and join the houses, closing the gaps. This allowed a more private backyard for each household and also added necessary extra space within the house. However, this gave rise to a new problem: because of shared walls there was very little privacy between adjacent households. As Jannatara Islam (HH 34) pointed out:

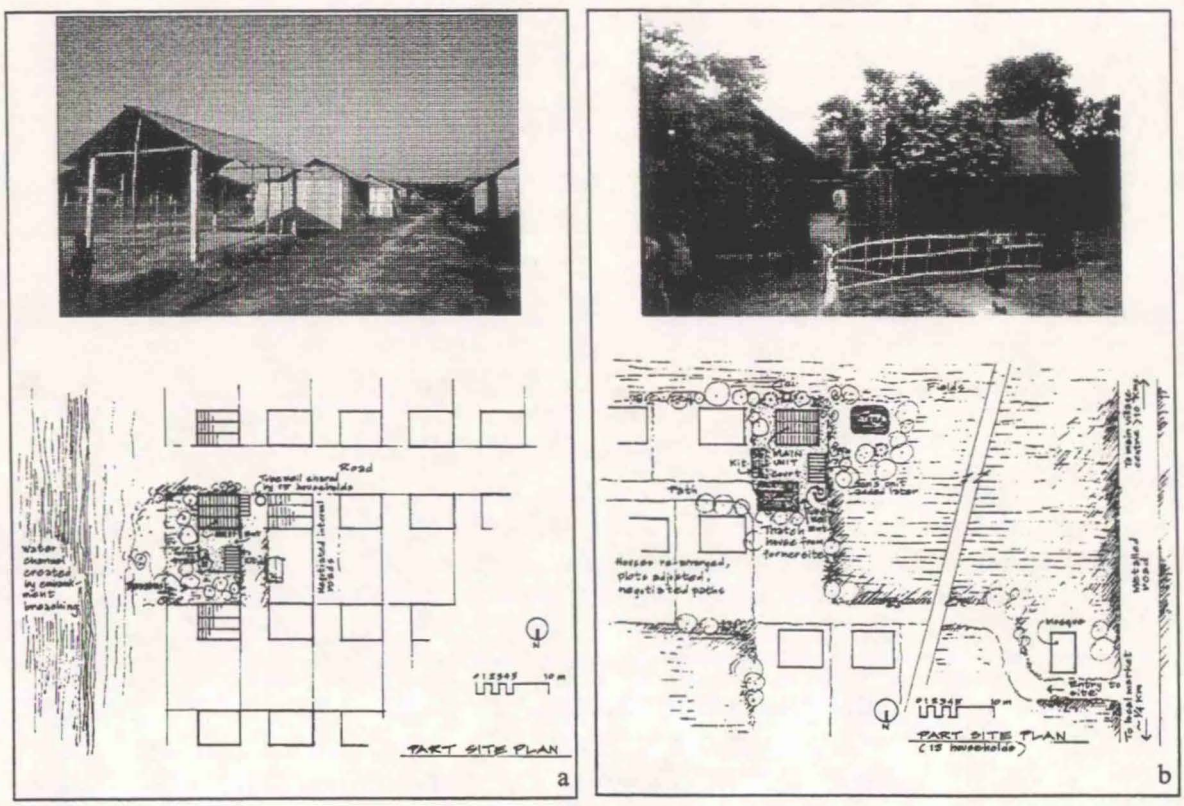
> In village homesteads we usually live within a compound with relatives, so there is less need for privacy there than here in this community of strangers. Although we have got to know each other well over these years, we still don't want to share all secrets. But people in houses next to each other soon begin to know everything about each other; it's hard to keep household matters concealed. Often this is a reason for conflict between neigbours. To discuss private matters we have to go out of the house elsewhere.

Originally, a community centre and a fishpond was planned for the central open space on the site. Perhaps a blessing in disguise for the residents, these had not been carried out. Hence the space remained open, subsequently planted with trees by the residents and serving as a common space. It accommodated many functions such as a play area for children, a place for outdoor household activities and generally a pleasant shaded space for the residents. Despite the poor physical planning principles, each beneficiary had about 8 decimels of homestead land, sufficient for a backyard for each house, where additional ancillary buildings could be built. Most beneficiaries had carried out substantial additions and extensions because of the availability of space. With the presence of the WVB site office and community development programme, and especially because

of the rapport between the resident WVB staff members and the beneficiaries, a sense of community had been established in the settlement.

An important creditworthy aspect of the AG settlements, shown above, was adequate homestead land - perhaps not sufficient to obviate other drawbacks, but in itself an advantage for households. Despite the original regimented layout of most settlements, there was space on each homestead plot to add new structures and to create a courtyard. If the site plans of Sudipto Chandra Ray's (HH 11) and Rohima Khatun's (HH 12) settlements are compared (Fig. 6.4.), it can be observed that in the former, because the project had generally been abandoned by beneficiaries, the original grid layout remained, whereas in the latter, because of better habitability, beneficiaries had modified their plots, adding new buildings, incorporating courtyards and negotiated site boundaries with neighbours to create small internal walkways. This shows that, if provided with the right amount of space and other necessary facilities, low-income communities are able to maximise the potential of a site, incrementally transforming it to suit their needs. This, however, does not negate the desirability of careful physical planning which might contribute to the community's endeavours.

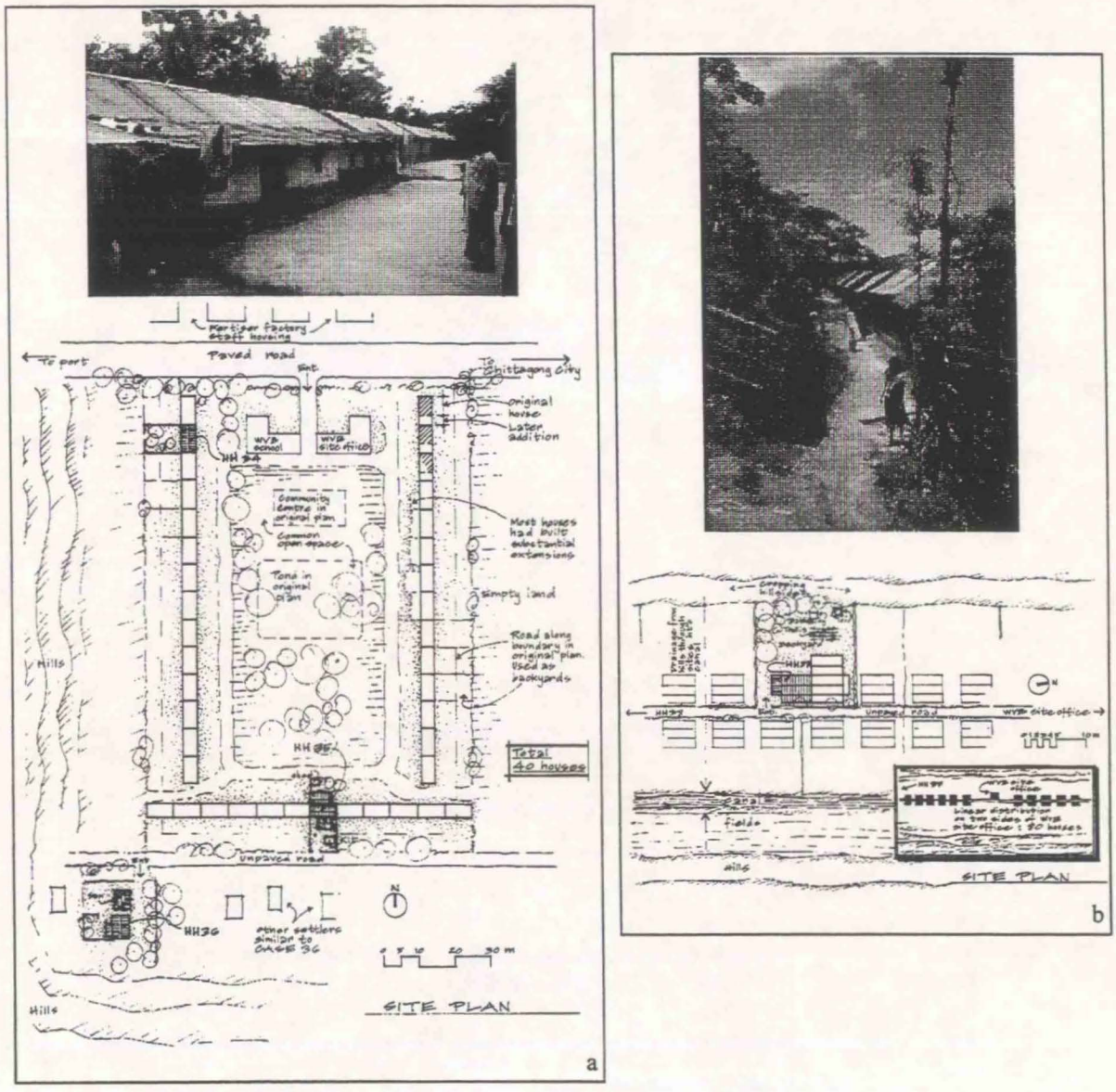
Fig. 6.4. a. Shudipto Chandra Ray's (HH 11) almost abandoned settlement
b. Rohima Khatun's (HH 12) habitable settlement



Contrasting this site with the congested GB cluster village (see Fig. 7.2.), it was noticeable that despite a suitable location, road connection and adequately raised land, because of space shortage the GB project suffered greatly. Houses were arranged around the site periphery, following the typical GB cluster-village arrangement, critically assessed by Islam *et al* (1989, pp. 34-35). The resulting open space within the settlement was cluttered up by kitchens built by individual

households in front of their houses, a result of the lack of planning for kitchens in the layout. The smoke from the kitchens blowing into the houses was a source of great discomfort, especially in those houses facing south which suffered the most; because of the prevailing wind direction, the smoke drifted directly into them. In traditional settlements, such problems seldom occur, as communities have inherent knowledge of appropriate layout of facilities within the homestead. Much from their experience can inform institutional intervention.

Fig. 6.5. a. The AG-WVB settlement in Chittagong
b. The AG-WVB settlement in Cox's Bazar



A final example of problems in physical planning of settlements is in the AG-WVB settlement in Cox's Bazar (see Fig. 6.5.). Here eighty houses were simply arranged in a linear fashion along two sides of a street. Such a simplistic linear arrangement is generally uncommon, especially in that region. As mentioned in Chapter 2, Section 2.3.1., landless households forced to squat on embankments built in a linear pattern, but this is certainly not typical of traditional rural homesteads; rather, it is a response to a crisis. The problem of water drainage in the AG-WVB settlement, discussed above, also relates to site arrangement. The addition of verandahs is a

common characteristic of rural housing, and especially given the size of houses provided in the project, this became imperative. When verandahs were built, the narrow width of the road between two rows of houses became further reduced, leaving a space of less than three metres between house fronts. This presented problems of privacy, and the verandahs were walled off, converting them into rooms instead of verandahs. Once again, as in the project in Chittagong, because this project was built from scratch on public land especially prepared for the project, it might have been possible to accommodate such household needs within the site plan had it been done carefully. A wider road was a basic requirement, especially if future penetration of vehicular traffic into the settlement, a natural outcome of the growth and densification of settlements over time, was taken into account.

These cases point to the serious need for appropriate policy guidelines in planning low-income settlements. Simply sub-dividing land and building houses, as generally practised, was not adequate. Especially the AG programme, with its extensive settlement planning projects and large amount of resources allocated for this purpose, could benefit from expert input. Despite experience gathered over more than a decade, similarly inadequate site plans were followed, and key staff of agencies involved in settlement planning had an inadequate conceptual framework in which to begin addressing problems that had emerged in projects. There is a very long road to traverse before effective site-planning of low-income settlements in Bangladesh is reached.

Vignette 6.2. The uniform settlement

During a field visit, the researcher met a GB branch manager, very friendly, helpful and knowledgeable. The manager, along with another staff member, accompanied the researcher on a reconnaissance of the area, walking through villages, familiarising him with important places and introducing him to key local people. During the walks, a range of development issues was discussed; it was evident that the manager had broad knowledge and experience relating to many of them, and the researcher was glad of the opportunity to learn new things.

The following evening, to fulfil the promise of having dinner with the manager, the researcher sloshed through mud during a heavy rainstorm to reach the village house where the GB staff members lived. If the researcher had not accidentally met Moinu Mia (HH 9) it might not have been possible to find the way to the house in the darkness, rain and mud. After dinner, sitting on the verandah, with the pitter-patter of rain on the CI sheet roof, the discussion turned again to development issues, this time about settlement planning. The manager expressed his disappointment and low opinion of GB cluster-villages, especially the local one (HH study of this research): 'If I had the chance, I would have designed it as a uniform settlement, with all the houses of the same size and type. It wouldn't be such a mess as this one'. The researcher ventured to ask if that might become monotonous. The manager said: 'Isn't that the way they do it in developed countries? How lovely their housing projects look, everything proper and standardised'.

6.3.2. Self-organised sites

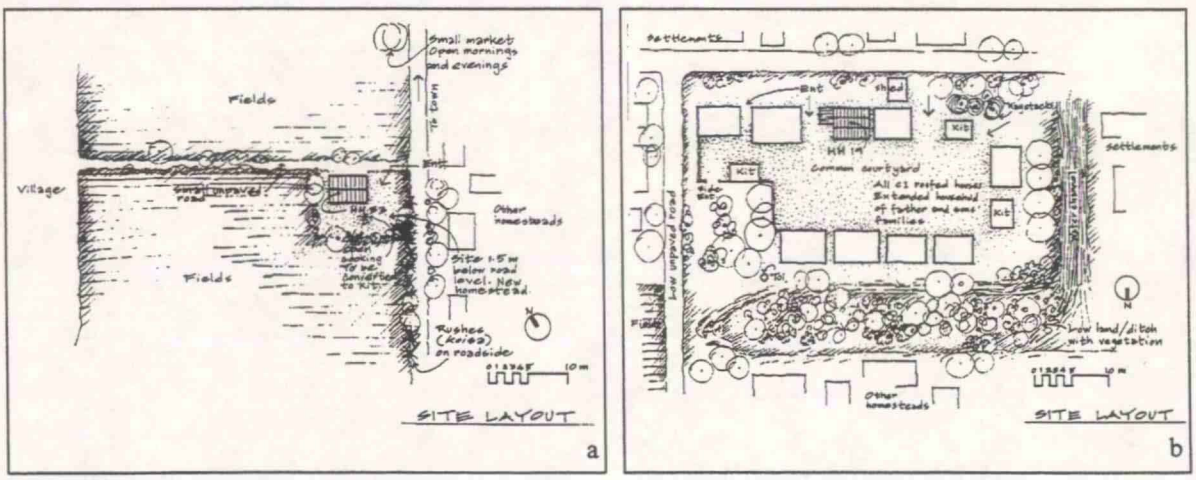
Typical traditional and vernacular settlement patterns have been discussed in Chapter 2 and are not elaborated here. The purpose of this section is to draw out some of their specific features that contrast with or are parallel to settlements planned by agencies, discussed above. It is difficult to categorise conveniently the great diversity of settlement patterns throughout different regions of Bangladesh to fit into a defined analytical framework, hence some cases have been selected and

reviewed here to serve that purpose. Nevertheless, some general features are briefly summarised as a prelude to the analytical discussion that follows.

6.3.2.1. Basic divergences of the planned settlement from the self-organised

The typical layout in traditional settlements consists of dwelling units and ancillary buildings around a courtyard, and variations on this type. However, a settlement cannot be viewed as a fixed entity in time; rather, it is part of a continuum, changing according to the growth of household and family structure, and often representing a continual process of consolidation. The households studied in this research exemplify that. Anis Ali's (HH 33) new homestead consisted of a typical raised mound surrounded by low-lying land, located as near as possible to an existing road. It had a single built structure serving as a dwelling unit; resources did not permit anything more than a few earthen stoves for outdoor cooking, made by digging into the ground. Over time, a roof might be erected over these to build a kitchen, signalling incremental growth. At the other end of the spectrum were large homesteads such as Jamal Alam's (HH 15), Rashid Ali's (HH 16) and Koruna Rani Shutradhar's (HH 19). Grown over time, these belonged to large extended families, where several households shared a common central courtyard with multiple dwelling units and other structures.

Fig. 6.6. a. Anis Ali's (HH 33) new homestead
b. Koruna Rani Shutradhar's (HH 19) large extended family homestead



A planned settlement differs from this typical accretive process in two main respects. Firstly, it attempts to construct a community from scratch by bypassing earlier stages of settlement formation. This might not necessarily be a fault; if conditions for incremental expansion are incorporated, it may allow households to achieve a degree of autonomy akin to that in self-built settlements. Secondly, at least in most of the case study planned settlements, households not related by kin were assembled together on the same site; this community of strangers was often inserted within a wider existing community. The potential for disharmony, instances of which have been presented in the preceding section, is apparent.

6.3.2.2. *The linear settlement as an unprecedented response*

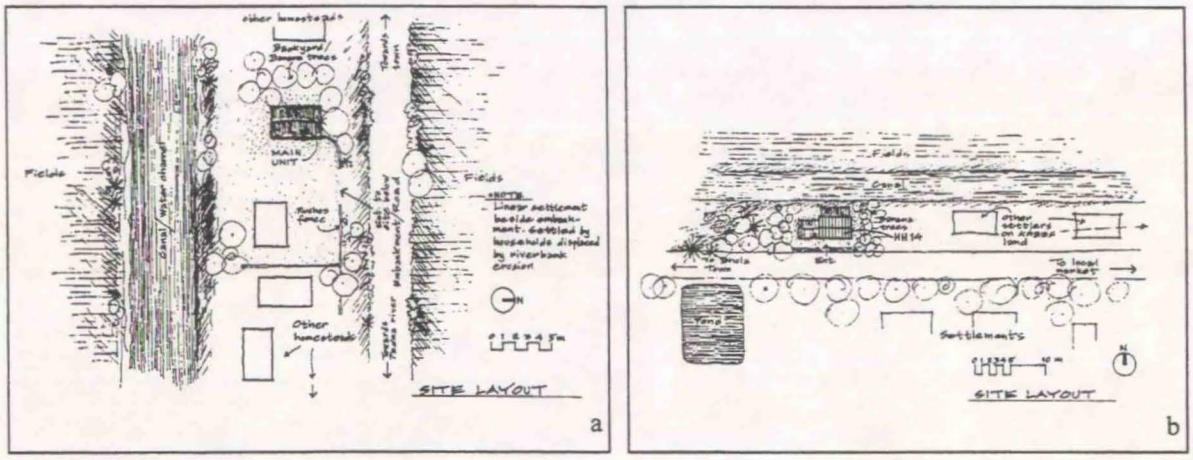
Even though they have many positive aspects, it is important, however, not to romanticise self-built low-income settlements. Changing socio-economic and environmental conditions have brought about major changes that challenge many traditional processes. Some of these changes have compelled unprecedented settlement patterns, inconsistent with previous traditional ones. An example is the linear settlement established on or beside embankments by destitute and landless households, often resulting from loss of land by riverbank erosion, but more generally a consequence of poverty. Such a household was Sharmila Begum's (HH 10), semi-nomadic, forced to move from place to place in search of a dry site in a flood-prone region subject to continuous land formation and erosion. With no land rights, always under pressure of eviction, Sharmila lived in a small single-roomed structure with her family, carrying out household functions there or outdoors. Expressing the constraints of her situation, she said, 'What can we do, even if living in this small single room is difficult?' On this site, where Sharmila had managed to find temporary security, during the dry season her house was lowered next to the canal, but during the rainy season when the canal flooded, the house had to be lifted upon the embankment road. In an attempt to retain a semblance of dignity, a makeshift screen had been erected for privacy from the road, but that had to be dispensed with when the house was moved up on the road in the forthcoming wet season. Public and private realms would then merge. The modesty of women and privacy by domain division in traditional rural homesteads was unattainable for Sharmila. In a long row, with the canal on one side and the embankment road on the other, many other households in a predicament similar to Sharmila's lived in this transitory settlement. 'How can we plan for a different and more stable future? We don't have the money for that', was Sharmila's repartee when asked about her future plans.

The GB cluster-village discussed in the previous section was an attempt to prevent households from declining into a position such as Sharmila's after they had lost their property in riverbank erosion. However, those households were in a generally more privileged position by virtue of their previous ownership of land and assets that had enabled them become GB borrowers in the first place. For example, Moinu Mia (HH 9) claimed that his extended family had lost property exceeding a million Taka in value. Because they were existing borrowers with a good loan repayment record, GB was willing to advance large loans to them to pay for land and new houses to establish a cluster-village (Tk 8000 for land and Tk 12000 for house per household). It was not possible for Sharmila to seek such rehabilitation from the GB because of her greater poverty, although she might be eligible to apply for the AG programme if one was implemented in her area. Speculation on the success of that application suggests variability of outcome.

Although living in a linear settlement similar to Sharmila's, Kajol Mia's (HH 14) household was in a better position. The canal next to his settlement did not flood the site. The part of Bhola island where the settlement was located was generally less flood-prone than the relentlessly changing floodplains where Sharmila lived. Kajol had even obtained a house with RC posts and CI sheet from JBP, and had built extensions to it, indicating his position of secure tenure. He did not fear

eviction. Although without any formal land rights, his position had been consolidated by patronage from the local UC chairman, allowing Kajol's and other households to establish the settlement.

Fig. 6.7. Linear settlements of: a. Sharmila Begum (HH 10) b. Kajol Mia (HH 14)

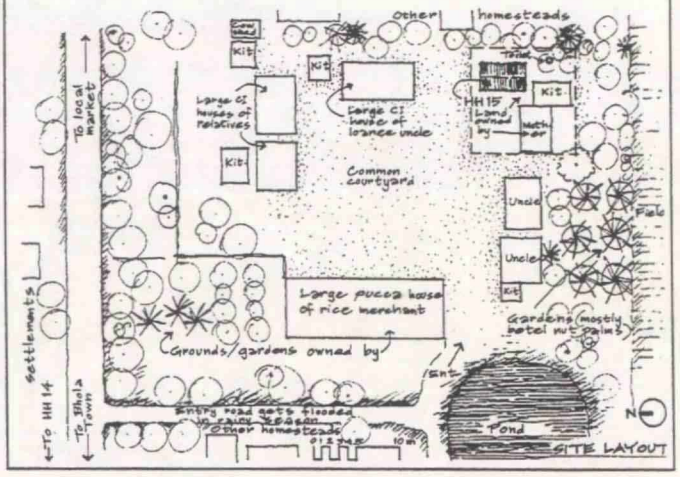


6.3.2.3. Patronage links and household networks

Kajol Mia's (HH 14) household points to the importance of social networks such as vertical patronage links, a crucial non-material resource for low-income households. In the absence of adequate formal or institutional intervention, such links on an informal basis allow households to advance survival strategies and to meet basic needs such as land and housing. Consolidation of Kajol's position was possible because of the sympathy of the UC chairman, but because of rapid consolidation within the chairman's office term, the settlement had achieved a standing that would make it difficult to carry out eviction in the future.

Patronage also works on the level of the extended family, again as an alternative to institutional or state support. There is often differentiation in economic profile between households related by kin and comprising a large homestead, and patronage is a function of this differentiation. Such a homestead is typically arranged with houses and ancillary buildings of individual households bound together by a central commonly shared courtyard. Ownership of adjacent plots of land by each household, with a commonly owned courtyard, is a typical homestead pattern, developing over time. Fragmentation and separate ownership of contiguous homestead land, often originally owned and established by a patriarch, occur through inheritance. Sometimes the process is initiated on a small piece of land and gradually more surrounding land is acquired. The patriarch establishing a new homestead is often an individual for whom there is no longer a place on his familial homestead and hence is compelled to move to establish his independent homestead. The fresh homestead of Anis Ali (HH 33) with its minimal facilities, mentioned above, was such a case; Anis moved with his household when space grew constrained on his mother's homestead, and the possibility of his inheriting land was negated by the precedence of older brothers and lack of sufficient land to divide among all brothers.

Fig. 6.8. Large extended family homesteads such as Jamal Alam's (HH 15) allow for inter-family patronage links



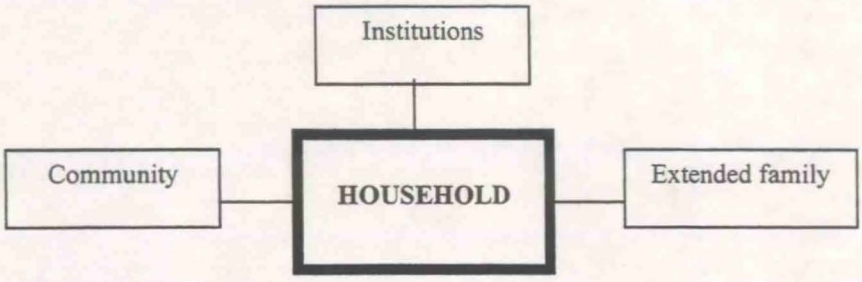
Representing a different development stage was the homestead owned by Koruna Rani Shutradhar's (HH 19) father-in-law. He had originally established a small homestead, but with the growth of his family and no surrounding land to expand the homestead, and with no desire to split up the extended family, his household, together with those of his eight sons, bought a larger piece of land in the same village and re-established a homestead. Upon inheritance, this land would be divided among all eight brothers, but over the next generation Anis's strategy might have to be adopted. Koruna's household derived support from economically better households within the homestead. Her brother-in-law, Nogesh Babu Shutradhar, living next door in a large CI sheet house, was her immediate patron: the occasional comfort of the electric fan, shelter during storms, labour contribution during house construction were some manifestations of deeper patronage networks between the two households, as well as across the homestead. Several other cases of similar vertical patronage were recorded during fieldwork, such as Jamal Alam's (HH 15), an example of establishment of a homestead perpetuated by patronage links. He established a separate household on his widowed mother's land next to her house, acquired loans for house construction and other purposes from a neighbouring uncle on the same large homestead, and had accommodation for his overnight guests in the same uncle's house, in addition to other forms of support from other households within the homestead.

Although planned settlements might not allow households to benefit from such patronage links within the homestead or immediate community of the settlement, livelihood strategies of households might propel them to seek patronage from the wider community, or as in Kajol Mia's (HH 14) case, from beyond the sphere of village community. The search for such linkages could be a basis of attempts at support by agencies as a surrogate version of traditional networks. For the disenfranchised, such as Sharmila Begum (HH 10), the embankment dweller, the possibility of support from the immediate settlement of similarly impoverished households was minimal. Reliance on institutional patronage was often also tenuous. Some, such as Shamila, with her better-off brother in a different village advancing small loans to tide her through crises, were slightly more fortunate within this settlement of underprivilege.

An inversion of patronage within homesteads can be effected by migration, another phenomenon that has brought about hitherto unforeseen changes to traditional rural settlements. For example, Rashid Ali (HH 16), originally the founder, main breadwinner and decision-maker of the homestead, had partly conceded his patriarchial responsibilities to his two migrant sons who sent

him substantial remittances, especially his mason son who lived abroad in Singapore. Even before he migrated, he was instrumental in manufacturing RC posts for Rashid's house, bringing his experience as a mason to guide the house design. In the absence of an institutional support system for the low-income elderly, such reversal of responsibility within the homestead is typical. Thus the homestead can be viewed as an entity founded on a dynamic pattern of cross-linkages of support mechanisms of a changing nature over time, with an orientation towards vertical class-based support from wider arenas beyond the homestead. Fig. 6.9. represents graphically some of the basic patronage linkages and social network options that might be available to a household. As represented in the figure, linkages with the community and extended family are generally lateral, although elements of vertical patronage may also be present. Linkages with institutions are usually vertical, as shown, despite recent attempts at participatory development by agencies. The characteristics and nature of links becomes altered or diluted when the kin-based homestead is replaced by the attempt by agencies to replicate it artificially by congregating unrelated households within the same compound. The problem of privacy, often fomenting conflict, becomes more pronounced in these artificial settlements. There is such friction in self-built settlements also, as reported by Jamal Alam (HH 15), when he described the confrontations with his brother sharing with him his mother's house, leading him eventually to establish his own adjacent household. Nevertheless, the norm is as Koruna Rani Shutradhar (HH 19) depicted it: 'Sometimes we fight, then reconcile our differences. We try our best to live in peace with each other because we are one big family'.

Fig. 6.9. Basic household patronage links and social networks



6.3.2.4. Water and sanitation in the self-built context

Once it was possible to rely completely on natural water bodies as sources of household water supply and fields as a domain for discarding bodily wastes, allowing a partial symbiosis by fertilising crop-yielding acreage. With densification of rural settlements, such a human-nature relationship has been affected; social power and usufructuary privileges over land and water have been curtailed where possible; whether these resources are available proximally is another matter. On the other hand, only 3.4% of the rural population had flush toilets and an overwhelmingly great majority used pits without sanitary toilets with a water-seal (44.5%) or defecated in open areas (39.7%) according to recent estimates (BBS 1997, p. 151). The risks this presents in dense settlements, many subject to regular flooding, is obvious. Major problems of sanitation in low-

income settlements in Bangladesh have been documented in a study by Hoque *et al* (1994), and many of the observations of that study are consistent with findings of this research.

When the research team visited Jamal Alam's (HH 15) house, it was so odoriferous and strewn with excrement at its rear that it was impossible to measure the length of that side. Because of limitations of the site, there was no alternative but to place the latrine on the south of the house; thus the southern breeze carried the offensive odour continually into the house. After sometime, the latrine became unusable, possibly due to poor maintenance, hence it was adandoned and open spaces around it began to be used for defecation by household members. It was astonishing how Jamal's wife Samira could cook in the kitchen adjacent to the outdoor 'toilet' area. Perhaps the researcher's reaction was typical of an outsider; household members appeared completely immune to the wafting odour. Maybe their life of hardship rendered such preoccupations trivial.

Jamal originally obtained a sanitary pit-latrine from JBP, but according to him it 'broke'. However, he was sufficiently resolved to improve the sanitation of his household to buy another latrine from Bhola town. Within four to five years of use, it had filled up, resulting in the condition at the rear observed by the researcher. This indicates the main problem with pit-latrines: unless diligently maintained, once the pit fills up, it presents the exceedingly repulsive task of removing the toilet slab from above the pit and placing it over a new pit. Hence abandoning it appears a better option to most households, eventually resulting in a health hazard.

Water-supply in settlements presents another serious health and environmental problem. Piped water from a central source is limited to urban areas in Bangladesh, and given national resource constraints, it is not foreseeable that such an amenity will be widely extended to rural areas in the near future. Contaminated natural water bodies are an obvious risk to a large proportion of households compelled to rely on them. Even if households are aware of the benefits of drinking boiled water, scarcity of fuelwood means that for low-income households, cooking food assumes greater priority. The option of access to or ownership of a tubewell is limited to a lesser proportion of households, even given the generosity of many households in sharing their tubewell. In addition, in the drier north-western parts of Bangladesh, due to the extensive exploitation of sub-soil water for agricultural irrigation predominantly and tubewells partly, the danger of arsenic contamination of tubewell water has become widespread; it was estimated in 1997 that more than 50 million people were at risk of arsenic poisoning and large numbers had already been affected (Alam 1997, pp. 6-8; Gough 1998). Given the continuing expansion of commercial agriculture, that the phenomenon might spead to other parts of the country appears to be a reasonable assumption. Arsenic poisoning of sub-soil water presents a complex problem, and even though research is being carried out to devise methods to overcome it, it seems that there are as yet no readily implementable remedies (Ahuja 1998).

The typical image of Bangladesh propagated by media coverage of floods suggests a context with abundance of water. It is less publicised that there are also some hilly areas, albeit occupying

much less land area than the floodplains, where water supply is scarce. In addition to these areas, in many coastal villages local water sources consists of brackish water and access to freshwater sources is severely limited. The researcher was involved in a rainwater collection and storage project to be implemented in these areas, which might offer a solution to the problem of water supply. Discussion of this project is outside the scope of this research, except to mention that such projects, as most other innovative ones, although promising, would have to be assessed in the light of household and community needs, capabilities and aspirations.

Notwithstanding many rapid changes, a cultural propensity to resist new amenities often co-exists in this transforming populace and its settlements. Rashid Ali (HH 16), despite owning a tubewell, preferred from habit to bathe in a pond, oblivious of potential hazards of sharing this small stagnant waterbody with related and unrelated members of the community, in the company of the detritus and sedimentation of years of washing clothes, utensils, etc. Occasional stealthy dips in the pond by wandering animals were not uncommon, nor was the disposal of waste into it by the unscrupulous. Rashid was more than sixty years old and maintained good health despite his inclinations, perhaps an indication of his strong acquired resistance to ailments or infestations that might have ravaged the more vulnerable urbanite. On the other hand, in the exceptional household of Lota Bala (HH 28) (see Vignette 4.7. in Chapter 4), Lota's skillful husband himself fabricated a sanitary toilet and rings for the pit, and the household carefully maintained and used the latrine, an adoption of new habit by self-initiative.

For most households, recourse to use of a pond or similar waterbody is necessitated by lack of or insufficient amenities. Anis Ali (HH 33) had no amenities on his fresh homestead surrounded by fields, nor a willing tubewell sharer in the locality. In Koruna Rani Shutradhar's (HH 19) large homestead of nine households there was only one tubewell. For the very poor, seeking patronage in an ever-tightening landscape of enclosure is the only option. Kajol Mia (HH 14), living by the steep undescendable bank of a canal, was fortunate that he at least had permission from the owner of a local pond to bathe there.

These accounts serve to illustrate the range of problems relating to basic sanitation and water supply in self-built settlements. Such problems perhaps present the real challenge to institutional intervention to improve the quality of life in these settlements. The problems persist, perhaps in different forms, in both planned and self-built settlements.

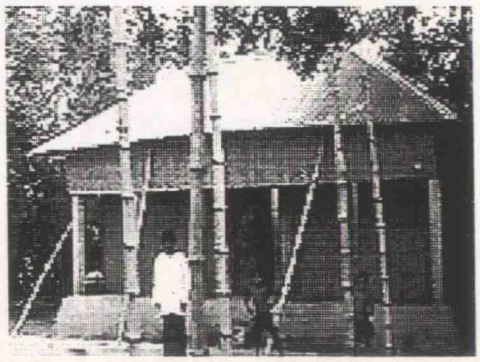
6.4. 'IMPROVED' CONSTRUCTION AS A DESIGN ASPECT

Empirical findings from this research and additional studies show that three main parts of a building are important in understanding design concepts relating to the diversity of building materials and construction technologies. Firstly, the structural support system, mainly a post-and-beam system, utilising a range of types of posts. Secondly, walls; except for rare cases of *pucca*-type construction, load-bearing walls with foundations were generally non-existent in most low-income rural housing projects. The few cases of monolithic, load-bearing earth walls within the research sample have been subsumed under wall materials. Thirdly, manufactured roofing materials. Because natural vernacular building materials have been discussed in Chapter 2, and since this study is concerned with the changing aspect of rural housing brought about by agency action, this section mainly reviews manufactured and innovative/non-traditional materials and construction. Natural materials are discussed only in relation to these and not separately.

6.4.1. Innovative structural elements

Traditionally, rural houses utilised bamboo and timber posts. Because of the diminishing supply, increasing prices and relatively shorter life of these natural materials, many agencies promote the use of posts made of manufactured materials such as RC or metal, discussed below. Also discussed is an example of 'flood-resistant' housing built on stilts.

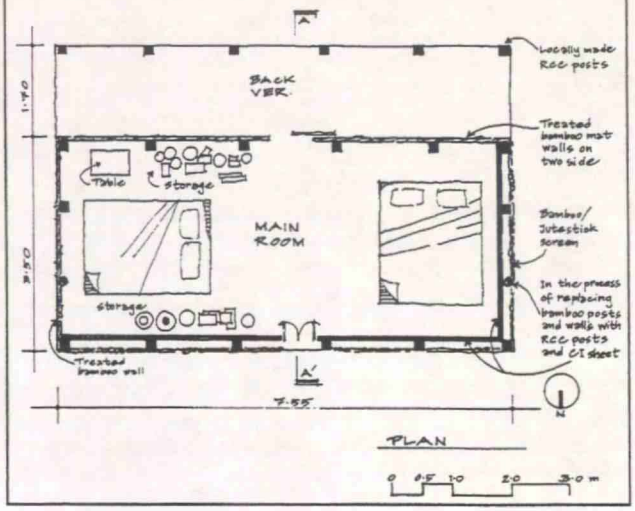
Fig. 6.10. A GB house; note the RC posts at the corners



6.4.1.1. Dissemination of RC (reinforced concrete) posts

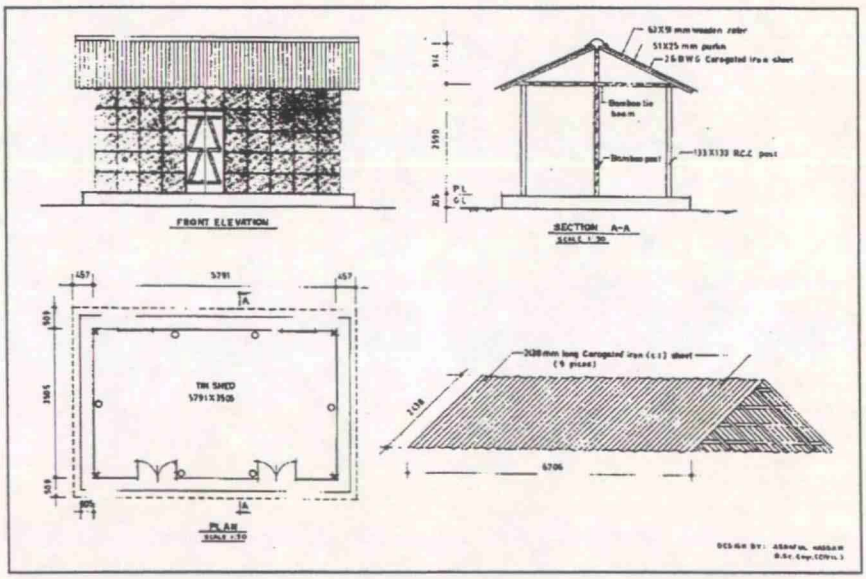
Although the concept of RC posts has been introduced and followed by agencies (the GB possibly being its original proponent after the floods of 1987-88), as mentioned in Chapter 5 (Sections 5.3.1.2., 5.4.2.4.) it has had widespread replication by the informal sector and adoption by a section of the rural populace, especially in places with better connections to urban areas. The Grameen model consists of four RC posts (Islam *et al* 1989, p. 43), with additional posts of bamboo (or timber). The idea is that the RC posts at the corners of the house keep it stable if the bamboo posts decay; the latter can be replaced when opportunity permits, without the household living in a hazardous structure. Some agencies, such as Proshika, JBP and Caritas, employed six RC posts with the advantage of greater sturdiness, but this is obviously at a higher cost. For households that can afford it, such as Rashid Ali's (HH 16), the ideal is to avoid bamboo posts altogether and build entirely with RC

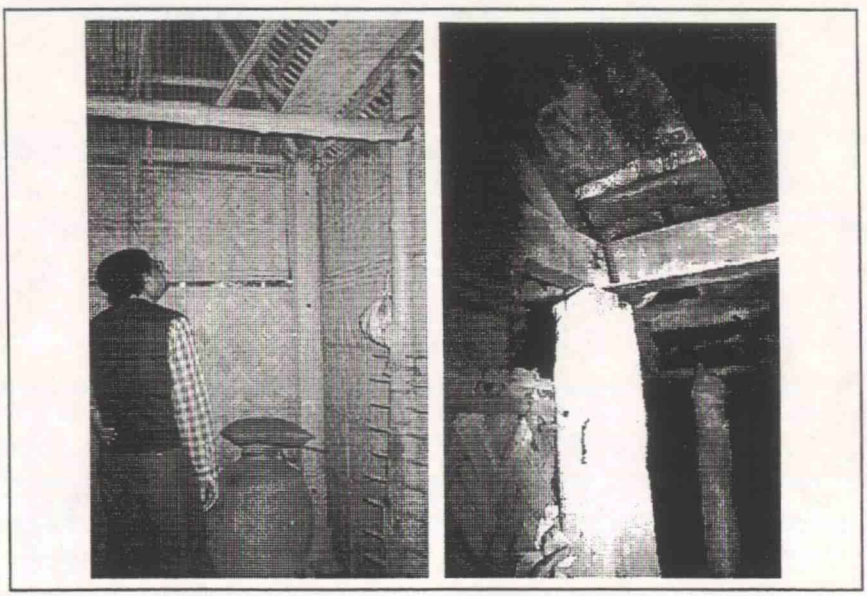
Fig. 6.11. Rashid Ali's (HH 16) household avoided bamboo posts and used only RC posts



posts. Rashid replaced all his previous bamboo posts and instead used twenty RC posts in his relatively large house (including verandah), contributing to its comparatively high cost. Similar aspirations to avoid bamboo posts because of their relative lack of durability was evident in several instances, such as Lota Bala's (HH 28) household, in the process of incrementally replacing all bamboo posts with RC. The main room of the house already had eight RC posts and Lota expected that they would gradually replace the four existing bamboo posts. Hence it appears that RC posts fulfil a popular need for durable building materials in a context of declining natural building resources and the increased pressure on household resources for their frequent upkeep.

Fig. 6.12. The GB basic house and RC post details *(excerpted from Islam* et al*, 1989, p. 43)*

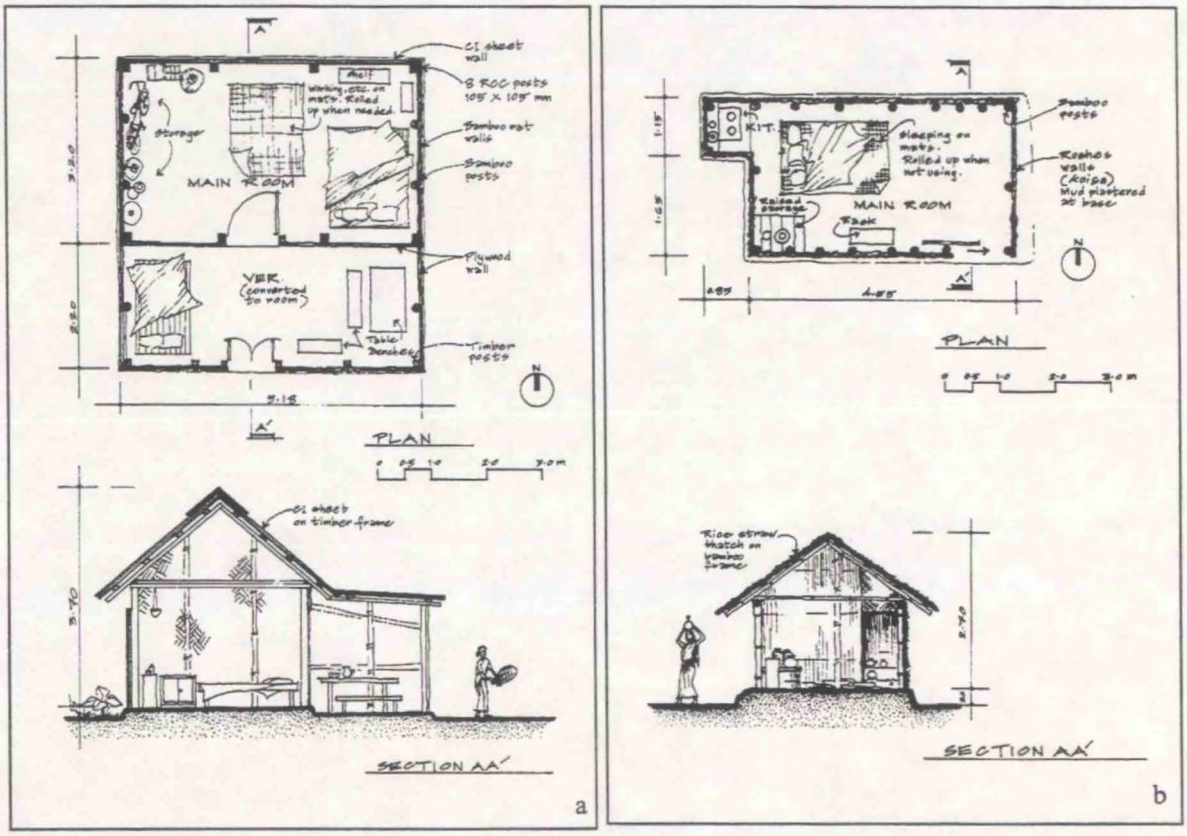




This popularity deserves analysis in terms of cost. Mofizul Haq (HH 31) spent Tk 600 on 7 bamboo poles (Tk 85/pole) to make twenty posts and the roof frame of his house. For a house of comparable size and built about the same time, such as Lota Bala's (HH 28), eight RC posts cost Tk 2300 (about Tk 287.50/post), and together with four additional posts to replace all bamboo posts, the cost would amount to Tk 3450, six times more expensive than Mofizul's bamboo posts

and roof frame. This is clearly unaffordable for very low-income households; many cannot afford even bamboo posts, let alone RC. Unless combined with some form of credit or provided as welfare, RC posts remain beyond reach for such households.

Fig. 6.13. Lota Bala's (HH 28) house (a) and Mofizul Haq's (HH 31) house (b)



In the broader national context, Bangladesh produces very little cement and steel reinforcement rods; they or the raw materials for their production are mostly imported (SKAT 1991, pp. 53-54, 58). Thus increased use of these products imposes pressure on national foreign currency reserves. In addition, with regard to the need for import in situations similar to Bangladesh's, Wells (1993a, p. 90,) has pointed out that 'cement-based materials involve a high embodied energy' (*op cit*), partly due to their transport. On several occasions during fieldwork, it was pointed out that the local supply of cement and rods was erratic, the quality was dubious and prices were higher than in urban centres. Nonetheless, in a developing country such as Bangladesh, it is reasonable to expect an increasing use of such products, and such problems might not be a sufficient deterrent to their adoption by local administrations and households. It is practical to envision limited but expanding use of these products by maximising their potential, without compromising quality or performance, instead of denouncing them.

A typical argument often encountered was that even though RC posts require a larger initial investment, they are more economical over the long term than bamboo posts because of their relative durability. Assuming a high annual inflation rate in the price of bamboo of 20% (consistent with recent figures), and considering that bamboo posts generally require replacement every five years, in twenty five years (assuming that a RC post would serve adequately for about

this period) the money spent on bamboo over this period would be about 3.6% more than the cost of RC posts of Lota's house (see Table 6.3. below). This price diffential may appear even less significant if it is noted that it has been computed at 1997 prices, when Lota's house was built, without taking into consideration inflation in the price of cement, rods, etc. In addition, the bamboo post considered here is of good quality and of the more expensive type. Thus that economic-over-the-long-term argument does not really hold water.

Table 6.3. Cost comparison of RC and bamboo posts based on Lota Bala's (HH 28) house *(costs in Tk)*

Cost of bamboo post at 1997 prices	After 5 years (new post at 20% increased cost)	After 10 years (20% increase)	After 15 years (20% increase)	After 20 years (20% increase)	After 25 years (20% increase)
30.00	36.00 Money spent: 36.00+30.00 = 66.00	43.20 Money spent: 43.20+66.00 = 109.20	51.84 Money spent: 51.84+109.20 = 161.04	62.21 Money spent: 62.21+161.04 = 223.25	74.65 Money spent: 74.65+223.25 = **297.90**
Cost of RC post at 1997 prices	Cost differential of bamboo post over 25 years		and RC post		% of cost differential of bamboo over RC
287.50	297.90 - 287.50 = 10.40			**3.62**	

The basis of popularity of RC posts is not its economy; it appears primarily a socio-cultural phenomenon associated with human aspiration. Natural materials such as bamboo have a low social status; manufactured and more durable materials connote higher status, and with that, associated social benefits can be derived (e.g. securing a better marriage). This popularity also has a psychological aspect: the idea of acquiring permanent and durable building components might appeal much more than the prospect of periodic upkeep of more perishable materials, appearing tedious and uncertain in the face of increasing price (one cannot predict a consistent 20% rise in cost), scarcity of adequate and good quality supply, and the various demands on the meagre resources of most rural households.

In addition to addressing the issue of diminishing natural resources, RC posts have been promoted by agencies as hazard-resistant. Even though in the GB programme RC posts are optional in earth houses, GB officials insisted upon Proshad Chandra Ray (HH 2) (who lived in an area having a tradition of earth houses) taking posts as part of his GB housing loan. He was told that, 'they would be good in floods'. The basic concept is that in floods, even though bamboo or earth walls might get damaged or swept away, RC posts would keep the roof in place; after the floods recede, households can rebuild the house simply by adding new walls. In a study of GB houses after the 1988 floods, this assumption was found accurate, although in some cases houses had tilted or settled badly (Islam *et al* 1989, p. 29); a similar observation was also made by the researcher after the 1998 floods. It is somewhat inexplicable that in the GB programme RC posts are optional in earth houses, given the preoccupation with hazard resistance; even well-built earth houses collapse in floods due to damage at the base of walls (Dunham 1989, pp. 3, 16). In any case, it was probably a blessing in disguise for Proshad that GB officials insisted on RC posts.

Another concept, reiterated in several sources as well as by agency staff, is that RC posts can be salvaged during riverbank erosion and re-used in a different location (Islam *et al* 1989, p. 36; *Mimar* 1990, p. 39). However, this was not always the case, as evidenced in the offshore island of Bhola where the Meghna river estuary has consistently eroded the north-eastern banks of the island. A JBP staff member related this occurrence in relation to houses built by his programme:

> The force of the waters was terrible! Even the embankment got eroded and breached, and the water gushed in rapidly. About seventy of the houses we had built sank in water within minutes. People managed to salvage some of the CI sheet, but most of the bamboo walls had got totally damaged. The pillars [RC posts] were too heavy to salvage. I mean, each pillar weighs about a sixth of a tonne, how would people lift them in such a crisis situation?

As Vignettes 6.3. and 6.4. illustrate, RC posts can enable houses to resist storms and provide protection (though sometimes also becoming a hazard in itself). This depends on a number of factors, such as magnitude and nature of storm, the extent of protection of the area and local preparedness. This is not the place to discuss these factors in detail. Nevertheless, it can be asserted that RC posts offer more sturdiness than traditional bamboo posts, but are not necessarily entirely hazard-resistant. They might provide a degree of protection and some advantages in the different types of natural hazards in Bangladesh, but also have their limitations.

Vignette 6.3. RC posts save lives

The May 1997 cyclone ravaged the coastal district of Chittagong. Shaheda Khatun (HH 36) recollected that dark day:

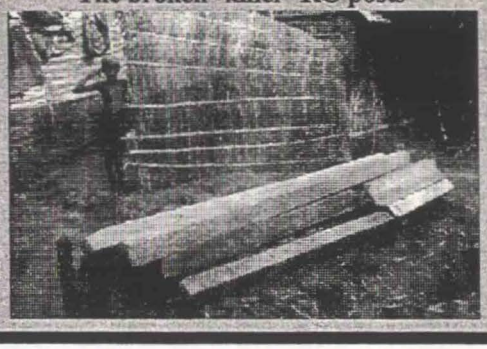
> Our house was shaking like a tree. The verandah was completely blown away. We managed to salvage some of its tin [CI sheet] roof later, but most of it was gone. The roof frame of this house has cracked in some places. The pillars [RC posts] were the main thing that saved us. If the house didn't have these pillars it would have totally collapsed.

Vignette 6.4. RC post kills woman

During a field visit to an area in Tangail district affected by the 1996 tornado, the research team came upon some broken RC posts lying by the roadside. When inquiring about them of villagers, the following response was provided:

> See this boy? He lost his mother during the tornado. They used to live in a Grameen Bank house, to which these pillars [RC posts] belonged. The tornado was so strong that the pillars broke and fell on her and killed her. This boy was luckier, he managed to escape. But not without those scars you see on his back from the falling pillars.

The broken 'killer' RC posts



One of the main problems mentioned by households and agency staff is the difficulty in rural conditions when the solid square-section RC posts are transported. Using human-powered vehicles such as tricycle carts on unpaved village roads or country boats, transporting posts to homesteads from production or supply centres and handling these heavy, precast products often present difficulties. In many cases, homesteads are unreachable by vehicles, and RC posts have to be carried manually part of the way, requiring three to four men to carry each post. Similarly, a larger workforce is required during construction. However, during discussion with a Proshika staff member, these observations were alluded to as urban and middle-

class and not pertinent to the reality of rural low-income communities: 'This may seem a problem to us, but it is normal for villagers'. Such a view is consistent with that of Moinu Mia (HH 9), a rural householder and beneficiary of a GB housing loan. Even after experiencing the difficulties of transporting RC posts by boat during the rainy season, manually carrying them about 200 metres to and from the boat, and climbing up along the slope of the riverbank with the load, Moinu was found to say: 'It is natural to face such difficulties when building your own house.' Even though most households mentioned problems during transport, quite often they did not voluntarily offer this information, but did so only when asked about it. Many of these households expressed a sense of satisfaction with the RC posts they had acquired, even when discontent with the overall housing programme; perhaps the arduous hurdles that had to be overcome was a small price to pay for this satisfaction.

Another problem is that RC posts tend to settle in waterlogged soil, noted in several studies (Islam *et al* 1989, p. 29; ITDG 1994, p. 3) and also by the researcher after the 1998 floods. The remedial action is to compact soil thoroughly, place a layer of sand-filling, then add a brick soling before placing the post. However, this is obviously at a much increased cost; for most households, simply acquiring RC posts represents a large investment, and such additional expenses might prove prohibitive. Such remedies can only be followed where funds allow it, and when households are convinced that is is worth the investment.

An important issue arises from the production of RC posts by the informal sector, in itself should be encouraging to agencies such as the GB which originally promoted the concept. It is an indication of the replicability and social acceptability of this building component. However, such informally produced posts appear similar and yet are sold at a lower price than those provided by agencies such as the GB, consequently competing with them. Households that had availed themselves of a housing loan tied to posts supplied by an agency (e.g. GB, Proshika) felt that they had incurred a loss by buying posts at a higher price. For example, Lokman Mia (HH 18), a Proshika beneficiary, expressed such a sentiment:

> We had to take those pillars [posts supplied by Proshika] because we needed the loan money. We could have got better and cheaper pillars on our own. I myself have made many pillars for other people.

However, there is a lack of scrupulous quality control in informally produced posts, and often a tendency to use less cement and more sand in the concrete mix and other ways of cutting corners. Because informal posts may not be of the high quality that agencies ensure, agencies insist on providing RC posts manufactured in their own production units under strict supervision. GB staff members strongly contest the merit of informally produced RC posts; it seems that in some cases only one reinforcement rod is used along the length of the post and in other cases wire is used for stirrups instead of rods. Informally produced posts might appear to be of the same quality as those provided by agencies, but might also wear out and crack within a short period of time. Households who opt for them believe that they have found a better bargain, only to lose out soon quite often.

However, such observations should take into account the reasons for the widespread prevalance of informal RC posts in many areas, an indication of its fulfilling local requirements despite its apparent lack of high professional standards. Perhaps the GB should begin to find ways of supporting and improving these local efforts instead of trying to supplant them.

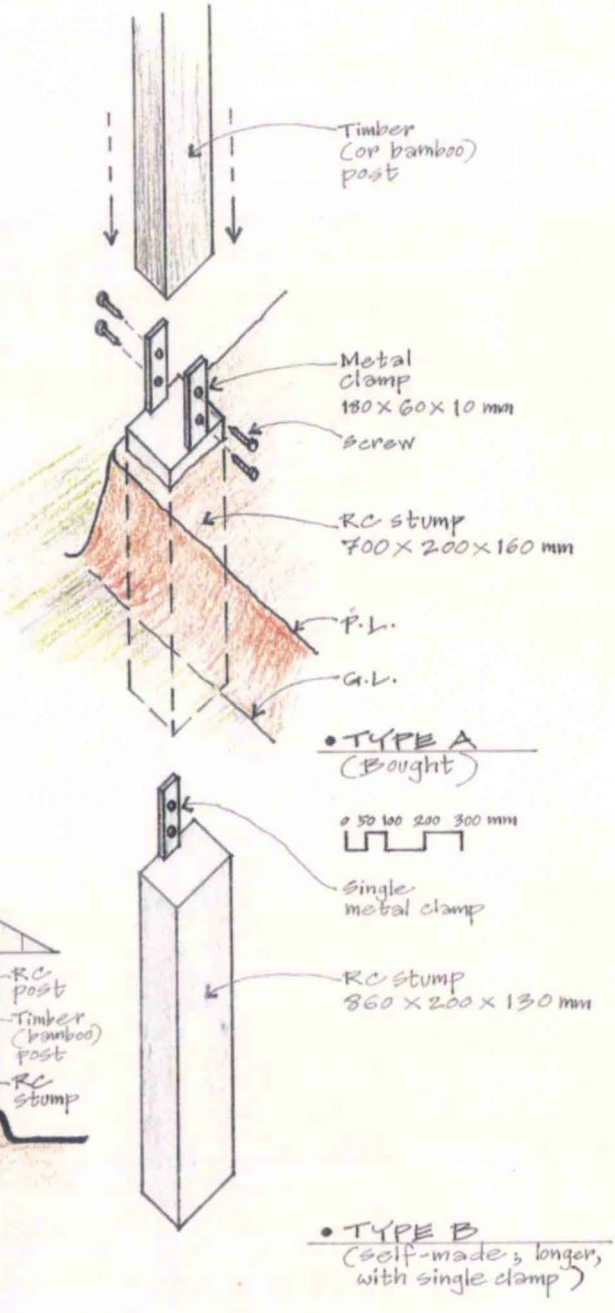
Relating to this issue of quality control, it should be mentioned that there are two main types of RC posts produced informally. The first is precast and sold by rural small scale manufacturers. Observations in the preceding paragraph are made in regard to this type. The second is produced *in-situ* by *rajmistris* employed by a household for house construction. An example of this type is in Ashim Gaine's (HH 27) household, beneficiary of an ETDA house. Subsequent to receiving this house, Ashim employed a *rajmistri* to fabricate eight RC posts for a new unit on his homestead. He and his household members supervised the quality of the posts carefully, and according to him they were of better quality and less expensive than the posts in the ETDA house. This suggests that it is more advantageous for households to opt for the second type of informal post rather than precast ones. The quality and specifications can be decided by the household according to its requirements, and scope for dissatisfaction minimised. Although this entails reliance on local or household technical knowledge, because RC post production is not very complicated, it can be learnt easily and the process does not seem to present difficulties in this respect.

A local innovation with RC should be mentioned here: *in situ* RC stumps made by *raj-mistris*, ranging from 70 to 90 cms. These have a clamp, or two in some cases, to attach bamboo/timber posts with bolts. The concept is to bury the RC stumps into the earth plinth for anchorage, with a small part with the clamp(s) above the floor level, to which bamboo/timber posts can be fastened. In houses affected by floods, sawing off the lower rotten part of posts and then supporting them on the stumps is a local technique of repair; in addition to its being a general improvement over posts directly embedded into the ground, in future floods, the RC stumps protect the posts.

However, problems remain with this local innovation. Firstly, this system of attaching posts to clamps does not offer much resistance to lateral stress from strong winds. The traditional method of embedding posts into the ground for anchorage is better in this respect and offers more resistance. Secondly, without a corrosion-resistant coating, the metal clamps are susceptible to rapid rusting, especially because of their proximity to the ground. Finally, and perhaps most importantly, a timber post with an RC stump is more expensive than a complete locally made RC post, a more durable and sturdy alternative.

When discussing this cost factor, households mentioned that the technique was appropriate for repair of flood-affected houses because the timber/bamboo posts were rotten only at the bottom and the upper part was undamaged and hence usable; besides, such a method of repair did not require dismantling the whole house. Nevertheless, despite being considered appropriate for repair of damaged posts, some of the technical drawbacks mentioned above remain.

Fig. 6.14. RC stump: a local innovation



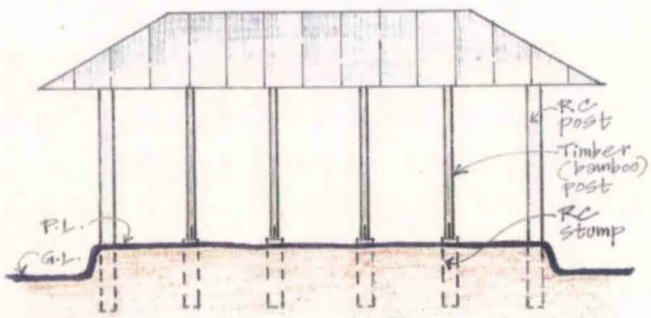
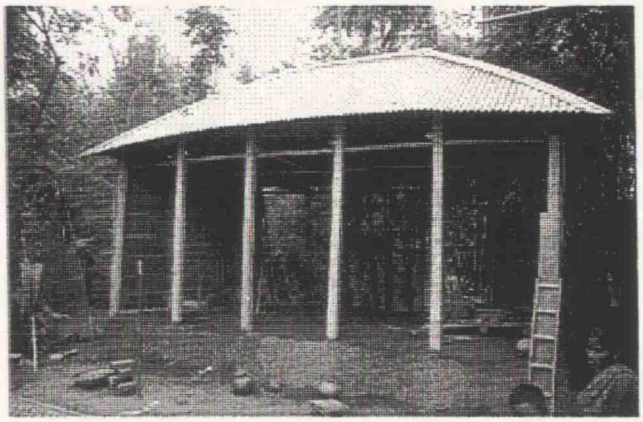


Table 6.4. Cost comparison of RC stump-timber post and RC post

			TOTAL COST
RC stump-timber post	RC stump = Tk 160	Medium price timber (hardwood) post = Tk 200	Tk 360
RC post (locally made)	20% less expensive than RC stump-timber post	41.7% less expensive than GB RC post	~ Tk 300
RC post (GB supplied)			Tk 425

In cases of building a new house, households expressed a preference for RC posts; especially in flood-prone areas, households were completely convinced of their utility. In a new house (close to the GB cluster village in Manikganj, mentioned above) being built by a household with a moderately stable income, only RC posts were used and bamboo/timber posts were avoided. In this regard, households mentioned that they would not prefer to obtain posts from the GB because of problems of transport, especially after the disruption of transport by floods. They would much rather obtain a loan and use it to make *in situ* RC posts at lower cost than GB posts. This points to the importance of allowing households to exert more control over loan utilisation, especially with respect to production of RC posts, now a building component replicable in the local context. It also reinforces the case for *in situ* manufacture, and its being to a good standard.

Fig. 6.15. New house being built using RC posts and avoiding bamboo/timber posts



This is an example of the ingenuity of rural households to find solutions to their own problems. For RC posts, the prime role of agencies was in their introduction and thereafter households managed to find ways of adapting them most effectively to their circumstances. Now the role of agencies could be to further improve the technology and its delivery mechanism consistent with the experience gathered, then promote the improved version. If this gathers momentum as the original RC posts did, it would form part of a continuum of effective long-term development.

6.4.1.2. Metal posts as an alternative

Metal posts of mild steel (MS) or galvanised iron (GI) have also been promoted by agencies as a response to disasters and diminishing natural resources. Two agency programmes in this research had utilised metal posts: World Vision of Bangladesh (WVB) and Enfants du Monde (EDM). WVB undertook a large flood rehabilitation programme after the 1988 floods and nearly 4000 houses were built using metal posts. WVB also worked in collaboration with the government's Adarsha Gram (AG) programme in building planned settlements, where metal posts had been used. Although this section deals with posts, it should be mentioned that the WVB houses were

actually steel-framed houses, with MS posts and roof frame. The basic concept was a braced and rigid framed house designed to resist strong winds. In the flood rehabilitation programme, MS tubes (circular hollow section) were used as posts and the roof frame was of MS angles. In one of the WVB-AG settlements studied, MS angle posts were used, but according to a WVB staff member, they did not fare well against strong winds; since tube posts were more resistant, they were used in subsequent projects. Another programme studied, that of Caritas, used a MS roof frame with RC posts, a variation of the WVB prototype. This is not discussed here, but in Section 6.4.3.

EDM provided more than 1100 relief houses with metal posts after the 1989 tornado in Saturia and an additional hundred houses as an initiative to introduce a credit programme. In the former type, MS tube posts with timber roof frame and in the latter GI tube posts with GI angle roof frame were used. Like WVB houses, EDM houses were designed to resist strong winds.

Fig. 6.16. MS framing in an EDM house, with struts for wind resistance

In Chapter 5, Section 5.3.1.2., it was pointed out that, unlike RC posts, metal posts and components are generally not replicable in the rural context. Requirements for specialised machinery, electricity, etc, as well as local skills, prevents dissemination of this technology among low-income communities. With hindsight, a WVB staff member mentioned that in future projects RC posts instead of MS should be promoted because 'people can then build on their own'. According to him, in the projects in Chittagong, WVB had considered using RC posts, but during implementation it was raining very hard and it would have been difficult to fabricate RC posts on site; hence MS posts were chosen. In addition, since the WVB projects were built by a contractor, it might have been difficult to control quality of RC posts during production.

Other reasons for using MS posts in the WVB project were their comparative speed of fabrication (no curing, unlike RC posts), ease in quality control, and in the Chittagong projects, availability of scrap steel from the ship-breaking industry. More importantly, timber or bamboo was considered 'environmentally unsustainable', especially in the aftermath of the 1988 floods which greatly depleted existing stock of natural resources, leading to increased price and procurement difficulty. However, this same reason was used to promote RC posts, and in this respect, there does not appear to be any comparative advantage of metal over RC. Furthermore, it can be questioned how 'environmentally sustainable' the policy of using components of imported materials is as an alternative to local natural resources which, although reduced in supply, may still have the potential for renewable production. Such reasons were not put forward by agency staff in discussion about the EDM programme; it appeared to be an experimental design strategy for

storm-resistant housing, designed by the Swiss country co-ordinator of EDM and his wife. Problems with metal components during implementation, such as difficulty in transport to remote project locations, subsequent lack of acceptance by the local community and lack of potential for local replicability were discussed in Chapter 5 (Sections 5.3.2.2., 5.3.2.3.). They demonstrate the oft-repeated mistake of well-meaning development practitioners; from outside the local community, they often do not have a complete understanding of the local context, and hence promote technology not relevant to the needs and capacities of the community.

Table 6.5. Comparison of RC and metal posts

RC posts	Metal posts
Generally replicable in the rural context.	Not replicable and difficult to maintain and repair in the rural context.
Require effort for quality control; informal sector liable to poor quality production.	Quality control easier for agencies; standardised dimensions allow production to match specifications.
Require 21 days for curing, adding to production time, sometimes delaying project implementation.	Faster speed of production; mainly a matter of fabrication from ready-made parts.
Good quality posts may serve more than 20-25 years.	Susceptible to rusting and shortened life; may not serve more than 10 years in rural conditions.

In the highly humid environment of Bangladesh, metal posts tend to rust within a short time. The part of the post embedded in the ground is most susceptible to corrosion by sub-soil and accumulated surface water. This undermines the aim of making houses hazard-resistant; because of corrosion at the base of posts, the whole structure of the house is liable to become greatly weakened. There was metal wire cross-bracing for stiffness and resistance to strong winds in both the EDM and WVB designs, but within a few years these had more or less rusted, become loose or cracked, invalidating their hazard-resistant purpose. Even when MS posts were protected with a corrosion-preventive red oxide paint (as in the WVB projects), or galvanised posts were used (as in the later EDM projects), it was difficult to prevent rusting; paint has limited durability and galvanising is destroyed by heat during welding at joints. These joints, together with places where holes had been pierced, are the first places to gather rust, thereafter gradually spreading throughout the component. In the EDM projects, after posts began to corrode, beneficiaries were instructed to adopt protective measures such as covering with bitumin or treating with oil. However, beneficiaries did not pay heed to these instructions, and EDM staff members expressed their frustration:

> We told them how to take care of their houses with low-cost techniques such as treating with tar and oil. We told them that these were their houses, they should maintain them. But they don't seem to care and are not interested in maintenance. They are just waiting for the next round of relief houses.

These observations contrasted with reports of the beneficiaries. According to Ehsan Ali (HH 20):

> The posts are buried three *haths* [about a metre] into the ground; that is where they begin to get spoilt and the rust then spreads upwards. How do they expect us to maintain these houses? We

> have to take the whole house apart, uproot the posts, treat them and put it all back together again. It's quite an impossible idea.

Thus, under these conditions, if metal posts last at the most ten years, they do not offer a significant advantage over bamboo which might require two replacement cycles during this period and yet prove less expensive. There are other methods of treatment for corrosion prevention, which, especially if adopted during implementation, may serve effectively. However, most of these would be at an increased cost, accompanied by a host of local problems.

Some of the issues arising from sale of building components provided by agencies, discussed earlier in Chapters 4 and 5 (Sections 4.4.1.2. and 5.3.2.3.), especially metal posts, should be recalled. As stated, more than half of the EDM beneficiaries had sold off their metal posts to further other household aspirations such as building a CI sheet house or meeting household expenses for weddings, medical treatment, etc. Shahjalal Ali (HH 22), as explained, sold off his entire EDM house and acquired funds towards purchasing homestead land, and built a thatch-and-rushes house on it. He now planned to save enough gradually to buy CI sheet for roofing. Interestingly, while Shahjalal sold off his CI sheet roofed house to advance other priorities, he waited for the opportunity to acquire a CI sheet roof again. It is common for low-income households to sell off CI sheet to repay debt or overcome household financial deficit (see Jansen 1986, p. 104), but Shahjalal's strategy was not that of such distress sale; rather it represented an exchange of assets according to household priorities.

The sale of metal components by beneficiaries illustrates another aspect of the mismatch between agency objectives and household needs. Banu Khatun's (HH 40) household, a WVB beneficiary of the flood rehabilitation programme, lived in an area highly prone to riverbank erosion, having a landscape continually modified by the rivers. WVB had built 800 houses there, and within eight years all the land on which the houses stood had been engulfed by water [it was not possible during fieldwork in 1997 to study at first-hand the original WVB houses because by that time they had disappeared; an earlier evaluation report found evidence of rusting of metal posts there as well (Hodgson 1990, pp. 2, 9)]. All the beneficiary households had to relocate to drier land, some squatting on public embankments or on *khaas* land. Banu said that even their present position was precarious: 'We don't own any land, we move from place to place as the rivers move'. During the 1997 field visit, it was observed that land was still being eroded as part of a continual process and households were transporting dismantled houses. When Banu's household had to move from their previous location, it managed partly to dismantle its house with the metal posts and roof frame and carry it to a new location, although in the frenetic scramble to escape the rushing waters some of the nuts and bolts were lost. However, after moving they found it difficult to re-assemble the house:

> How could we put it back together? We didn't have the necessary tools, nor did any of our neighbours. This place is quite isolated, as you can see. The nearest market is quite far, and we couldn't find any help nearby. So we sold off the metal components; we had no other use for them.

According to Banu's narrative, some of the same contractors and construction workers who had built the WVB houses were searching throughout the area for beneficiaries who wanted to sell off

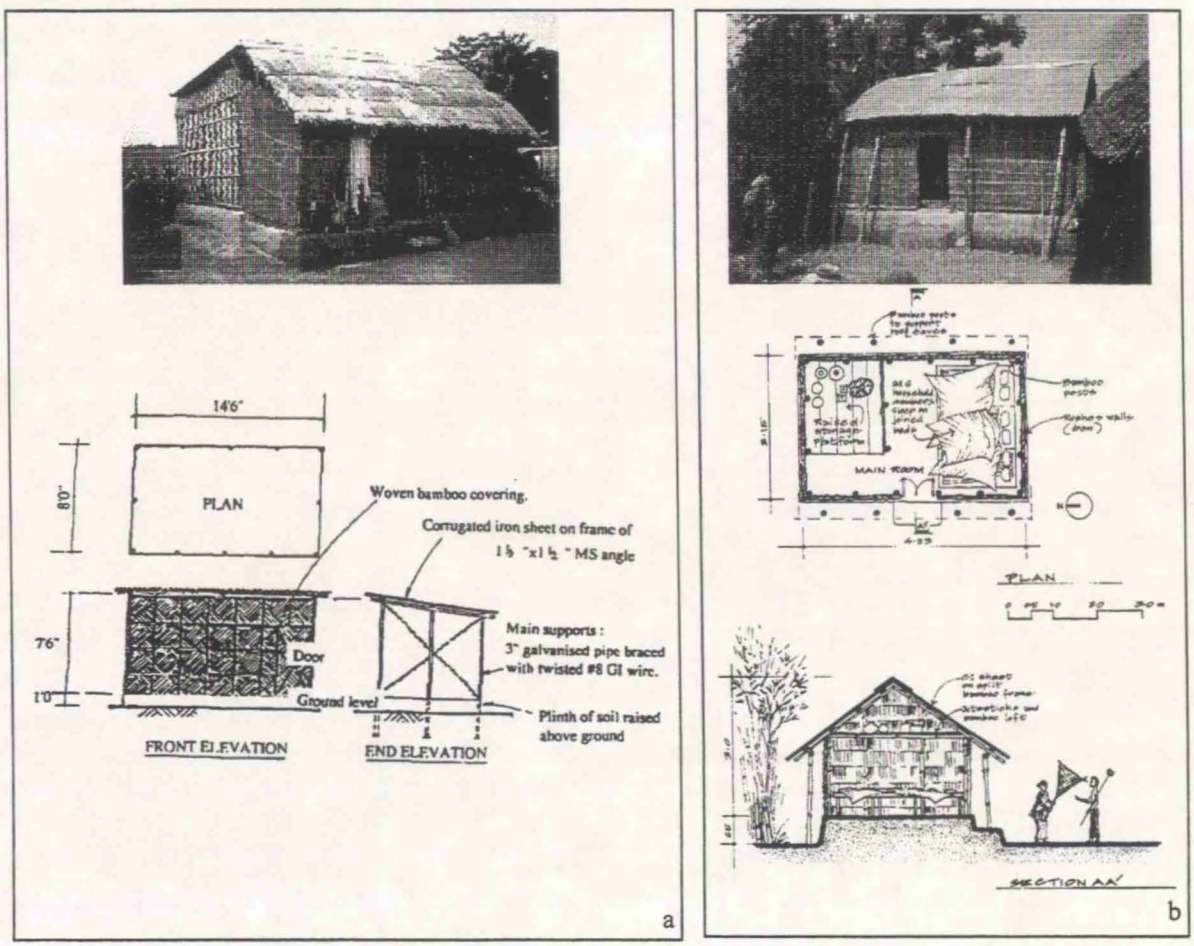
the metal components. It seems they bought these at low prices and sold them back to the original suppliers at a profit. These individuals were aware of the mismatch between agency provision and local needs, and exploited the situation for their own benefit.

When a WVB staff member was asked why metal components had been provided he replied:

> Because this is an erosion-prone area, we knew that people had to move frequently. So we provided this type of house, we thought that it would be easy to dismantle and relocate.

In the field, the opposite was found true, and shows a clear example of a gross mismatch between an agency's design intentions and the reality of poor villagers. The WVB design was prepared by an engineering firm in Dhaka in consultation with WVB staff. If the intended beneficiaries were included in the consultation, the results might have been different.

Fig. 6.17. **a. WVB house design similar to Banu Khatun's (HH 40) former house** *(front added by beneficiary)(photo: R Hodgson; Hodgson 1995, p. 156)*
b. Banu Khatun's (HH 40) house after selling off the WVB house



It should be added that none of the beneficiaries of the WVB Chittagong and Cox's Bazar projects had sold off their metal components. Possibly an active market for these products did not exist in this area. In addition, these communities were settled on more physically stable land than Banu's household. This points to the importance for pre-project context-specific studies. A standard design applied in very different locations has variable chances of success.

6.4.1.3. *Stilted houses in the flood-prone context*

Although apparently an obvious solution for a flood-prone region, houses raised on stilts are rather uncommon in Bangladesh. There are two main examples of such housing, both in response to very specific circumstances. The first is that of tribal communities in hilly regions, such as the *Chakmas* of the Chittagong Hill Tracts (Shafi 1997, pp. 926-927). The tradition belongs to a socio-cultural group different from the mainstream population, and is a specific topographical adaptation for siting buildings on hilly terrain. The second example is low-income urban communities who settle on unused water-logged land or along riverbanks. Because of the problems associated with squatting on land without legal tenure, these communities attempt to circumvent them by building upon water on stilts, instead of occupying land. In any case, these examples are rather isolated, and in general it can be asserted that houses on stilts are not a widely prevalent typology in Bangladesh. Roadside commercial buildings on stilts are common, but again, this is a specific adaptation, built to adjust to the typical road, raised above water level with water or low-lying land on either sides. Although sometimes these shops/restaurants/workshops may accommodate their workers and owners, this is generally not a housing typology and hence not considered here.

Fig. 6.18. Stilted houses of low-income urban communities

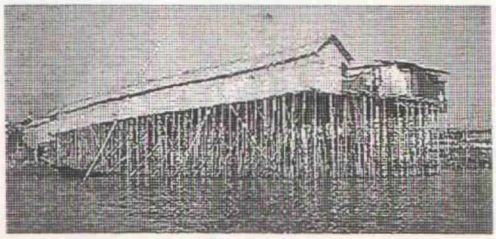
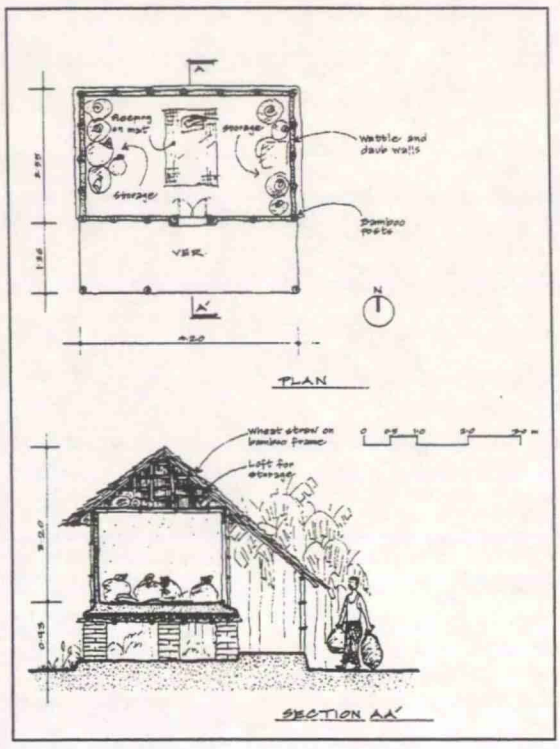
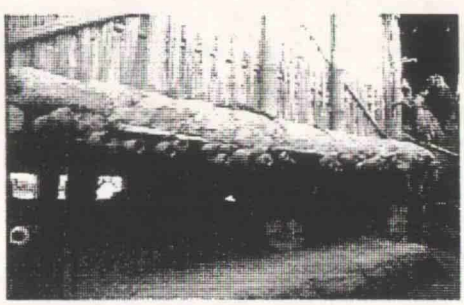


Fig. 6.19. *Gola ghor* of Jagannath Ray (HH 4)



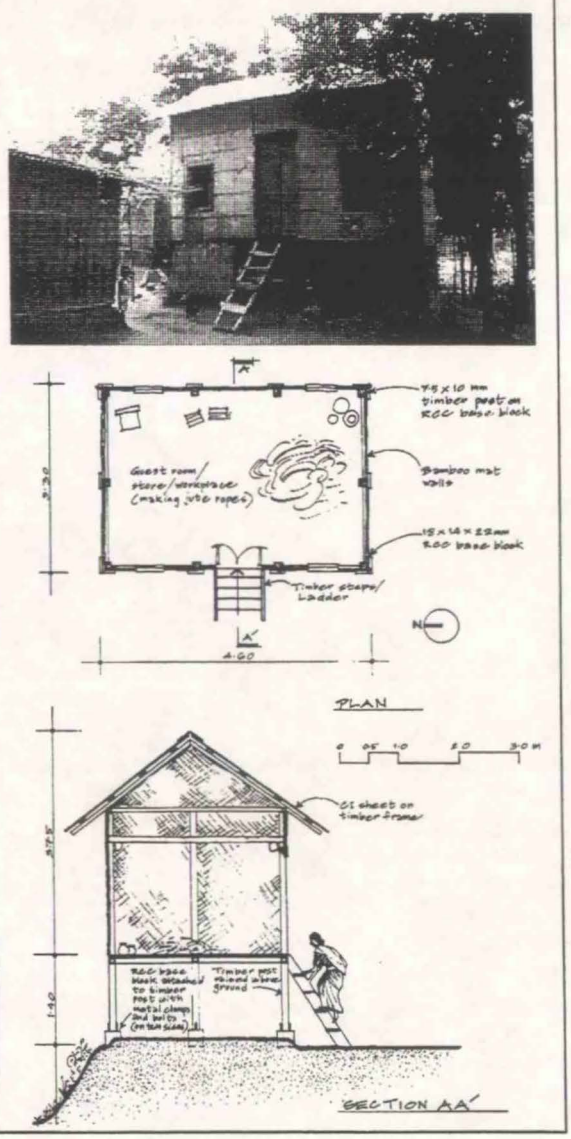


A regional and highly localised stilted building typology is the *gola ghor* (translated literally as the granary house) prevalent in Dinajpur district, such as the one owned by Jagannath Ray (HH 4). These buildings, generally raised about a metre from ground level on earthen/bamboo/brick stilts,

serve mainly as granaries in this rice producing region to protect the grain from vermin and dampness. The *gola ghor* is also a dwelling unit, because some household members live in it to guard the grain; even though it is not the main house in the homestead, it serves as an important additional dwelling unit. Jagannath's son used to live in the *gola ghor*. Although of research interest because of its unique features and hence included within the sample of this research, this, once again, is a unique example and not typical of most other parts of Bangladesh.

One of the programmes studied in this research, that of the Christian Commission for Development in Bangladesh (CCDB), provided buildings on stilts. Problems in this project, such as corruption, have been discussed earlier in Box 5.7. in Chapter 5. These buildings, of a size similar to a rural house, had been provided as community flood-shelters after the 1988 floods. Their unusual design and, as discussed in Box 5.7., their utilisation by households as personal houses instead of community buildings, were reasons for including the programme in this research.

Fig. 6.20. Stilted 'community mini flood-shelter' provided by CCDB on Vanu Akhtar's (HH 6) homestead



The first question that springs to mind is why timber stilts susceptibile to decay in water were used in a flood-shelter. According to CCDB staff, RC stilts would have been ideal except for their high cost, and the other alternative, bamboo, would not have been as durable. This is apparently an accurate assessment, but given the cost of these buildings as recorded in CCDB official documents (see Table 6.6.), RC stilts could easily have been provided. In fact, at exactly the cost of the timber stilts shown in the records, an entire building of the same size with RC stilts could have been built. It can be assumed that the high cost shown was due to corruption; villagers suggested a much lower price (consistent with the researcher's estimate), which was followed when computing costs in Chapter 4. Thus the funds actually expended could have been utilised to build more durable or a greater number of buildings if the costs of corruption were not included. It should nonetheless be conceded that timber is an expensive commodity in Bangladesh and it is difficult to find good quality timber in most parts of the country. Bangladesh is experiencing widespread depletion of tree stock and is among the countries with the highest deforestation rates in the world (New Internationalist 1996, p. 18; World Bank 1997, pp. 232-233).

Therefore the decision to use timber stilts in this context should be questioned seriously. Additionally, building on stilts necessitates construction of a raised floor of timber or bamboo, contributing substantially to cost, compared with the traditional earth plinth, usually built at very little or no cost with soil from or near the site. This is perhaps the main reason why stilted houses are not very widespread.

Table 6.6. Cost breakdown of CCDB 'mini community shelter-cum-house' *(as shown in the report: CCDB 1989, p. 16)*

ITEMS OF CONSTRUCTION	COST (Tk)
Earth cutting	27517.00
CI sheet	37200.00
Wooden pillars	60565.00
Bamboo walls	950.00
Nails and screws	9730.00
Labour cost	23456.00
Total	**159418.00**

Eight years after their construction, the CCDB stilted buildings were in a state of disrepair. Floor beams had cracked and the steel clamps holding the stilts to their concrete base blocks had rusted badly. Because the roof eaves were not extended far enough to protect the timber entry ladders, these had become damaged by constant exposure to rain. Makeshift repairs had been carried out on some of the ladders by beneficiaries, but generally the greatly weakened ladders posed a safety hazard. They had not been designed with handrails, making it difficult to climb up with even a small load. As Vanu Akhtar (HH 6) complained:

> We used to eat in there, but it was very hard to climb up with food and water. Carrying pots and pitchers in and out was really dangerous. Now that the ladder is broken, it's become more dangerous, we have stopped eating in there. I don't dare climb up anymore, I am scared of falling. Only the kids are nimble enough to go in there now.

In a follow-up field visit after the 1998 floods, it was found that the lower parts of the timber stilts had been damaged due to prolonged contact with flood water. Vanu was planning to saw off the rotten lower parts, thus lowering the building in attempting to overcome the damage. The building had served as a dry refuge during the floods, but lowering it would undermine its future capacity to do so. These observations serve to further highlight the inappropriateness of timber stilts in a flood-prone region.

Not studied in the field in this research, the Red Cross had also built houses on stilts after the 1988 floods. A report by their designer mentions how local communities were resistant to the idea of stilts because it was perceived as immodest for Muslim women to climb up into the houses (Duby 1990, p. 79). It appears that the locals also commented that 'as long as the floor platform was below the eye-level of the average man, no impropriety would be construed' (Duby 1990, p. 79, op. cit.). The general applicability of both these observations can be questioned, or at least they require clarification. Firstly, the criticism regarding impropriety was possibly made with regard to

houses open to public view, such as in urban informal settlements. Within the private rural homestead, with its typically enclosed pattern, the issue of female modesty may not be that pertinent. Secondly, in places where the flood-level may exceed the 'eye-level', not uncommon, building such houses would defeat the purpose of raising them above flood-level, which might necessitate higher buildings. Nevertheless, it must be acknowledged that these houses should provide a better degree of protection than those not raised at all.

Rejection of a new house design is often due to more complex cultural reasons than straightforward explanations. Traditional house patterns have evolved over a very long period by trial and error, to best adjust to context-specific traits. Although changing circumstances may require the introduction of new patterns, they may appear risky or threatening to traditional communities. Households might subscribe to specific preferences consistent with their existing milieu, often a basis for a vernacular sense of aesthetics. A new house type, however pragmatic, may upset such a mindset, especially if it is too unusual and deviates to a degree considered unacceptable by the community; acceptance of such a house might make a household feel like a freak within the community. Houses on stilts appear to fit into such a category. This is illustrated by a beneficiary of a CCDB stilted building, who for no apparent reason cut and removed the stilts to lower the house to ground level. When asked why he had done so, he simply replied: 'I just didn't like the raised floor'. To complete the anecdote, it should be added that CCDB took strong action against him and compelled him to raise the house again, a possible reason why other households did not resort to similar modification.

Vignette 6.5. The respectful villager

When the research team visited Vanu Akhtar's (HH 6) homestead with the CCDB stilted building, they were offered a bench to sit on. Most low-income villagers sit on mats or low stools (*pidi*); it is uncommon for them to possess chairs or benches. Such items are status symbols, and if a household possesses them, they are often reserved for visitors, especially for those who are well-off, educated or urban. Vanu's bench was a bit dusty, and not finding any spare rag at hand, she wiped the bench clean with one end of her *sari*. A member of the research team commented: 'For us to sit on a clean bench, you now have a dirty *sari*.'

Ostensibly, this indicates high consideration for the comfort of others, especially guests. However, the act may have had other facets. For example, the deference implicit in the self-sacrifice could have been induced by the presence of visitors believed to be superior - relating to class structure within Bangladeshi society. Vanu's position in society as a woman within a patriarchial structure, and belonging to a low-income household, possibly consolidated the propensity for such behaviour.

Such small acts of kindness are common in Bangladesh and are generally interpreted as generosity. Nevertheless, how often and to what extent are these acts related to social hierarchy and determined by larger processes that shape human behaviour and action? Acceptance of an unusual community building, such as the CCDB 'flood-shelter', on one's personal homestead might also have been part of such a process.

Further evidence of the lack of community acceptance is indicated by the fact that eight years after constructing the CCDB buildings, there were no examples of attempts to build stilted houses in the area. In 1996 there was an extensive flood, common in this low-lying floodplain. The CCDB buildings, remaining above flood-level, should have demonstrated to the community their efficacy in providing protection from floods. However, as evidenced from a recently completed house of

Vanu Akhtar's (HH 6) son, right next to the CCDB building, households still built as they did before: on an earthen plinth raised about 30-40 cms above ground level, not higher buildings on stilts. For another beneficiary, Alaya Khatun (HH 7), the CCDB house was an asset to be exchanged for a larger piece of homestead land, on which her household built a house on a typical earthen plinth. Households still adapt to floods in their traditional ways, as Vanu described: 'on piled up planks and logs, or on cots, waiting for the floods to go away'.

A building on stilts is also potentially hazardous in strong winds. Especially without cross-ties and bracing of stilts, as in the CCDB houses, such buildings tend to sway frighteningly during storms. According to a CCDB staff member: 'Since these houses were built by an agency, they are much stronger than regular houses and hence less prone to damage during storms'. However, because they were raised on stilts, irrespective of their quality of construction, the buildings did not appear safe to beneficiaries. As Vanu narrated: 'If there is a storm, we feel afraid that the building may fall down. It sways in the wind like a tree. We never stay in there during storms'.

Vanu had screened off the sides of the space underneath the building and used it as a dry protective place (when there were no floods) for storing fuelwood and tethering calves. To keep the space dry, it had been raised slightly by compacted earth, similar to the typical earthen plinth. Similar modifications were also evident in the other CCDB buildings. Despite all the problems with the buildings discussed above, most of their beneficiaries had demonstrated a typical pragmatism and adaptability by their modifications to these buildings.

6.4.2. Building durable walls

Traditional wall materials such as earth, bamboo and other organic materials have been dealt with in Chapter 2. In this section, alternative wall materials promoted by agencies is the principal topic; references to traditional natural materials are made within this context. CI sheet is used as a wall material as well as for roofing. For households that are relatively better off but cannot afford brick walls, a timber-framed house with CI sheet wall and roof cladding is a preferable option. Because CI sheet is more prevalent as a roofing material, and its charactertics and utilisation are quite similar in both roofs and walls, it is discussed in the section on roofing materials.

6.4.2.1. The pucca *option: brick*

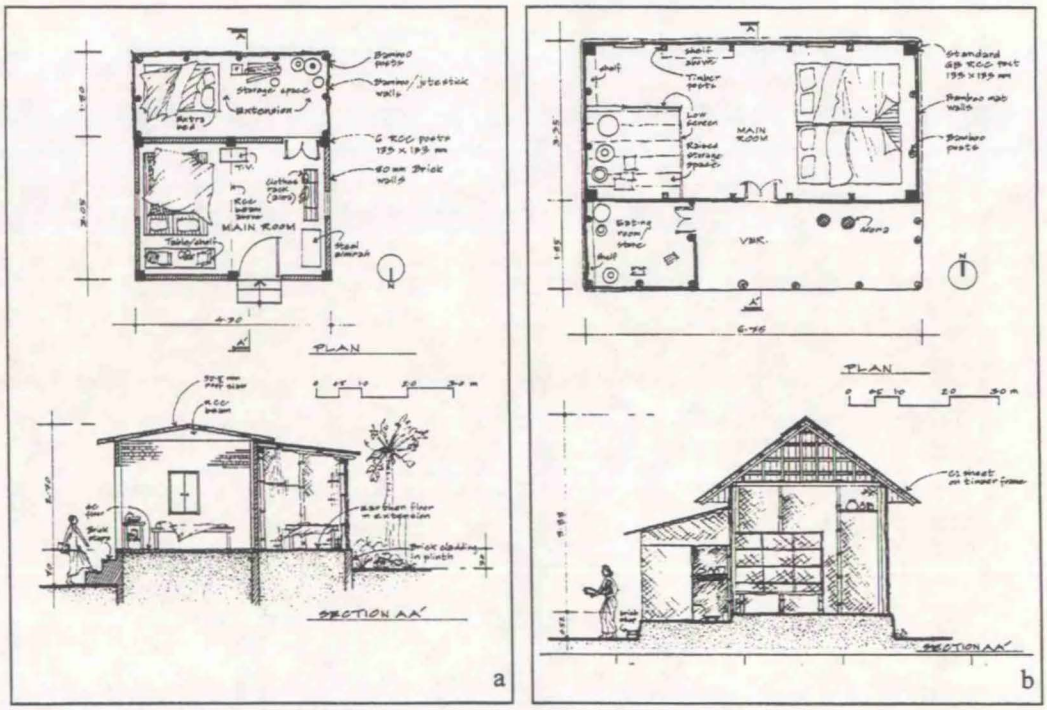
Socio-economic and environmental issues surrounding the use of brick have been discussed in Chapter 2, Section 2.4.2. Brick is not affordable by low-income households; available statistics on building materials indicate that in 1982 brick was used as a wall material in 5% of housing (BBS 1988, p. 72). The Local Government Engineering Department (LGED), often in collaboration with NGOs, has been promoting brick in housing for low-income communities, and some of these projects were studied (see Fig. 5.10. in Chapter 5, Section 5.3.2.3.). This section mainly presents and analyses findings about the use of brick.

It is necessary firstly to examine some of the LGED's assumptions when promoting brick. These assumptions address two of the issues central to this research: natural hazards and diminishing supply of natural building materials. Concerning the former, a paper by LGED design staff states their aim as: '...to provide better housing in natural disaster areas by constructing houses with improved and durable building materials' (Islam 1999, p. 53). Such buildings are certainly better able than those built of natural materials to resist natural hazards, but at a much increased cost. The paper shows the cost of a house of about 18.5 sqm with CI sheet roof, brick walls and RC posts as Tk 29525 (not clear if labour cost is included) (Islam 1999, p. 55). For a Grameen Bank (GB) house of much larger size, such as that of Naz Jahan's (HH 8) (about 22.6 sqm versus 13.1 sqm), using almost the same materials as the LGED house except bamboo mats for walls instead of brick, the cost was Tk 17300 (including labour cost; not including cost of extension and toilet); the extra cost of the LGED house is more than 70% of the cost of the GB house (cost breakdown of the GB house is shown in Table 6.7.). The GB house had four RC posts instead of nine as in the LGED house, but even if the cost including an additional five posts is computed at the comparatively high GB rate for posts, the extra cost of the LGED house is still 50% of the cost of the GB house. Or compared with the cost of Tk 1200 for the rushes and thatch house (commonly built by very poor households) of Sharmila Begum's (HH 10), in Enamul Ali's (HH 26) LGED house, the cost of 1000 bricks was Tk 1800, exceeding the cost of Sharmila's entire house. These examples demonstrate how expensive brick is compared to traditional natural building materials, and also show how unaffordable it is for low-income households. This unaffordability might be overcome by provision of credit, but as discussed in Chapter 4 in Section 4.3.1.2., even the GB-type house on credit is unaffordable for a large section of the low-income population; it is difficult to envisage how a house of higher cost could be affordable.

Table 6.7. Cost breakdown of Naz Jahan's (HH 8) GB house

ITEMS OF CONSTRUCTION	COST (Tk)*
CI sheet (2.4 m long, 21 pieces)	5600
Timber (for posts and roof frame)	7500
Bamboo walls	1500
RC posts (four)	1700
Labour cost	1000
Total	**17300**
* Includes prices of nails, screws, wire, etc	
Sanitary toilet	500
Extension by household	5000
Final cost (as computed in Section 5.6.)	22800

Fig. 6.21. The extra cost of Enamul Ali's (HH 26) much smaller brick house (a) is more than 70% of the cost of Naz Jahan's (HH 8) GB house (b)



In an LGED publication addressing the issue of diminishing natural building materials, another assumption adopts the economic-over-the-long-term argument, as in the case of RC posts (see Section 6.4.1.1.):

> Initially, these may cost a bit high [an understatement, evident from the discussion above] as compared to houses made of indigenous materials ... but as they will provide longer durability and higher stability, it will result in greater economy in cost ...
>
> (LGED 1993, Foreword)

The publication further states:

> ... actual requirement of organic construction materials is less with respect to longer span of durability of the materials ... the model houses constructed with the durable construction materials will certainly have a favourable impact on the ecology and afforestation in comparison to the houses constructed with indigenous organic short-lived materials.
>
> (LGED 1993, p. 9)

With RC posts, whether brick would have a comparative cost advantage over natural materials in the long term can be questioned, given its considerably higher price. Even if that assumption proves accurate, it was clear that the initial investment would be prohibitive for most low-income households, and at the rate of credit repayment affordable to such households, a very long repayment period, perhaps exceeding the life of the building would be required. The idea can work only through subsidy, consequently limiting it to selective provision. Such provison is associated with potential conflict within the community, as discussed in Chapter 4 in Section 4.4. on grant housing.

Even as a policy measure to reduce pressure on natural resources, there are serious limitations on brick production. The environmental impact arising from fuel requirements for brick production

has been discussed in Chapter 2, Section 2.4.2., showing a precarious situation in the supply and consumption of fuel, especially timber. Unless improved firing techniques and alternative fuel are utilised, the long-term impact of use of brick within the Bangladeshi context will remain problematic; even if such measures are implemented, it would raise product costs, further distancing low-income communities from this already expensive commodity.

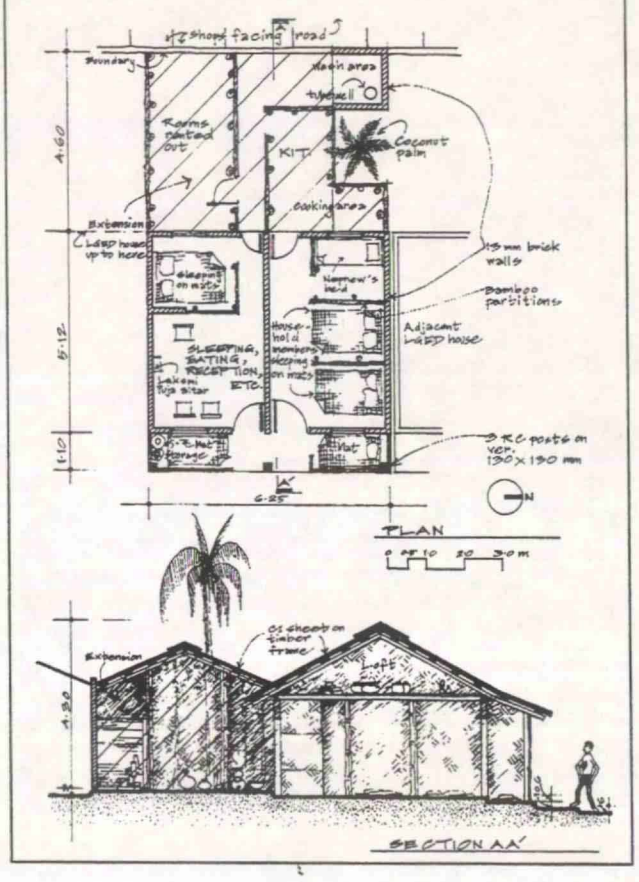
Thus the assumptions forwarded by LGED might be partially true, but on analysis they appear weak, especially in terms of affordability for the poor. Although brick production in Bangladesh is extensive, partly as a response to increasing demand for urban *pucca* construction and serving as an important employment sector (SKAT 1991, pp. 48-52, 102-120), the use of brick for low-income housing does not seem to have much prospect.

To lower the cost of construction, LGED had adopted several measures. Firstly, houses of small size, irrespective of household size, were provided. Enamul Ali's (HH 26) house was about 13.1 sqm, much less than the average 18.95 sqm for the sample of this research. This was a one-roomed house, presenting problems as Enamul explained:

> There was is enough space for all of us. Although most of our children don't live here any more, we still have a son and daughter who live with us. You can't cook or store things in such a small house. So we had to build an extension.

Porimol Kumar Jolodas (HH 39) was provided with a larger house of 31.62 sqm, but his household had eight members, and the space was simply inadequate. Hence it became necessary to build a large extension to compensate for the lack of space.

Fig. 6.22. Porimol Kumar Jolodas (HH 39) had to build a large extension to his small LGED brick house



Secondly, unlike good quality masonry construction, bricks were laid on edge, resulting in walls about 7 cms thick. To economise further, walls were not plastered. Use of a porous material such as brick in the wet climate of Bangladesh resulted in a high degree of dampness in the walls. In addition to damp walls, as Enamul repeatedly pointed out, because of the absence of plastering, there were gaps around the window frame, and, during heavy rain, water penetrated through these gaps and flowed into the interior of the house. Even in Porimol's house where the walls were slightly thicker,

and the bricks were laid flat (11.5 cms), because of lack of plastering there was the problem of dampness. In Bangladesh, to avoid dampness, exposed masonry structures are usually clad with high quality machine-made bricks. Even in thicker load-bearing external walls, normally 24 cms without plaster, plaster is applied on both the outer and inner surface to resist dampness. Hence the low standard of construction adopted in the LGED buildings seriously affected their durability and life span, and consequently undermined the basis of their promotion as mentioned above.

Thus the appropriateness of brick wall construction for low-income housing must be seriously questioned. Brick simply raises cost far above most other forms of wall construction; among all wall materials generally used in rural housing, brick is possibly the most expensive. Because of this, it can only be used very sparingly, resulting in rather unsatisfactory housing for its occupants.

6.4.2.2. The appropriateness of stabilised earth

According to a survey of 1982, earth was used as a wall material in 22% of housing in Bangladesh (BBS 1988, p. 72). There is a high level of professional interest in improving earth buildings, evidenced by extensive experimental research by the government Housing & Building Research Institute (HBRI). Given these facts, it is surprising to find very few examples of improved earth construction, and during fieldwork it was difficult to find agencies involved in construction of earth buildings. Despite the high proportion of vernacular earth housing, it tends to be localised and usually built in relatively dry or higher regions. Hence damage during floods is less (or at least less attention is drawn to it due to its localised nature), and because earth buildings are sturdier than buildings of organic materials, they resist cyclones better. Therefore agencies are not much involved with post-disaster replacement of earth housing. In addition, there are hardly any studies on supply and resource availability of earth as a building material, perhaps an indication that these factors are not as crucial as in the case of organic materials. There was only one programme encountered in this research that provided housing with stabilised earth blocks, that of EDM, and a major part of this section reviews that initiative.

Two earlier programmes of earth housing can be mentioned. In the 1960s, Christian missionaries had successfully built with stabilised pressed earth blocks in northern Bangladesh (Dunham 1989, p. 17), where there is an existing tradition of earth buildings. This indicates the suitability of local soil for this form of construction; hence its improvement did not pose a problem. On the other hand, when CARE undertook a more extensive programme throughout Bangladesh during the early 1970s, various difficulties became evident. One of these, and the principal one, was the unsuitability of the clayey alluvial soil (Dunham 1989, p. 17), typical of many parts of the deltaic floodplains. This is also the principal reason why earth buildings, especially with monolithic construction, are therefore less prevalent in the plains. The researcher has pointed out in previous publications the propensity for shrinkage cracking of clayey soil, a serious disadvantage in monolithic wall construction (see Ahmed 1994, pp. 26-27). It might be possible to stabilise clayey soil effectively with some effort, but this would require adequate soil testing, preferably in laboratory conditions, and probably comparatively expensive implementation.

When EDM embarked on its housing project with stabilised pressed earth blocks in a *chor* area in the deltaic floodplains, it used local soil. It appeared unlikely that proper soil tests were carried out, witnessing the isolated and remote nature of the project area. In any case, within a year of construction the walls of most of the houses began cracking. Because beneficiary labour was enlisted in this project, EDM staff members were able to blame the beneficiaries:

> It was their job to compact the ground thoroughly before construction, but they didn't do that. Because of the poor compaction, the houses have begun to settle and therefore the walls have cracked.

However, an evaluation of the project commissioned by EDM concurs with the researcher's supposition: the nature of the local soil was more responsible for the cracking than the standards of labour:

> Particularly in the _____ area, the ground or earth is comparatively loose. This is not very suitable for the kind of houses made of earthen walls because it creates cracks on the wall.
>
> (Uddin 1993, p. 18)

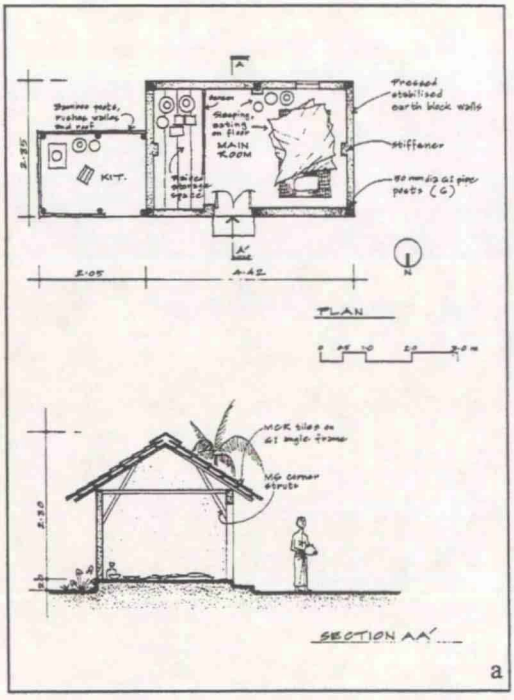
If the soil was too 'loose', it might be that it consisted of too much clay, typical of the soil of that area, with its tendency for shrinkage cracking. Most of the beneficiaries were defaulting on loan repayment, as discussed in Chapter 4, Section 4.3.1.4., and the rapid deterioration of the houses contributed to the decision to default. This led to a vicious circle: EDM had initially assisted with repairs, but because of default, ceased doing so; this lack of maintenance by EDM further consolidated the resolve of beneficiaries to default. In general, the poor performance of earth block walls resulted in beneficiaries fostering what the EDM evaluation terms a 'negative view' (*op cit*) (Uddin 1993, p. 18). Despite such an assessment and problems (also verified in the field by the researcher), another report by EDM to the government states that the reaction of the community to the project was 'extremely positive', the project was 'positive and worthwhile development' and 'well accepted by the community' (*op cit*) (Amacher 1993, pp. 4, 5). A condensed version of this report was published in a local newspaper (The Telegraph 1993).

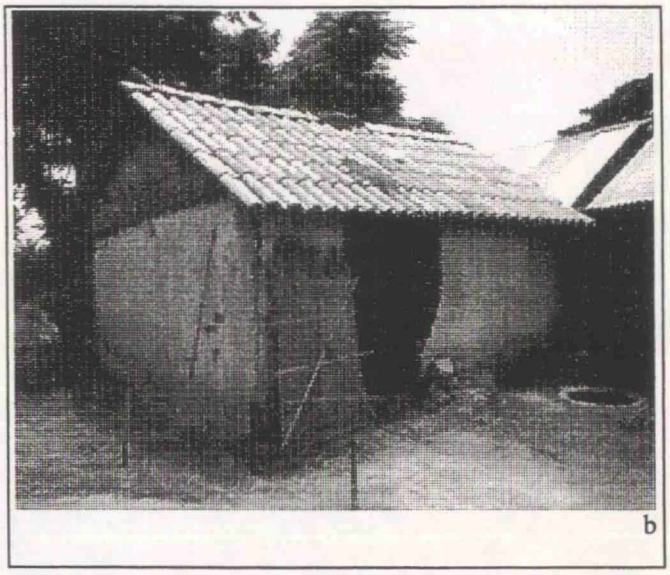
Vignette 6.6. What to do with these cracking walls?

'What to do with these cracking walls?' lamented Ehsan Ali (HH 20), beneficiary of an EDM earth block house. 'The walls now quaver if there is a strong wind, and I am scared that they might break and fall on me! I run to the house next door, I don't feel safe here if there is a storm.' Shortly after construction the walls began cracking and Ehsan felt very aggrieved. One day he went to the market in the town across the river and came upon a construction site for a brick and concrete building. Stepping into the premises he ventured to ask a worker for some cement. The worker was friendly and gave him a handful. Returning home, he mixed it with some sand from the riverbank, preparing a mix as the worker had instructed him. He did not have a trowel or knew anybody in the village who had one, so he used his hands to grout the cracks in the walls, carefully smoothening the surface after grouting. But after a few weeks the surface started peeling off and the grout began falling out. He tried the same process several times and each time there was the same result. He expressed his frustration with the house:

> I am left to myself and I don't know what to do. When they were building I told them I want proper bricks, not these *kutcha* blocks, but they wouldn't listen. Now see what has happened. Go tell them I won't repay the loan unless they replace this house with a brick one.

Fig. 6.23. a. Ehsan Ali's (HH 20) EDM house with stabilised earth walls
b. An EDM house with cracking stabilised earth walls




b

It is reasonable to suppose that the initiative might have been well-intentioned, but due to lack of adequate technical expertise the above problems occurred. However, denial of the problems, at least in the official report, does not lend credibility to EDM's capacity for effective project implementation and evaluation. It might undermine the opportunity to learn from mistakes and improve future interventions. Perhaps the project's remote location dispelled fear of contradictory findings by other agents - an assumption which might well prove untenable over the long term.

In the EDM houses the walls were cement-plastered with a coating of lime whitewash. Although it is unusual for rural houses to have white walls, it appears that villagers found them attractive. On the other hand, such whitewash (common in urban *pucca* buildings; probably the reason for their attractiveness to villagers) requires frequent maintenance because of weathering in the rainy climate; as a rule, the coating has to be renewed after 3-5 years. In this case, it was uncertain who would carry out such maintenance. There was no binding obligation on EDM's part to do so, and it was beyond the ability of beneficiaries. Although the houses appeared to have fared well without such maintenance over four years after construction, it is not certain that they would continue to do so for very much longer. In addition, plastering with cement on compressed earth blocks is generally not ideal and results in surface cracking. As discussed by the researcher in an earlier publication, because of the difference in co-efficients of expansion of the earth wall and cement plaster, over time the plaster tends to crack and peel off (Ahmed 1994, pp. 65-67), possibly the case in the EDM housing.

Despite these technical and design decisional inadequacies, it must be conceded that there are some advantageous aspects of the EDM design. The decision to support the roof structurally on GI posts embedded within the earth walls is sensible, given that the area is flood-prone and earth

walls are liable to collapse in floods. In such an event, households would not face the hazard of a collapsing house and would be able to re-occupy and repair the house after floods receded. The earth walls were built on a brick plinth, contributing to their resistance to floods and sub-soil water. This might appear to have increased costs, but on cost analysis it was found that stabilised earth blocks did not offer a cost advantage over brick, mainly because of the high cost of cement and production (see Table 7.7.). Other than in the EDM project, several sources also suggest that in Bangladesh earth blocks are comparable in cost to, or more expensive than, brick (Dunham 1989, pp. 17-18; SKAT 1991, p. 66). Earth blocks are usually supposed to be a less expensive alternative to brick; if this is not so, the case for their use is undermined.

Table 6.8. Cost comparison of stabilised compressed earth blocks and fired brick

Cost of **earth blocks** *(EDM project; at 1993 prices; calculated from Amacher 1993, p. 6)*	**Tk 1817.40** /1,000 pieces
Cost of **brick** *(average cost, varies regionally; at 1991 prices; from SKAT 1991, p. 113)*	**Tk 1820.00** /1,000 pieces

One of the main advantages of construction with earth blocks is its comparatively shorter construction time compared to traditional monolithic earth wall construction. In the EDM project, one worker with a helper on average produced 200-250 blocks per day. Production of a total of 1300 blocks for each house required about a week. Including acquisition of a supply of raw materials, their processing and construction, each house required roughly two to three weeks to build. In comparison, Bhorosha Bala's (HH 3) earth house with monolithic walls required almost four months to build; in the traditional technique of building in layers of packed earth, it is necessary for each layer to dry before the next one is built on it. As Bhorosha said: 'It could have been done faster, but it is better to take more time so that the building is more durable.' Rainy weather might delay work considerably, and during such an extended construction period it is likely that such weather would be encountered. Such construction requires specialist builders; it is a localised trade, often a skill transmitted through generations of a family, whereas earth block production and construction is relatively easier, requiring a short period of training. In this respect, earth blocks have the potential for replicability. However, the need for expensive machinery diminishes this potential. Reasonably easy to use and not requiring electricity, an earth block press may appear ideal for rural conditions, but is prohibitively expensive and generally not available without institutional involvement. Perhaps institutional support to rural small scale entrepreneurs for producing blocks might overcome these impediments, but this has not yet been attempted in Bangladesh. As long as earth blocks do not offer a significant cost advantage over fired brick, such entrepreneural support would have minimal chance of success.

6.4.2.3. Treated bamboo: boon or chemical nightmare?

One of the responses by agencies to the increased demand and scarcity of bamboo, described in Chapter 2, Section 2.4.2., is to attempt to increase its durability by chemical treatment, thereby

relieving pressure on supply (for example, see Proshika 1994a, p. 1). The Housing & Building Research Institute (HBRI) and Bangladesh Forest Research Institute (BFRI), both government institutions, have been conducting research on bamboo treatment for more than fifteen years, but application is restricted mainly to a few experimental buildings on their premises. Proshika is the only agency found in this research that had attempted to extend bamboo treatment to rural areas by supporting bamboo entrepreneurs. The implementational aspects of Proshika's entrepreneural support programme have been discussed in Chapter 5, Section 5.4.3. This section deals with issues relating to the characteristics of treated bamboo as a building material for walls.

The underlying concept of bamboo treatment is to introduce chemicals toxic to insects and micro-organisms that thrive on starches and cellulose matter within bamboo, thereby resisting their attack and consequent decay of bamboo. There are two main bamboo treatment methods: pressure treatment and immersion. Whole bamboo culms are pressure treated in the *boucherie* method, displacing the sap inside the culm by forcing through a chemical solution. Although part of Proshika's bamboo treatment training programme (Proshika 1993), this method is not followed in the Proshika-supported bamboo treatment workshop studied in this research; the requirement of somewhat sophisticated equipment might present impediments to its application in the rural context, the reason why it was not introduced. Sections and strips of bamboo can be treated by soaking in chemicals in a tank prior to weaving mats, the method followed in the Proshika-supported workshop (there is extensive literature on bamboo treatment; e.g. BARC 1991; Janssen 1995, pp. 6-11; Kumar and Dobriyal 1988, pp. 199-206; SKAT 1991, pp. 84-85, 133-134).

Thus treatment in the programme was restricted to bamboo mat wall panels (*bera*); the decay of bamboo posts was not addressed. Partly because the study area is not far from Dhaka, there is extensive use of RC posts there. Thus treated bamboo posts might not have a market advantage in the area. For poor households, affording regular bamboo replacements is increasingly difficult and treated bamboo might not be affordable at all. For better-off households RC posts are the preferred option, even if this means financial hardship. The intermediate option of treated bamboo posts might attract a very small customer group between the above two groups, but requires a market feasibility study before any definite conclusions can be drawn.

One source maintains that treatment of whole bamboo culms (or posts) requires freshly cut bamboo, making it imperative to conduct such treatment in villages (Wells *et al* 1994, p. 49); obstacles are therefore associated with management of machinery in such a context. However, other sources giving more detail of treatment methods do not suggest such a requirement (SKAT 1991, p. 133). Indeed, another source referring to scientific research states that treatment can be carried out much later than formerly believed (Dunham 1989, p. 25). These diversity of opinions cannot be resolved here; more research and conclusive field level studies are needed. Nevertheless, it is clear that treatment might have to be conducted close to the site where bamboo is used to obviate the need for transporting it, since the common form of transporting it over water by making rafts of it would not be viable as chemicals tend to leach out in contact with water (SKAT

1991, p. 134). Even treatment elsewhere, say in urban locations where it might be easier to manage equipment, and then transporting it by truck, might subject the bamboo to exposure to rain and consequent loss of chemicals.

Box 6.1. Chemical cures
(Excerpted from Farrelly 1996, p. 224)

'Chemical preservatives have been much explored to make bamboo unappetising to bugs, but they are all too expensive for broad scale use among the people, quite apart from their environmental contamination. Selection of proper species, proper harvest and curing proved sufficient for centuries of marvellous bamboo use in the Orient before the appearance of modern chemical techniques. Bamboo strips used for military archives and grocery lists have lasted over two thousand years in China. We have mentioned the bamboo organ in the Philippines still sound since its construction in 1821, cured simply by a six-month burial in sand.'

One of the main problems in chemical bamboo treatment is that the chemical compound used is toxic and presents a hazard to human health. Safety regulations that might be adopted in a more affluent context are generally lacking in Bangladesh, hence the alarm expressed in European publications (see SKAT 1991, p. 134; Wells *et al* 1994, p. 49). However, in contrast to these publications, and frighteningly, in a publication by a non-Bangladeshi advocate of the technology, well-versed in Western standards, it is suggested that the chemical compound 'is safe to use in relatively unskilled hands' (Dunham 1989, p. 24). To a Bangladeshi HBRI staff member, it was clear that the extensive adoption of safety regulations might be economically unrealistic in a developing country such as Bangladesh, and might create barriers to dissemination of the technology; for a staff member of such an institution interested in promoting bamboo treatment, it was 'toxic within acceptable limits', as with many industrial processes utilising chemicals. To remain within the boundary of those limits, simple and inexpensive safety measures are necessary. However, as evident in the field (see Section 5.4.3.1.), despite instructions during training, even basic measures such as protection for hands during immersion in chemicals were lacking. It seems that even weaving treated bamboo with bare hands might cause damage (SKAT 1991, p. 134). It was also not clear how the chemicals were subsequently disposed of. Both Proshika staff and the entrepreneur Abdul Hashem were aware of the perils of toxicity (Hashem himself said, 'If the chemicals go into the eye, it can result in blindness'). Yet there was a general disregard for safety measures by both parties; Proshika did not carry out any monitoring beyond instructions during training. It was certainly a blessing that in the Proshika programme the less toxic compound CCB (copper chrome boron) was used instead of the highly toxic CCA (copper chrome arsenic).

From such observations, it can be inferred that conditions for application of bamboo treatment technology are not as yet very favourable in Bangladesh. Unless accompanied by intensive awareness-formation and the institutional will to extend strict vigilance, this technology continues to pose a hazard to human health and safety.

Related to toxicity, another problem with treatment is that it is not possible to impregnate bamboo permanently with chemicals; they tend to leach out in heavy rain or prolonged contact with water (SKAT 1991, pp. 136, 139; Wells *et al* 1994, p. 49). In rural conditions, this might lead to a

variety of perils, such as from touching wet bamboo walls prior to eating with the hand, and contamination of water sources or harm to children and animals. As the Proshika-supported treatment workshop had been established for less than two years, reports by the entrepreneurs and households with houses of treated bamboo mats that no accidents had occurred needs following up after a longer period of use. The area was prone to flooding during heavy floods such as that experienced in 1988. It is difficult to surmise the effects of such flooding and consequent submersion of treated bamboo walls. As a BFRI staff member said: 'The wider effects of leaching of bamboo treatment chemicals are not yet known. More research is required before it becomes clear whether and what safety measures would be necessary'.

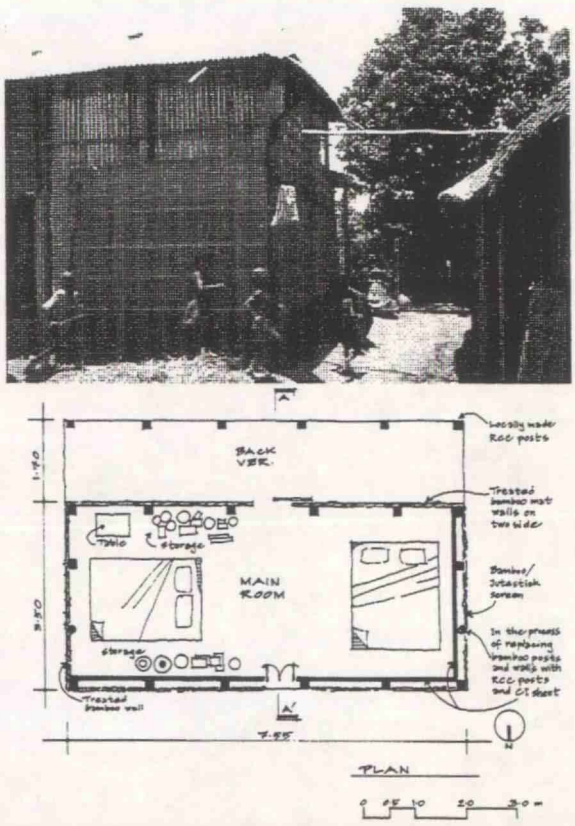
Different figures for increased cost of treated bamboo over untreated have been suggested in the literature, ranging from 25% (Dunham 1989, p. 25) to 50% (Wells *et al* 1994, p. 48). Such variable reports are perhaps due to lack of sufficient empirical information from the limited application of the technology in Bangladesh. As documented in the field by the researcher, price variability arising from manipulation by entrepreneurs resulted in about a 100% increase in cost (discussed in Chapter 5, Section 5.4.3.4.). In addition, due to the escalating price of bamboo, the prices of both treated and untreated bamboo had risen by Tk 5 within a year. Because of such a state of affairs, a technology intended to improve a building material for low-income housing might not remain within reach of most low-income households.

Provision of credit has been suggested as a possibility for overcoming this problem (Dunham 1989, p. 27; Wells *et al* 1994, p. 49). Although credit might prove useful in promoting the technology, the specific set of conditions necessary seems as yet lacking. Observations in the field indicate that households to whom such credit would be available might prefer to use it for other materials such as CI sheet and RC posts; despite the durability of treated bamboo, it still connotes less status than these manufactured products. Bamboo, treated or untreated, cannot compete with CI sheet in status or re-sale value, which might greatly undermine the dissemination of bamboo treatment. If treated bamboo is to serve at all as an alternative, it must prove to have a considerable price advantage and establish its long-term durability. Also, treated bamboo has hardly any re-sale value, so important to villagers who are often forced into distress sale of building components (such as CI sheet). It is thus important to have at least a comprehensive plan for recycling treated bamboo after its useful life as a building material ends. The most likely possibility to be adopted by villagers would be to use it then as fuel. But fumes from burning treated bamboo are supposedly noxious (SKAT 1991, pp. 134, 135), adding another dimension to its toxicity.

The following examples illustrate the attitudes of villagers towards treated bamboo and their greater preference for manufactured materials, indicating how credit alone might not be sufficient to promote the technology:

Rashid Ali (HH 16) was gradually replacing his treated bamboo walls with CI sheet after less than two years of use (treated bamboo supposedly lasts at least ten years) and relegating them to other use. When asked about that, he replied: 'Everybody wants to improve their lives by building a better house [meaning a CI sheet house]. Why should I be an exception?'. Another household, that of Momota Begum's (HH 17), also had a house with treated bamboo walls. Although she mentioned that this house was better than one with untreated bamboo walls or her former jute stick house because insects could not attack it, Momota's household was contemplating seeking an NGO loan for a CI sheet house. Second-hand RC posts had already been bought and stacked in the courtyard, an indication of the initial stage of the process of transition. Even for a household with a lower economic profile, such as Koruna Rani Shutradhar's (HH 19), CI sheet had priority: 'I had to sell my jewellery for us to afford this CI sheet, but we had to put it up without a frame. We barely had about Tk 500 left for the bamboo walls; how could we think of buying treated bamboo?'.

Fig. 6.24. Rashid Ali (HH 16) was gradually replacing the treated bamboo walls of his house with CI sheet



Vignette 6.7. Momota's adoption of treated bamboo

After Hashem set up his workshop for treated bamboo, a few established members of the village community, such as Rashid Ali (HH 16), provided him with patronage and bought his products. Over a year, the durable quality of treated bamboo mats became apparent to other villagers. Momota Begum (HH 17) heard from neighbours that wood-worms did not attack this new type of *bera* (bamboo mats). The untreated bamboo mat walls of her house had deteriorated, and it was time to renew them. Because of this, and also out of curiosity, one day she went with some other women to the village market where Hashem's workshop was. There were several buildings of treated bamboo facing the workshop. There was one next to another building of untreated bamboo, built about the same time; the treated one was in much better condition. Momota was impressed.

Seeing all this, Momota came back home and told her husband about it (he often worked outside the village and was not aware of all new happenings). He went and talked to Hashem, and was shown the demonstration panels in the workshop and some of the nearby buildings. He became convinced and ordered treated bamboo mats to replace the decayed ones of their house, and for their new kitchen.

Despite its lack of popularity as a building material, treated bamboo was in demand for grain storage bins, making it possible for the entrepreneur to charge a high price for it. Because of this use of the product, albeit in a sphere other than housing, it could be argued that the relatively new technology over time through incentives, advocacy, awareness formation, training, demonstration and other such measures might gain more popularity as a building material. For any new technology to be accepted in a traditional community, there is first a need for effective demonstration. Across the road from the bamboo treatment workshop,

there were two adjacent buildings built in the same year, one with walls of treated and the other with untreated bamboo. The treated walls were in much better condition than the untreated ones, directly providing a demonstration of the durability of treatment. However, this could not be perceived by outsiders or observers who were not informed, and calls for promotional measures such as sign-boards to publicise them beyond simple informal demonstration. The location of such a workshop near a market or busy place was also important, as recognised by Proshika (1994c, p. 2), in order to maximise its demonstration effect; the case study workshop was in such a location.

In addition to bamboo, other organic materials including jute-sticks, reeds, thatching grasses and straw can also be chemically treated (see Ahmed *et al* 1994). During the field visit, a Proshika staff member suggested to the entrepreneur that he treats wall panels and roof covers of different types of organic material and display those at the workshop; these could also be used for building the workshop and store room on the premises and serve as further demonstration. With more active support from Proshika, such ideas for promoting chemical treatment may encourage greater use.

As the literature suggests, despite the problems associated with bamboo treatment in a context with climatic and economic conditions such as Bangladesh's, it has the potential to improve an easily perishable material into a durable product with possibilities for application in housing (Dunham 1989, p. 25; SKAT 1991, p. 140; Wells *et al* 1994, p. 49). More research into its hazards, adequate safety methods, its marketability and other aspects are needed before its wider manufacture and use can be deemed appropriate.

6.4.3. Roofing options

In this section, two of the main manufactured products used for roofing are discussed: micro-concrete roofing (MCR) tiles and CI sheet. In the sub-section on the first product, CI sheet is also discussed to highlight important differences between them, as MCR tile is often promoted as an alternative to CI sheet. Because thatching materials - grasses (*chon*), rice straw, etc - have been dealt with in Chapter 2, Section 2.4.4., they are not discussed here separately, but referred to where relevant. In only one house within the research sample, was a RC roof built, subsidised and provided by a loan to a moderately well-off household (HH 26). The government HBRI has experimented with various ferro-cement and RC roofing elements, but except on some experimental structures on its premises, these have not been applied to low-income housing. Such roofing is much more expensive than all other roofing options and its prohibitive cost does not allow it to qualify for discussion in this research on low-income housing. Its unaffordability by the vast majority of the population is clear from the 1991 census which found only 4.1% of concrete roofing in the entire housing stock of Bangladesh (BBS 1993, p. XII).

6.4.3.1. Problems and prospects of micro-concrete roofing (MCR) tile

MCR tile is an innovative roofing material, different from traditional clay tile, consisting of a mortar mix of cement, sand and fine aggregate (in the ratio 1:1:2). The basic process involves vibrating the mix on a table with a vibrating screeding machine prior to placing it on a mould to lend it shape, followed by curing. MCR is an improved version of its predecessor FCR (fibre-concrete roofing) tile, which used natural fibres such as sisal, jute or coir. The production process of both are similar, but because of the tendency of fibres to decay over time, impairing the strength of the tile, most manufacturers have decided to opt for MCR tile by using fine aggregate instead of fibres. The innovation of FCR/MCR can be attibuted chiefly to the company Parry Associates in the UK in the 1970s, now one of the main international suppliers of equipment (Spence 1995, p. 145). In addition to extensive literature generally available on the subject, Parry Associates produces promotional material which provides technical and other details (e.g. Parry Associates *undated*; Parry Associates/ Castle Construction *undated*; Kumar 1991, p. 54; various publications and bulletins of RAS, such as RAS 1994; Proshika 1995a and 1995b).

MCR tile is essentially promoted as an alternative to CI sheet. Some of the main advantages in comparison to CI sheet, suggested by its advocates, are its better thermal qualities, possibility of utilising local materials in contexts where CI sheet or its raw materials are imported, and small-scale, labour-intensive production instead of centralised factory manufacture, hence a potential for generating local employment (Parry Associates *undated*). In this section some of these claims, specifically in the context of Bangladesh, are examined.

It appears that preference and acceptability of MCR tile is related primarily to the cost advantage it might have over CI sheet. Despite general claims of such a cost advantage (Parry Associates *undated*, p. 2), a study by Wells (1992, p. 22) found that this varied according to context, and successful dissemination had been possible mainly where a significant cost advantage could be established; in countries where the contrary was true, it had been very difficult or not possible to market the product, notwithstanding any other advantages it might have. A survey undertaken in Bangladesh on preference for FCR tile of prospective customers revealed that cost was the single most important factor irrespective of income group (MIDAS 1989, pp. 19, appendix 3.2). It was also found that the difference in cost was marginal (9.7%) if both FCR tile and CI sheet had a timber sub-structure (MIDAS 1989, p. 16). Good quality timber is a very expensive commodity in Bangladesh, and because FCR required a more substantial framework of sawn timber than CI sheet, in spite of its relatively lower cost, the entire roof did not offer much cost advantage. Only if a bamboo roof frame was used could a greater cost differential be achieved (57%). Interestingly enough, FCR tile laid on bamboo was only 6.5% more expensive than a thatched roof, indicating that a more durable material than thatch could be purchased with only a little extra investment (see Table 6.9.). However, other than the term 'hay', the nature of thatching materials is not specifically mentioned in the MIDAS report. It can be assumed to be rice straw, but as discussed in Chapter 2, Section 2.4.4., the cost of thatching materials varies considerably according to

region, availability and type; therefore the findings of the report can only be accepted as either very general or location-specific, relating to the survey region.

Table 6.9. Cost comparison of different roofing options *(adapted from MIDAS 1989, p. 16)*

Roof cladding	With timber frame (Tk/sqm)	Cost advantage over CI sheet (%)	With bamboo frame (Tk/sqm)	Cost advantage over CI sheet (%)	Cost advantage over FCR tile (%)
CI sheet	475.70	-	239.80	-	-
FCR tile	433.70	9.7	158.10	51.7	-
Thatch	N.A.	N.A.	148.50	61.5	6.5

Note: Thatch is generally not laid on timber frame

The researcher's investigations found that without taking into account roof structure, the cheaper variety of MCR tile is 24% less expensive than CI sheet (see Table 6.10.), perhaps not high enough for a significant cost advantage. The price of CI sheet varies according to its quality and purchase location; the above comparison has been computed at the rate of higher grade CI sheet, whereas the price of MCR tile is standard because there was only one distributor in Bangladesh during fieldwork in 1997. The addition of pigment almost doubles the cost of tile, making it completely unaffordable for low-income households; coloured MCR tile is more than 55% costlier even than CI sheet. Pigmented MCR tile, mimicking the colour of clay tile, appears to have found a small market in Dhaka; a number of expensive restaurants had utilised them, possibly to impart an European look. This type of tile is not discussed further because it has not been employed in any low-income housing projects, nor does it offer the potential to do so at current prices.

Fig. 6.25. Posh restaurant in Dhaka with red MCR tile roof

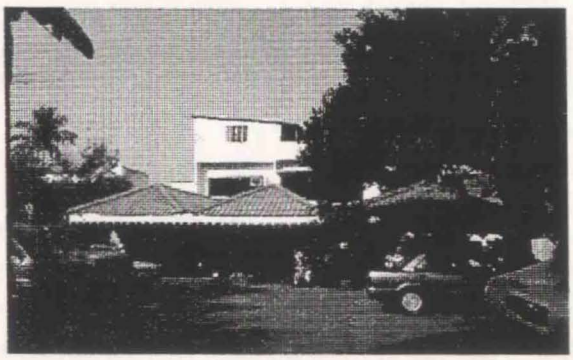
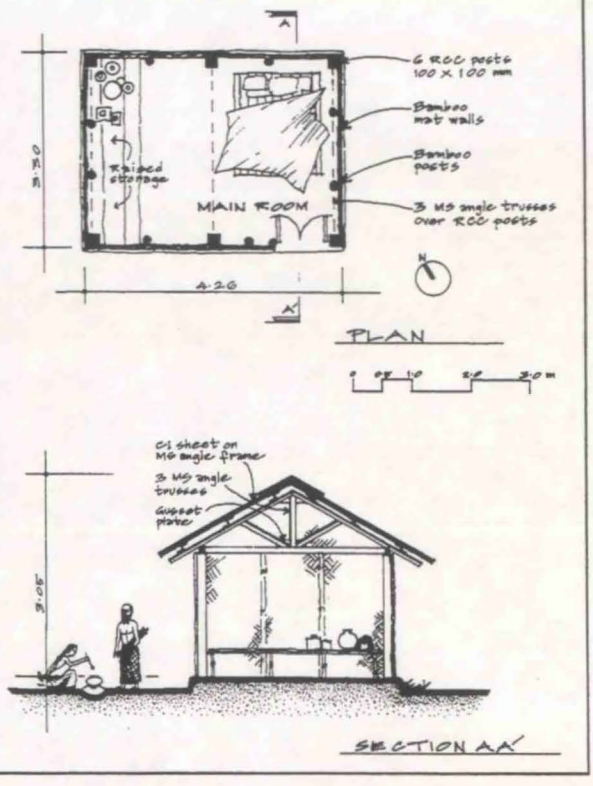


Table 6.10. Cost comparison of MCR tile and CI sheet

Type A	MCR tile/piece (with pigment)	Tk 22.00
Type B	MCR tile/piece (without pigment)	Tk 11.50
C.I sheet (Tk/ 1 sqm)	**MCR tile - Type A** (Tk/ 1 sqm)	**MCR tile - Type B** (Tk/ 1 sqm)
172.30	267.80	139.00
Comparative advantage	55.4% costlier than CI sheet 92.7% costlier than Type B	24% less expensive than CI sheet

Experiments have been carried out on construction with MCR tile on bamboo trusses (Wells 1992, p. 24), which might offer a cost advantage, evident in Table 6.9. above. To increase its durability, treated bamboo was used in an experimental house in northern Bangladesh. Although this might offer a feasible option, there are accompanying hazards of chemical treatment of bamboo, noted in Section 6.4.2.3. In a roof frame protected from rain, chemicals might not leach out, and the frame would normally remain beyond human reach and physical contact, obviating some hazards. However, hazards associated with negligence in the process of treatment remains unresolved. Another option, adopted by Proshika, is to use an MS angle roof frame. At only about 5-10% less expensive than timber, this might not offer much cost advantage. Nonetheless, an MS angle frame, painted for rust-protection, may serve much longer than timber or bamboo, especially given that it would avoid direct contact with water; if widely used, it would reduce pressure on declining organic resources. Unlike the EDM posts buried in the ground, which rusted within a short time (see Section 6.4.1.2.), a roof frame such as that provided by Caritas has greater appeal. For example, Anis Ali (HH 33), a Caritas beneficiary, when facing problems of funds for buying homestead land, seriously contemplated selling off the metal roof frame. However, his friends convinced him of the merit of the component: 'I am glad I didn't sell it. It's a good thing, it will last for a long time.' Notwithstanding these observations, lack of replicability, difficulties of maintenance and repair, and cost, would still present obstacles to widespread adoption of metal roofing frame in low-income housing.

Fig. 6.26. Anis Ali's (HH 33) Caritas house with MS angle roof frame



Another roof cladding material, clay tile, is used and produced mainly in the south-west of Bangladesh; it was possibly never used in central and eastern parts of Bangladesh. The craft declined after the partition of India in 1947, due to the migration of Hindu potters. Clay tile is used widely in housing of low-income communities just across the border in West Bengal (Ahmed 1994, p. 10; MIDAS 1989, pp. 2-3). Although at about Tk 3 per tile in rural areas and Tk 5 in Dhaka (SKAT 1991, p. 75), it offers a significant cost advantage over MCR tile, it had not been employed in any of the housing programmes studied. Because of its limited and localised nature, it is not discussed in detail here. Nevertheless, clay tile perhaps has the potential of wider application with revival, improvement and promotion of the industry, but lacking empirical evidence for this, further study of its potential is needed before definite conclusions can be drawn.

Fig. 6.27. Proshika uses MCR tile in buildings for its own programmes, such as this school

It might be argued that not only the cost of a product determines its potential for dissemination, but also that its marketing is important, primarily needing involvement of the commercial sector. For example, CI sheet, a highly preferred material, is supported by a commercial sector catering to its demand even in many remote rural areas. This commercialisation is based on centralised production with well-organised wholesale distribution channels. For MCR tile, such a mode would undermine its supposed advantage of small-scale local production and employment generation. Unless extensively distributed, such small-scale production might be unable to cater for market demand, if such demand is created. Although small-scale, the establishment of production facilities requires substantial capital input (see Table 6.11.), and at present relies entirely on imported equipment (more than 86% of establishment cost, as in the Proshika programme). With such a high capital investment, unstable or low production (common in Bangladesh because of political problems, natural disasters, erratic cement supply, etc) affecting the time-span of cost-recovery and adding overhead costs, might not be feasible for many entrepreneurs. Unlike RC posts which requires a much lower capital investment, small-scale rural entrepreneurs establishing an MCR tile production workshop would invariably have to depend on institutional credit input; without adequate marketing, repayment of credit would present problems. Moreover, in rural locations, the need for imported equipment, water supply (MCR tile production requires large quantities of water), suitable land, electricity (human powered production is also possible, but not yet applied in the programmes in Bangladesh), etc would make the enterprise risky without an existing, established market. This is a somewhat vicious circle: dissemination might not be possible without production on a scale sufficient to establish the product on the market, whilst without such a market it might be difficult to sustain production.

Table 6.11. Establishment and running costs of an MCR tile production workshop
(adapted from Proshika 1995b, p. 5)

Item	Quantity	Cost (Tk)
• *Capital investment*		
4.5 x 3.0 m building with verandah	1	12000
4.5 x 0.75 m curing tank	1	8000
Tubewell (inclusive of installing)	1	7000
MCR tile production equipment with maintenance tools	1 set	**175000**
• *Running costs (inclusive of 3 months' materials supply)*		55000
• *Land lease, electricity connection, etc*		3000
TOTAL		**260000**
* *An additional Tk 5000, if a deep-set tubewell is required*		

Despite similar problems, in several Latin American countries it has been possible to overcome many of them through various initiatives, allowing dissemination of MCR tile there (Rhyner-Pozak 1994, pp. 24-27). However, this created a new set of problems. In Honduras, because of the high cost of imported equipment, local producers began to manufacture less expensive equipment locally. It was of low standard, leading to production of poor quality MCR tile (Rhyner-Pozak 1994, p. 24). Such a course of events might seriously undermine consumer confidence in the product, eventually affecting its marketability, and requiring renewed intervention by external promoting agents. This suggests that the technology requires support on a sustained basis in the absence of independent and autonomous good quality local production. MCR tile production equipment is rather sophisticated, requiring a high level of industrial infrastructure to achieve acceptable standards; hence its high cost. In some developing countries, such as India and Cuba, it has been possible to produce MCR tile equipment of acceptable standard (Rhyner-Pozak 1995, pp. 24-27). However, both these countries have a much higher level of technical/industrial development than many other developing countries such as Bangladesh (India produces computers as well as nuclear weapons). In many such poorer countries, such as Nicaragua (see Box 6.2.), where even maintenance and management of imported equipment presents difficulties, reliance on production of standard, quality equipment is rather unrealistic.

Box 6.2. MCR tile production in Nicaragua
(From a report by Harder 1991, pp. 21-22)

From his experience as consultant at an MCR tile plant in Nicaragua, it became evident to Luzius Harder, the Swiss architect, that whenever he went away for a few months, problems in production occurred. He further observed: 'Other tile manufacturing plants in Nicaragua faced similar problems, when left without the guidance and control of Europeans'. He presented a list of these problems:

- Problems with mixing and curing
- Organisational problems
- Maintenance problems

Harder came to the conclusion that many of these problems were due to a cultural orientation differing from that of a more industrialised culture, serving 'to show how two cultural approaches from different worlds clash in the MCR industry'.

Adding to these problems are requirements of training for both production and construction. As observed by Moncrieff (1991, p. 27) during the provision of training in MCR tile technology in Nepal, 'Few trainees escape without 10% of their tiles rejected' and 'Fitting tiles to a roof is not as easy as it looks'. In Bangladesh, without a tradition of tile roofing in most parts of the country, intensive training of construction workers would be essential, further raising programme costs. In the RDF project which used MCR tile, trained construction workers were supplied by the local equipment distributor, transported over a long distance to the project area, and they left after project completion. Thus without a local supply of MCR tile and skilled workers, beneficiaries were left with no possibility of repair or replacement of the tiles.

In present circumstances in Bangladesh, poor marketing prospects for MCR tile remains one of the main impediments to its dissemination (SKAT 1991, pp. 71-75). A factory established in Faridpur district in the 1980s ceased production because of lack of demand (SKAT 1991, p. 72). Proshika had undertaken entrepreneural support programmes for production of MCR tile, but due to lack of

demand, Proshika itself absorbs the tiles produced for its projects: construction of schools, village resource centres, etc. Construction of these buildings was expected to create local demand by demonstration, but despite extensive promotion campaigns by Proshika fieldworkers, it was very difficult to convince rural households to accept MCR tile as part of a housing loan. All the cases in the research sample with MCR tiled roofing said they preferred CI sheet to MCR tile. In the RDF project, houses were provided as grants, hence beneficiaries accepted the MCR tiled houses. Indeed, because the houses were given free, despite problems experienced by beneficiaries, neighbouring non-beneficiaries still wanted them. Although the EDM project was a housing loan programme (see Sections 4.3.1.4. and 5.3.2.1.), because of the precedent of extensive grant housing, households had interpreted the new credit programme as welfare and therefore accepted the MCR tiled houses. Given the choice, they would have without question opted for CI sheet.

As well as not offering a significant cost advantage over the more popular CI sheet, there are various other problems with MCR tile compared to CI sheet. CI sheet has a re-sale value for distress sale, important for low-income households. It can be readily dismantled and sold off, and its transportation is relatively easy in rural conditions. MCR tile does not offer such advantages. It is difficult and laborious to dismantle, often resulting in breakage in the process, and a market for re-sale does not exist widely. In fact, this was the reason why RDF chose MCR tile in its grant housing project: because of the propensity of some recipients of free houses to sell off components such as CI sheet to meet other household needs. Nevertheless, it should be mentioned that in the EDM project, a household had sold some of the MCR tiles, using money from the sale to add to the cost of a CI sheet roof; remaining tiles were used for roofing a verandah addition to the house. A somewhat wealthier household had bought the tiles to roof its new kitchen. This demonstrates the greater preference for CI sheet, but also indicates that MCR tile is more acceptable for ancillary structures than for the main house, confirmed by reports of several

Vignette 6.8. Who wants MCR tile?

Nobody liked MCR tile in the RDF project area in Noakhali. From the Union Council chairman to beneficiaries and local villagers, all denounced it as fragile and undesirable. They compared it with CI- sheet-roofed houses, which they felt were 'more durable' and 'prettier'. Problems of breakage during transport and falling coconuts *in situ* were cited as some of the reasons for this lack of preference. Coconut production in the region, in addition to the preponderance of coconut trees on most homesteads, was evident when the research team was offered fresh coconut milk during the visit to Mofizul Haq's (HH 31) house; it was informed that, 'compared to the price of Tk 8-10 of green coconut in Dhaka, here it was only Tk 3-4'.

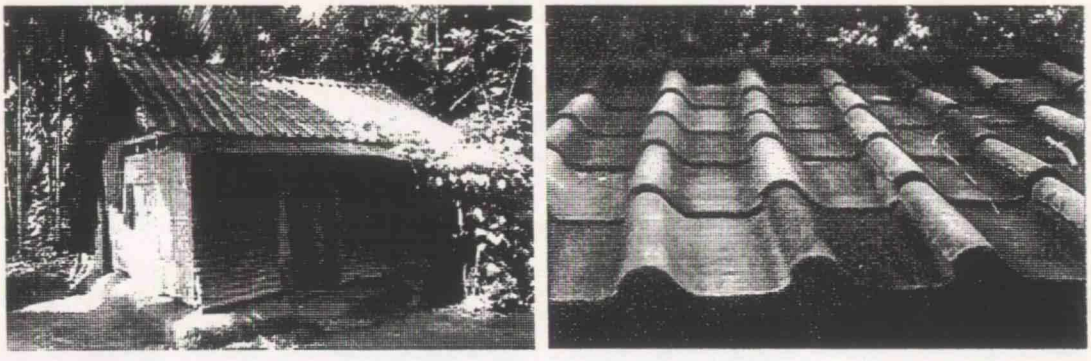
Mofizul also expressed his low opinion of MCR tile, yet he had wanted a RDF MCR tiled house when they were being distributed. However, he was rejected and some of his poorer neighbours were granted them instead. It might be thought that at that time he was unaware of the weaknesses of MCR tile, but now after witnessing the difficulties faced by his neighbours he ought to think otherwise. Mofizul was the rickshaw driver taking the researcher back to his accommodation after the field visit. On the way he insistently beseeched the researcher to ask RDF to grant him a house: 'At least it would be better than my present thatch roofed one', he said. The researcher recollected that, during the field visit, Mofizul had mentioned several times that his thatched roof leaked, but when it had rained heavily and the team had to seek shelter inside the house, there was no sign of leakage. Could his comments about the leakage be connected to Mofizul's ardent desire for a grant house?

respondents during fieldwork. For example, Masuda Khatun (HH 30), a recipient of a MCR tiled house provided by RDF, said:

> If we had our way, we would have built a tin [CI sheet] roofed house. It would have been prettier and better than this one. If we could save some money, we would replace this roof with tin and use the tiles for building a kitchen.

The region where Masuda lived is near the coast and strong winds are common, and coconut palms are ubiquitous. Thus the decision by RDF to build MCR tiled houses was met by the contextual problem of breakage from falling coconuts, experienced by several beneficiaries. In Jasmin Ara's (HH 29) house, 4-5 tiles broke from falling coconuts during the May 1997 cyclone, shortly before the field visit. Although the intensity of the cyclone was less pronounced in this area, the wind was strong enough to dislodge coconuts from the trees. In Masuda's house, many more tiles broke and in the absence of an available supply of MCR tile, she had to repair the gaps in the roof by makeshift materials such as palm leaves and salvaged pieces of CI sheet. In fact, in both Masuda's and Jasmin's houses, tiles had started cracking soon after construction and the roofs began leaking. 'The tiles are too weak, they break too easily, especially in the rainy reason when they become soft after absorbing water,' said Masuda; she remained uncertain of the future of her roof. In addition, despite local production of the tiles in a temporary workshop about 2-3 kms away, during transport by ox-cart through fields on an unpaved road, about 40-50 tiles broke. Although RDF had made amends for this breakage during construction, it demonstrates the intrinsic problem with the product in rural conditions, a problem that does not occur with CI sheet.

Fig. 6.28. Masuda Khatun's (HH 30) MCR tile roof faced constant danger of breakage from falling coconuts



An advantage over CI sheet claimed by advocates of MCR tile is that CI sheet tends to rust, especially in humid regions with high rainfall which may reduce its service life (Proshika 1995a, p. 6). However, in such a climate, algae and moss tends to form on MCR tile, which although not seriously impairing durability, imparts a tarnished look to the roof within a short time after construction, demoralising for residents who had acquired a supposedly 'modern' product. This was evident in the projects visited during fieldwork, most of which had been built 3-4 four years prior to the visit. As suggested by a RDF staff member, it is possible to maintain regularly and keep MCR tiles clean, but to do so, it is necessary to climb on the roof. It is difficult to envisage how that can be done without damaging the tiles, given their fragile nature and propensity to break. Furthermore, in Bangladesh it is difficult to find sand free of clay in the predominant

floodplains because of the nature of alluvial soil (Ahmed 1994, pp. 26-27), which can cause problems in producing good quality tile. Suitable sand from other places might have to be brought in, adding transport costs and undermining the claimed advantage of production from local materials. The problem of clayey sand affecting the quality of MCR tile has been noted by Wells (1993b, p. 212) in a project in Kenya.

Despite all these problems, MCR tile has some plus points. All of the residents of MCR tiled houses mentioned how much cooler and more comfortable they were compared to CI sheet houses. They also confirmed the claims of agencies that because the tiles were tied to the roof frame they generally tended not to lift off during storms as CI sheet did. However, whether these advantages are sufficient to offset the drawbacks discussed above is open to question. In a study of MCR tile in Bangladesh, it is tactfully suggested that 'MCR technology could be a useful option in many circumstances, provided that professional training, quality control and marketing are adequate' (SKAT 1991, p. 72). This bypasses the crucial reality of the tremendous obstacles to providing these pre-requisites. Perhaps time will provide better answers. But for now, what was observed appears to show that as far as small-scale rural production and low-income housing is concerned, the chances of successful promotion of MCR tile are rather slim.

6.4.3.2. The ubiquitous corrugated iron (CI) sheet

Although CI sheet has been discussed in the preceding section in relation to MCR tile and in Chapter 2, Section 2.4.4. as a response to the supply constraints of thatching materials, because of its ubiquity as a roofing material it is now considered more thoroughly. Despite being a manufactured material, CI sheet is not an alternative or innovative material in the same sense as MCR tile; in most regions there is available supply and local construction skills for building with CI sheet. Commercialisation and dissemination have been achieved mainly by the private commercial sector. CI sheet is either imported into Bangladesh, or its raw materials including pig iron and scrap steel are imported for local production (SKAT 1991, p. 58). Quite often coils of steel sheet are imported and then galvanised and corrugated locally (Palmer-Jones *et al* 1992, p. 62). It appears that domestic production could cater to internal demand, but the market is skewed by competition from imported supply; despite being on average 50% more expensive, imported CI sheet is preferred for its 'shiny colour' (SKAT 1991, p. 58) and perhaps because of local perception of better quality of foreign products.

There are very low grades of locally produced (and also some imported) CI sheet in the market. As Proshika reported, it is often difficult to find good quality sheet in provincial markets (Proshika 1994d, p. 2) and fieldworkers have to search diligently in order to secure suitable quality supply for Proshika housing loan beneficiaries. Even in the Grameen Bank (GB) programme, where it is part of the routine for staff to ensure that beneficiaries buy good quality CI sheet from the market, sometimes because of its unavailability in rural areas, a compromise has to be made. Staff members of several agencies, including these two, reported similar problems. There is reliance in

rural areas on CI sheet supply from cities, with the accompanying disadvantage of greater use of embodied energy in transport and higher price.

One of the inherent drawbacks of CI sheet is its poor thermal performance, affecting human comfort in the Bangladeshi hot-humid climate. It tends to heat up fast as well as to cool down quickly. On hot summer days it might be hazardous to even touch it. Reasons for such thermal behaviour is explained by Givoni:

> ... a polished metal has a very low absorptivity and emissivity for both shortwave and longwave radiations. Therefore, while being a good reflector of radiation, it is a poor radiator and can hardly lose its own heat by radiative cooling.
>
> (Givoni 1976, p. 107)

Generally, a shiny new CI sheet reflects a portion of the daytime incident shortwave radiation, while allowing the rest to pass through to the interior of the building. In the process, shortwave radiation becomes transformed to longwave radiation, and because CI sheet has low absorptivity of longwave radiation, the interior of the building becomes hot. The smaller proportion of radiation absorbed cannot be emitted easily and thus causes the sheet itself to heat up. The heating-up of the interior is obviously more pronounced if the walls as well are of CI sheet. If the sheet is painted white, then a much larger amount of the incident radiation would be reflected, allowing the interior to heat up less. Over time, as CI sheet rusts and becomes darker in colour, it reflects even less radiation than its former shiny surface; thus the interior of buildings with older and rusted CI sheet can become intolerably hot. Koenigsberger and Lynn (1965, p. 29) have provided comparative empirical data on thermal qualities of CI sheet with different surface characteristics.

Extending beyond basic human discomfort, it is also suggested that the thermal disadvantage of CI sheet is a cause of health problems for inhabitants of houses built with it. As noted in Panama, with similar climatic conditions to Bangladesh:

> ... problems like heat irradiated from tin [metal sheet] roofs, rapid variations of temperature of approximately 10 degrees Fahrenheit or more produced by excessive humidity with the production of high condensation, affecting the population with colds and allergies.
>
> (Navarro 1986, pp. 214-215)

Almost all the households with CI-sheet-roofed houses within the sample of this research reported thermal discomfort, especially hot interiors. However, it often appeared too obvious an issue to them; complacency regarding this inconvenience was evident, possibly because other considerations such as durability and status outweighed the discomfort experienced. In some instances, initiating this topic during discussion became embarassing because of its obvious nature and was met by incredulity: 'How can a tin [CI sheet] roofed house not be hot?', exclaimed Shudipto Chandra Ray (HH 11). Households living in thatch roofed houses, whilst acknowleding their better thermal performance, nevertheless aspired to CI sheet. The researcher was again met by stupefaction by such a household, that of Jamal Alam's (HH 15), evident in his wife Samira's comment: 'Do people live in a thatched house because a tin [CI sheet] house is hot?'

Thus thermal discomfort of CI sheet is often more important to the outsider, not belonging to rural society, than to low-income users. Most of the criticism of the thermal deficiency and other problematic aspects of CI sheet is from outsiders, quite often Western (or urban and educated) observers or academics (illustrated by the example in Box 7.3.). For most users of CI sheet in rural areas such criticism is generally irrelevant. To view their choice negatively is somewhat condescending, at best romantic in its criticism of socio-technological change, and indicative of a position of relative privilege where such a choice does not have to be faced, hence the lack of genuine understanding. Whether the observation of Navarro in Panama, cited above, about the adverse negative effects on the health of residents of CI-sheet-roofed houses was based on thorough medical evidence or merely speculative is not known. A variety of other factors affect the health of low-income communities in the developing world, and living in CI-sheet-roofed houses is perhaps among the least of them. It might be argued that living in CI-sheet-roofed houses further worsens the physical well-being of those already afflicted by indigent health and environmental conditions, but only after a comparative analysis of other roofing alternatives in the light of constraints experienced by households. For example, a thatch roofed house might perform well when newly built and if regularly maintained, but in the context of diminishing natural resources, increasing price and general impoverishment, its proper construction and upkeep presents low-income households with tremendous difficulties. Thus for a household living in a

Box 6.3. Extraneous commentary on CI sheet
(excerpted from Glassie 1997, pp. 254-255; comments within square brackets are the researcher's)

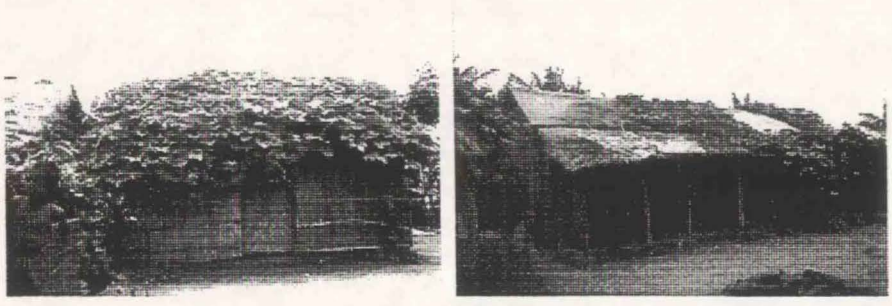
'In Bangladesh, as in Africa and South America, indigenous materials for walls and roofs are giving way to milled "tin". I understood it first in Ireland where farmers class houses into old and new by roofing. The old are thatched, the new are covered by sheets of metal. Thatch makes good insulation, it costs only time and energy [not anymore, it also costs money]. The material grows from the land [but access to such land is increasingly restricted, or the land is lost to other uses] ... The metal does not suit the climate, it is environmentally inept, and it requires ready cash [generally all building materials do]. To pay for a foreign product, people must accumulate examples of their national currency. They are drawn into paying jobs, becoming little wheels in the big machine that gathers wealth for distant capitalists [beginning from provincial petty traders of CI sheet to urban importers and suppliers to international exporters, a whole range of 'capitalists' benefit; to an extent such commerce also benefits the local economy]. The change from thatch to metal signals the surrender of local autonomy [perhaps leading to a different form of autonomy? At least it does allow a household to pursue other activities instead of repeatedly spending time on maintenance and collection of thatch]. At the *ghats* of Bangladesh, men are carrying sheets of shiny corrugated iron, made God knows where, to wooden boats for distribution through the green countryside. People have chosen. They want tin, not thatch, overhead. They have chosen ease, permanence, reliance upon distant producers, and participation in the cash economy [all of which were necessary in writing Glassie's book; why should they not benefit from these while Glassie does?]'.

Fig. 6.29. When village youth were asked to draw their 'ideal rural house', they usually drew a CI-sheet-roofed house, indicating the general preference for such roofing

makeshift roof, poorly maintained, leaking, or harbouring insects, the desire to somehow acquire a CI sheet roof and overcome such problems can be a powerful motivational factor, overriding concerns for issues such as thermal comfort. In addition, the higher social status that such a roof confers upon the household in some cases rules out all other considerations.

It should be noted however, that most low-income households that can afford CI sheet, can usually buy only the lower grade sheet, which tends to rust and leak within a short time. Although demoralising to an extent, this option still seems better to households than a thatch roof, according to fieldwork findings. Despite owning a CI-sheet-roofed house, it is generally possible to distinguish a poor household from its better-off neighbours by the type and condition of CI sheet. Corrosion is experienced by most varieties of CI sheet in the humid climate; even good quality sheet is not spared, although it might hold out longer. Galvanising becomes damaged in places where sheets are pierced or drilled for fastening, allowing corrosion to set in, gradually enlarging the holes. It is common for better-off households to sell off rusted CI sheets (or exchange them for labour) to poorer households, replacing them with new sheets. It appears that the shiny look of new CI has the prime appeal and status. The dynamics behind aspiration and status relating to CI sheet in rural Bangladesh are intricate. One of the reasons for households subscribing to programmes such as the GB is to acquire funds to buy CI sheet. Bhorosha Bala's (HH 5) household utilised a GB general loan intended for income-generating enterprise to buy CI sheet instead, circumventing GB regulations against it, illustrating the point (see Chapter 4, Section 4.3.2.).

Fig. 6.30. Growing vegetable-bearing creepers on the roof



It is not that because of other priorities households are entirely indifferent to the thermal problems of CI sheet; for example, adapting CI sheet to the traditional practice of growing vegetable-bearing creepers on a roof is common, and this acts as an insulative layer. When discussing the thermal drawbacks of CI sheet with Naz Jahan (HH 8), she disclosed her plan of growing vegetables on her roof; in a follow-up visit a year later, it was found that she had carried out this plan. In some places households cover the CI sheet roof with a layer of thatching materials or palm fronds, serving as additional insulation as well as allowing creepers to find a grip. It is not necessary for the thatching materials used for covering CI sheet to be very high quality and the quantity is much less than that required for a fully thatched roof; waste rice straw or other such leafy or fibrous materials suffice. However, such practices are generally intuitive and not the result of a conscious and directed effort at minimising heat gain; there is definite scope for professional guidance and encouragement.

Most households are also aware of the effectiveness of a ceiling or loft in reducing heat radiating downwards from a CI sheet roof. Where this measure is affordable, households adopt it, or many have plans for such future additions. In the AG-WVB project in Chittagong, in a school built as part of the project, an insulative layer of bamboo mats incorporated within the roof structure provided a larger degree of protection from heat. It was pointed out quite accurately by WVB site-office members that this was conducive to a better learning environment inside the schoolrooms. Most agencies that provided built houses, despite awareness of the effectiveness of a ceiling or insulation in improving thermal performance of a CI sheet roof, did not generally incorporate such elements into their design. As an ASA staff member said, 'We didn't have funds for this in our budget. It is something that beneficiaries can add later on their own'. Thus this practice by agencies amounts to provision of a structure approximating to a house as much as possible within constraints of budget and type of housing programme; households then adapt to and personalise it according to their needs, building various additions, extensions and in some cases modifying the house. Most houses provided by agencies were amenable to the addition of a loft, depending on household resources. But during the initial period of occupation when resources might not be available immediately, households have to suffer the onslaught of heat from the CI sheet roof. Hence such complaints: 'They [ASA] didn't build the house properly, it's too hot inside. At least they could have given us some extra *bera* [bamboo mats] to build a ceiling', voiced by Nazmul Islam (HH 23), beneficiary of an ASA house, who could not organise funds for such an addition more than a year after the house had been built.

Within the boundaries of a homestead or neighbourhood, household members, especially women whose life is mostly home-centred, spend a large part of the daytime outside the house in its immediate precincts. It is typical that various household activities are carried out in the courtyard or other open spaces within the homestead, or in ancillary structures (such as the kitchen). The house often serves as a night-time resting zone and for the storage of important possessions. Hence daytime heat gain is not always a significant aggravation. Many households mentioned sitting on verandahs, using hand fans or planting shade-giving trees around the house as measures to cope with heat inside a CI-sheet-roofed house. In fact, to some extent, the verandah is an ideal space for such a function: a shaded semi-open space keeping the sun out but allowing the breeze. Some that could afford it, such as Lokman Mia's (HH 18) household, installed an electric fan. Others with an amicable neighbour having a house with such an amenity sought temporary refuge there on very hot days. An example of this was Koruna Rani Shutradhar's (HH 19) household, living next door to her wealthier brother-in-law who owned a large CI sheet house with an electric fan. When visiting her household on a very hot summer day, the research team had to conduct most of the discussions in that house because it was too hot in Koruna's. Thus combinations of space use patterns, utilisation of social/family networks and availability of resources allow households to cope with their environment and poor thermal qualities of building materials such as CI sheet.

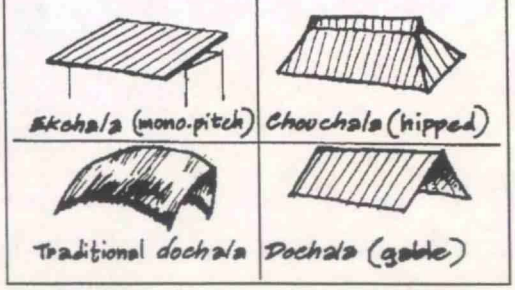
There are extensive anecdotal reports of the hazards of CI sheet lifting off from the roof in severe storms, literally flying and causing injury to villagers. During a field trip to Dinajpur district, there

was a violent morning thunderstorm; after that, a visit to the house of an Adarsha Gram beneficiary, Rohima Khatun's (HH 12), elicited the following narrative:

> The roof was shaking and rattling and we were very frightened that it might collapse. I was worried for the children who were outside and might get injured by flying tin [CI sheet]. I called everybody and gathered them, and we all took shelter in that thatched house of ours across the courtyard instead of this house. It is safer there than in this tin house. It often falls apart in storms and we have to repair it. Luckily, the storm stopped soon this morning and the roof is still all right, even though it was trembling so much.

Less dramatic, but nevertheless troublesome for households, is the more usual tendency for CI sheet to get dislodged or to upturn in strong winds, necessitating frequent repair, as Rohima complained. Improved techniques of tying down sheets to the roof frame are suggested in various manuals, based on experience elsewhere, mainly in the Pacific islands (Lapish and Lynch undated, pp. 50, 54; Mayo 1988, p. 31), but these are generally not widely available, nor adapted to the context, nor disseminated in locally comprehensible form in Bangladesh.

Fig. 6.31. Typical roof forms in rural Bangladesh



A brief note on roof form deserves space here. The least expensive roof form utilising CI sheet (40% cheaper than a gabled roof) is the mono-pitched (7.5° slope), locally known as *ekchala* or *chapra*, generally uncommon in traditional housing. WVB used it in its 1988 flood rehabilitation programme, conceptualising the roof as a refuge during future floods. Beneficiaries were generally not satisfied, and complained that because of the low height, the house was hotter and appeared less roomy inside. It was not possible to add a loft to reduce heat gain, which could have also served as a covered refuge space during floods. Rain penetrated from under the eaves, resulting in addition of verandahs by beneficiaries to prevent this to some extent (Hodgson 1990, p. 9). The GB earlier house design also consisted of an *ekchala* roof, but because of experience similar to WVB's, it was not followed in subsequent housing. Households such as Bhorosha Bala's (HH 5), compelled because of lack of funds to build an *ekchala* roof, aspired to gradually acquire more CI sheet and build a gabled or hipped roof. Thus when Banu Khatun's (HH 40) household sold off the WVB house, they retained its CI sheet and, using some additional purchased sheet, built a new gabled house. The gabled roof (*dochala*) is quite common, but in terms of sturdiness and resistance to strong wind, a hipped roof (*chouchala*) is better (Islam *et al* 1989, p. 30; Mayo 1988, p. 18). According to Islam *et al* (1989, p. 30), *chouchala* requires both less wall and roofing materials, and it provides better protection from rain to all four walls. It is also socially desirable and considered attractive, as Lokman Mia (HH 18) stated succinctly: '*Chouchala* is prestigious'. Despite these advantages, a *chouchala* is more difficult to build, requiring higher labour cost, often a deterrent for households, and a reason why it is not as common as one might expect.

The only technique to improve the resistance of CI sheet roofs to strong wind evident in the projects studied was use of J-bolts to secure CI sheet to rafters in the EDM post-tornado rehabilitation project in Saturia and the AG-WVB projects in Chittagong and Cox's Bazar. According to a WVB staff member, because of their improved design, these houses had experienced three major cyclones and survived much better than non-beneficiary houses in the project areas. This assertion was confirmed to some extent by the report of Sajjad Ullah (HH 37), a beneficiary of the project in Cox's Bazar, regarding the May 1997 cyclone; a few houses were slightly damaged, but in general there was no great devastation. However, in a study of the Chittagong project after the 1991 cyclone of greater magnitude, it was found that most houses were severely affected (Palmer-Jones *et al* 1992, p. 59). The majority lost all or most of their CI sheets and they were torn off from the J-bolts. The study recommended more fastenings and a greater number of purlins, consistent with recommendations in manuals mentioned above. Thus J-bolt fastenings are capable of a degree of resistance, better than other fastenings in general, but there is more to be desired in terms of resistance to very strong winds. Guidelines for better resistance could be followed at a small increase in cost, and their importance in safeguarding human safety and the service life of houses cannot be overemphasised.

Vignette 6.9. Flying CI sheet (I)

In May 1997 a cyclone crept up to assail the coastal areas of Chittagong district. Throughout the day there were stong winds and rainy weather, and Shopon Mia's (HH 35) household, living in the AG-WVB settlement, knew from previous experience that an impending catastrophe was approaching.

As night fell, the force of the wind intensified, and Shopon could hear the CI sheet of his roof quaver violently. There was no electricity supply in the settlement and it was difficult to keep the lamps lit with the forceful wind whistling into the house through any gap it could find. Shopon went into the loft (hardly high enough for him to sit) and in the dark began tying down with rope the CI sheet which was threatening to fly off. It was a tough task, requiring a persistent struggle with the storm, and in the process Shopon's hand was slashed by the CI sheet and began bleeding profusely. But he was in no position to pay heed to it in his battle to save the CI sheet. He managed to save most of it, but some of the sheet broke and flew off.

When the cyclone abated the next day, there was a free-for-all salvage operation by members of the AG-WVB community and their neighbours. It was not possible to identify personal CI sheet; people gathered what they could. Shopon found some sheet, but it was not enough. Thus he carried out makeshift repair and began saving funds to gradually buy new CI sheet.

Vignette 6.10. Flying CI sheet (II)

As quite common, the April 1996 tornado in Tangail district moved along a narrow curvilinear route, causing devastation on the way. Residents of settlements adjacent to this route observed the havoc without being affected. A few kilometres away was the ASA office, whose manager reported that on that fateful afternoon the office staff were completely unaware of the destruction occurring not very far away. 'I had to step out of the office for some work and in the distance I saw the flying tin [CI] sheets', she said. 'At first, I wasn't very sure of what I was seeing; I thought they were birds.'

Nevertheless, any increased cost, however small, would magnify the unaffordibility of CI for many low-income households, and require support from agencies. For such households it is a prohibitively expensive item in comparison to thatching materials; unless supported by credit, its purchase is often not feasible. For example, Mofizul Haq (HH 31) spent Tk 700 on rice straw for

the roof of his house. For a roof of a house of comparable size (about 12 sqm), the cost of good quality CI sheet would at least be Tk 3000-4000, four to five times more expensive, and exceeding the cost of Mofizul's entire house (Tk 2300) built of natural materials. The additional cost of local hardwood timber framework for the CI sheet roof would amount to about Tk 4000, at least ten times more than Mofizul's bamboo roof frame. Such a high cost differential is evident from Table 6.9. (Section 6.4.3.1.) showing comparative prices of different roofing options.

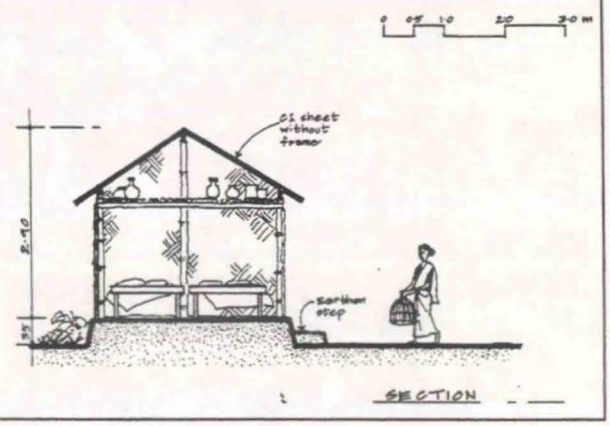
The type of roof that agencies such as the GB stipulates, high grade CI sheet on hardwood timber frame, can amount to more than 60% of the cost of a typical GB basic house (see Table 6.12. below; cost breakdown of timber for roof frame and posts was not available, therefore the composite figure is presented). It is not only that CI sheet *per se* is expensive; the requirement of timber for the roof frame contributes over 50% to the cost of the roof. Therefore it is highly distressing for households, such as Mohammed Ejaz's (HH 13), to note insect attack on the timber roof frame of their houses. Thus the problem of roofing can be articulated as a problem also of a suitable and affordable roof frame, not only one of cladding material, as presented by advocates of alternative roof cladding materials such as MCR tile (discussed in the preceding section). In Caritas projects, a metal roof frame was used, slightly less expensive than timber, with potentially better long-term performance, and highly appealing to beneficiaries. However, this option has problems of replicability in the rural context and its application would require reliance on external agents for its provision and repair.

Table 6.12. Materials and labour cost breakdown of Naz Jahan's (HH 8) GB house
(exclusive of later extension)

ITEM	COST (Tk)*	%
CI sheet (2.4 m long, 21 pieces)	5,600	32.37
Timber (for posts and roof frame)	7,500	43.35
Bamboo walls	1,500	8.67
RC posts (four)	1,700	9.83
Labour cost	1,000	5.78
Total	**17,300**	**100.00**

Although CI sheet can be used on a bamboo frame, this is generally not the preferred option; especially if a household has decided to use (and can afford) CI sheet, it aspires to a more durable roof frame. Because CI sheet is a status symbol, households desire the maximisation of this status by using a durable roof frame. Some poorer households are compelled to use a bamboo frame, or indeed such as those of Momota Begum's (HH 17) and Koruna Rani Shutradhar's (HH

Fig. 6.32. Momota Begum's (HH 17) house had a CI sheet roof without framework



19) built a CI sheet roof without framework. But most of these households wished to be able to save enough, or to obtain an agency loan, eventually to build a CI sheet roof with timber frame.

There is a dearth of alternative roofing materials for rural housing to address the scarcity of traditional thatching materials. Despite the shortcomings of CI sheet, it also has several strong advantages, a reason for its popularity. Its comparative durability and need for less maintenance makes it an option worth striving for. It serves as an asset that can be sold during financial difficulty. Light in weight and not brittle, CI sheet does not present any serious hurdles during transport in rural conditions, it requires less structural support than tiles, and it is possible to climb upon a CI sheet roof to repair it. It is a familiar material, within a context of locally available construction and repair skills. Locally produced CI sheet can be promoted to reduce the burden of import. As suggested throughout this section, there is the potential to overcome most of its shortcomings and to adapt it to improve its performance. Given interest to maximise this potential and to formulate mechanisms to make it an attainable building material for a larger section of the rural population, CI sheet can serve as viable roofing option for rural communities.

6.5. COMPARATIVE ANALYSIS OF HOUSING DESIGN TYPES

The two categories of housing design - agency-designed and self-designed - were explained in Section 6.2. In this section, comparisons of these categories by statistical tests are discussed. The difference between these two categories has been tested according to two main variables: durability and size of houses. Whether a significant relationship exists between these two variables has also been tested. Frequencies and means have been displayed in the form of either simple bar charts or error bar charts, according to the type of test performed.

Once again, as in the sections on statistical tests on financing and implementation (Chapters 4 and 5, Sections 4.6. and 5.5. respectively), because the emphasis of this research is primarily on qualitative aspects and hence the sample was limited to a small number of cases, statistical tests point only to some rudimentary relationships and trends within the sample. For more reliable quantitative results, a larger and more focused sample, perhaps restricting the number of case study locations and housing programmes studied, would be necessary.

6.5.1. Housing design types and durability of house

In a survey of living standards in rural Bangladesh, Sen (1995, pp. 107-109) has ranked housing into several categories, according to durability of house. Because Sen conducted a more extensive quantitative survey with a larger sample than this research, several categorical ranks could be formulated. In this research, because of the smaller sample, a dichotomous categorisation of durability of housing according to whether manufactured materials had been used or not has been followed; if a main part of the structure (i.e. post/foundation, walls or roof) was built of manufactured materials, the house has been categorised as 'more durable', whilst a house built entirely of natural materials was considered 'less durable'. A larger number of categories would not have lent readily to statistical testing. Hence, data for both design types and durability were

available in nominal form, conducive to carrying out the Chi-square test, which tested whether there was a significant difference in durability between agency-designed and self-designed housing in the sample. Because the test showed that the minimum expected frequency was less than 5.0 in more than 20% (i.e. 25%) of the expected frequencies generated, the results of Fisher's Exact Test were considered. According to this test, it was found that the two-tail significance *p* was much smaller than 0.01, indicating a highly significant difference in durability between agency-designed and self-designed houses (Table 6.13.).

Table 6.13. Chi-square of durability according to housing design types

Fisher's Exact Test	Significance *(p)*
Two-Tail	0.00001

The significant difference is obvious from Table 6.14. and Chart 6.1. where all the agency-designed houses (100%) were 'more durable' in nature, that is, had at least one main part of the structure built of manufactured materials. The majority of self-designed houses were 'less durable' (64.3%), being built entirely of natural materials. Because there was a larger number of agency-designed houses in the sample (26 out of 40), all of which were 'more durable', and also as a few self-designed house were 'more durable' (5 out of 14), a composite score shows a high proportion of 'more durable' houses in the sample (77.5%) (Table 6.14., Chart 6.2.).

Table 6.14. Durability of houses according to design type

		Durability of houses		
Type of design	No. of households	More durable No. of houses (%)	Less durable No. of houses (%)	Total (%)
Agency-designed	26	26 **(100.0)**	0 **(0)**	100.0
Self-designed	14	5 **(35.7)**	9 **(64.3)**	100.0
Total no. of houses (n)	40	Composite frequency No. of household (%) 31 **(77.5)**	Composite frequency No. of households (%) 9 **(22.5)**	100.0

Chart 6.1. Durability according to design type

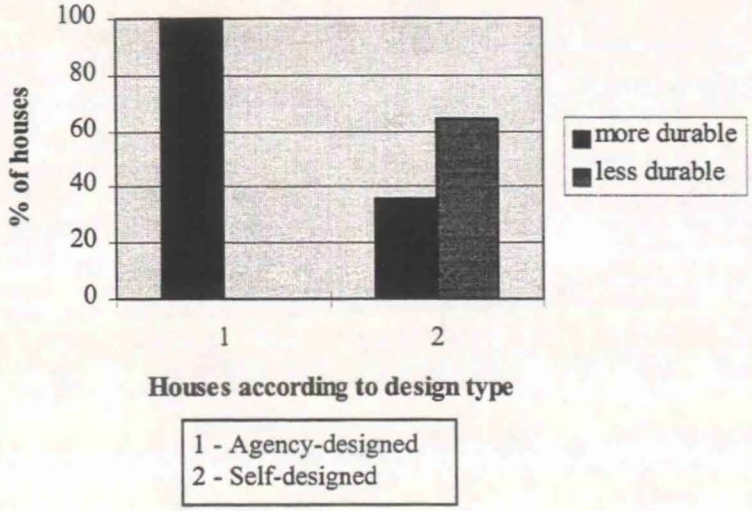
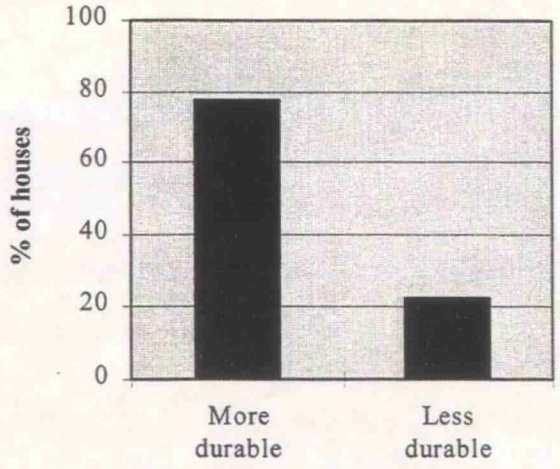


Chart 6.2. Composite frequencies of durability



It should be conceded that the bipartite classification of durability followed here does not render justice to the diversity of housing, both agency-designed and self-designed. The 'less durable' type, consisting of houses built of natural materials, varied considerably in durability of materials used; a bamboo wall is more durable than a jute-stick wall, although both are natural materials. If the 'more durable' type is considered, within the sample at one end there were houses built of *pucca* materials such as brick and concrete and at the other, houses with bamboo walls and CI sheet roofing, both using manufactured materials. Nevertheless, notwithstanding this diversity, houses which have a manufactured material in a main part of the structure are generally more durable than those which do not. Even a CI sheet roof over a house, with the rest of its structure of natural materials, is more durable than a house with a thatched roof. Therefore, in this respect, the cut-off point adopted here is reasonable.

The results of the tests presented above show that all agencies involved in rural housing programmes preferred to build a 'more durable' type of housing. Most of them built with CI sheet roofing. Two main points should be noted. Firstly, improvement of housing, a basic aim of agencies, was based on the concept of building more durable housing. Secondly, the implicit peril of being censured by beneficiaries and other agencies if natural materials were used resulted in avoidance of them. This preoccupation with manufactured products means that, because agencies do not generally choose natural materials in house design, especially for roofing, there is hardly any effort to improve natural materials or any interest in addressing the supply constraint by expanding the natural resource base for building materials. Consequently, agency-designed housing is generally more expensive, and if provided on loan, unaffordable to the very poor. When provided on grant, because of the higher cost, only a limited number of houses can be provided.

The tests also indicate that a number of self-designed houses, albeit a smaller proportion (35.7%), were of the 'more durable' type. All of these had CI sheet roofing. The attraction of this material for low-income populations has been discussed above. Whenever a household can afford to buy CI sheet, that option is adopted, especially for the main dwelling unit. Only very poor households build their main dwelling unit entirely of natural materials.

6.5.2. Housing design types and house size

The size of the house was defined as the built-up area of the main dwelling unit, without extensions such as verandahs. The data for this was available in numerical form, hence t-tests were carried out to investigate if there was a significant difference in size between agency-designed and self-designed housing. The results of the test showed that there was no significant difference between these two groups (Table 6.15.). The means of house size in the two groups were very similar and comparable. The results also indicated the large standard deviation (SD) in the means of both the groups (Table 6.15., Chart 6.3.). This suggests a large variation in size in samples of both agency-built and self-built housing. Chart 6.3. below shows graphically the means of house sizes in both groups with their respective standard deviations.

Table 6.15. Mean size of house by housing design type

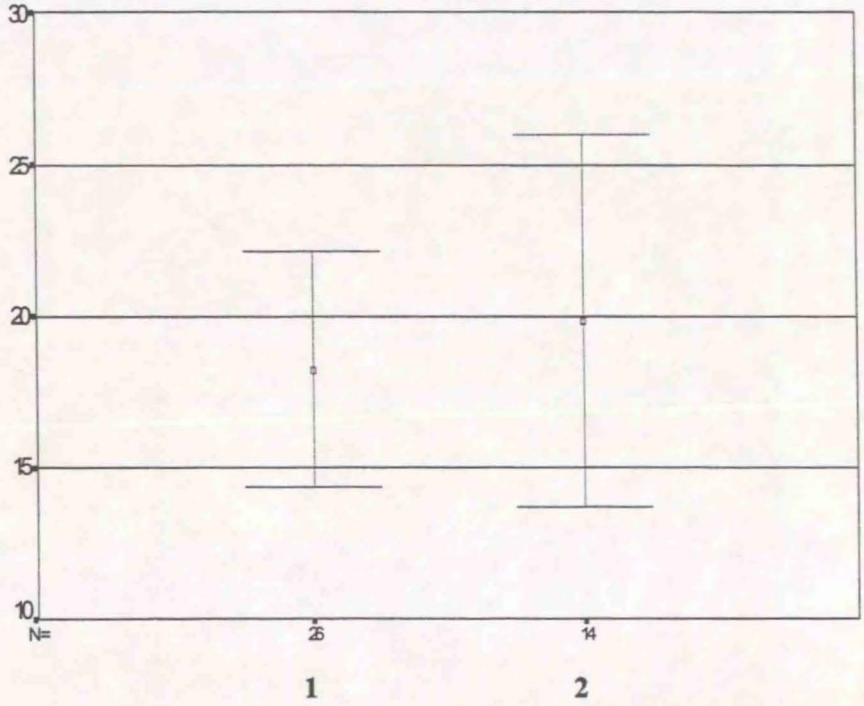
Variable	No. of cases (n)	Mean size (sqm)	SD
SIZE (sqm)			
Agency-designed housing	26	18.2	9.6
Self-designed housing	14	19.8	10.7
Mean difference =	1.6		
2-Tail significance =	0.63		

It appears that most agencies were not concerned about the size of house. An exception is the Grameen Bank (GB) with its stipulated minimum house size of 20 sqm, a size larger than the mean sizes of samples of both agency-designed and self-designed housing. According to a GB staff member, the GB is interested both in instilling a sense of dignity in its beneficiaries and projecting an image of itself as a provider of large and well-built housing, implying a role as contributor to improvement in living standards of low-income households. However, despite a number of GB houses in the sample (5 out of 26, or 19.2%), because many other agencies had built much smaller houses, the mean size of agency-built housing was a low figure.

In grant housing provided by agencies, the size is much below the means presented above: for example, 11.7 sqm for EDM, 13.7 for Caritas, and 13.9 sqm for RDF, WVB and ASA houses (as shown in design drawings in project documents; more or less consistent with field measurements). Beneficiaries of these programmes all complained about the small size of houses and felt constrained by the lack of space. Houses of a standard size were provided irrespective of size of households; for large households, the difficulties that arose are obvious. Because many of these houses were provided free of cost and also because they employed manufactured products or innovative materials, it appears that, to keep costs down, agencies economised on size. Even in houses provided through loans in some programmes, because of the use of manufactured materials, only very small houses could be built, to permit affordability. Examples of this were the 11.7 sqm JBP houses and 13.0 sqm LGED houses (as shown in project documents; consistent with

field measurements). Providing small houses because more expensive manufactured materials were used in the design relates to the preceding section, where the propensity of agencies towards the use of manufactured materials was shown.

Chart 6.3. Mean size of house by housing design type



Notes:

1. Confidence interval = 95%
2. Category (X) axis: Housing design type
   1 = Agency-designed, No. of cases (N_1) = 26
   2 = Self-designed, No. of cases (N_2) = 14
3. Value (Y) axis: Size of house (sqm)

In self-designed housing, size depends on a number of factors. Affordability is an important determinant of size of house, but there are other considerations including size of household; if a household does not require a large house at the present moment, it utilises funds for other household needs, gradually expanding the house when need arises. As with agency-designed housing, there is an inclination to use manufactured products, especially CI sheet, and to some extent RC posts; similarly, use of these materials might sometimes compel a smaller design.

6.5.3. Durability and house size

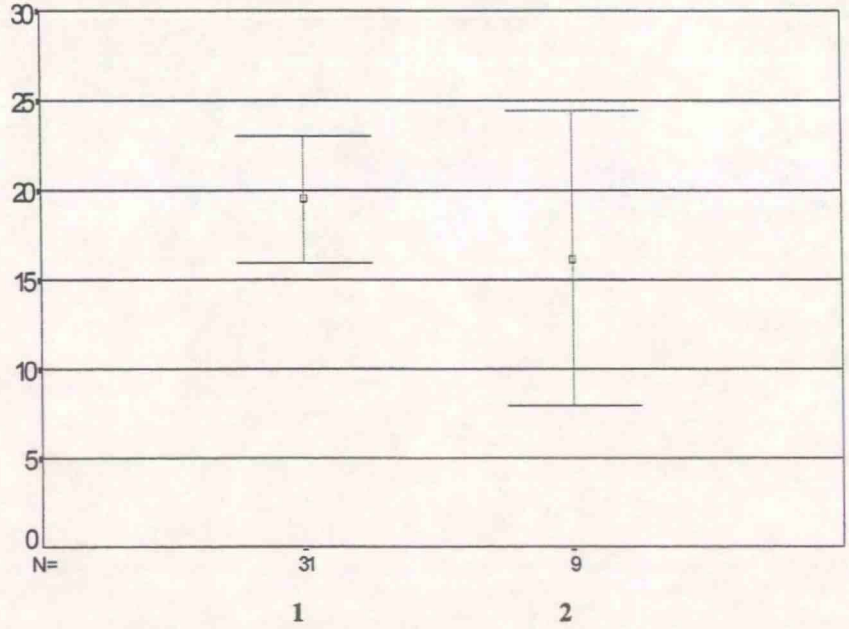
The dichotomous categories of 'more durable' and 'less durable' have been defined earlier in Section 6.5.1. In this section the results of the test are presented to show whether in the sample there is a significant difference in house size according to durability of the house. As numerical figures were available for size, a t-test was carried out. The results of the test showed that there was no significant difference between means of house size in the two durability categories (Table 6.16.). Both groups had comparable and high standard deviation (SD) (Table 6.16., Chart 6.4.).

Only a few cases of very large and very small houses caused the large SD. Chart 6.4. graphically presents the mean and the range of SDs of both groups for visual comparability.

Table 6.16. Mean size of house by durability of house

Variable		No. of cases (n)	Mean size (sqm)	SD
SIZE (sqm)				
More durable		31	19.5	9.7
Less durable		9	16.2	10.7
Mean difference	=	3.3		
2-Tail significance	=	0.38		

Chart 6.4. Mean size of house by durability



Notes:

1. Confidence interval = 95%
2. Category (X) axis: Durability groups
   1 = More durable, No. of cases (N_1) = 31
   2 = Less durable, No. of cases (N_2) = 9
3. Value (Y) axis: Size of house (sqm)

Even though not statistically significant, the results of this test suggest some notable points. It might generally be assumed that better built or more durable houses, the type which agencies provide, rather than the less durable houses built by households themselves, should be larger, an indicator to some extent of an improved standard of living; improvement of this standard is one of the basic aims of agencies involved in community development programmes which often include housing. The above tests showed that houses provided by agencies were generally not larger than self-built houses, although a greater proportion of them were found 'more durable'. This confirms

the inferences drawn in the preceding section: agencies tend to provide more durable houses, economising on cost by making them small.

It is a matter of debate whether a small more durable house offering better protection from the elements and requiring less maintenance is better than a large less durable house with problems in these respects, especially in the context of diminishing natural resources. Beneficiaries of more durable type houses, especially those where CI sheet roofing was used, were generally thankful for the CI sheet, despite complaining about space constraints. A design approach consisting of a small durable house serving as the basic shelter, extensions to which can be built by households according to their particular needs, might prove sensible. However, to judge from the findings of fieldwork and from official reports, it is doubtful if most agencies based their decision to provide small more durable type houses on this design approach. It appears that the decision is usually an outcome of economic and image considerations.

6.6. SUMMARY AND CONCLUSIONS

The question posed at the beginning of this chapter has been the basis of the discussion throughout it, attempting to answer it:

> **What characteristics of design and physical organisation of rural housing in specific contexts best fulfil performance and satisfaction criteria for all stakeholders?**

In seeking answers to this question, issues relevant to organisation of sites, design elements and building materials in the main parts of the house have been examined. A summary of the main findings of this chapter is presented in this section and conclusions are drawn from them. Broader linkages to other chapters and beyond are also considered.

6.6.1. Summary of findings

Some of the main findings presented in this chapter are:

- When planned settlements were examined, it was found that their location was important in determining some of their main characteristics; a good location was important, but often land price was high there, resulting in overcrowding on small sites. Physical planning concepts relating to site-specific house arrangement and adequate provision of infrastructural services were found generally lacking, often resulting in households carrying out adaptations to houses and the site with varying effectiveness. Several divergences existed between planned settlements and those built by communities themselves; principal among them is the tendency for self-built homesteads to be established according to kin with a complex network of social and household links, often lacking in planned settlements. However, changing environmental and social conditions drive towards new settlement patterns; this, along with problems of water supply and sanitation, pose serious impediments to self-built settlements.

- A predominant construction technology introduced by agencies and to a large extent disseminated and assimilated in the rural context is that of RC posts. A flourishing informal sector replication as well as preference for the posts by households as a design element are hallmarks of the acceptance of the technology. Ease of production in the rural context and a less maintenance-intensive alternative to the traditional bamboo post are some of the main factors behind its acceptance. However, its comparatively higher cost presents a problem of affordability for poor households. Transporting, installing, handling and quality control are some of the other problems of the product, suggesting scope for improvement.

- Metal posts have been promoted by some agencies as another alternative. Because the houses studied were built several years ago, this allowed an examination of the performance of this design element after a period of use. It was evident that major problems of deterioration because of climatic conditions, difficulty of maintenance and the almost non-existent possibility of local production, among other factors, generally invalidated most assumptions regarding their potential as a useful design element for low-income rural housing.

- Stilted buildings, a logical solution in a flood-prone region, are however restricted to certain specific regional archetypes, and not widely prevalent. More usual are raised earthen plinths and raised homestead land itself, among other local mechanisms of coping with floods. When agencies attempted to introduce stilted houses, they were unacceptable on cultural grounds because of the lack of precedent; other contextual problems also became evident. Building on stilts is, potentially, a practicable design concept in the context of Bangladesh, but a number of issues need to be resolved before it can be widely applied.

- Building *pucca* or semi-*pucca* type houses is another design concept intended to improve traditional rural housing. However, simply, the use of brick entails a much higher cost, prohibitive for the majority of low-income rural households. Agencies that had built such housing were compelled to limit themselves to a very small house size and to economise on the quality of construction. Hence the results were not entirely satisfactory, especially for occupant households. In addition, the use of brick relates to the macro-environmental issue of biomass fuel consumption, crucial in a context with a high deforestation rate.

- Building with stabilised earth blocks, a much practised 'appropriate technology' in many other developing countries, met with problems when applied in Bangladesh. Earth buildings are localised traditions, often relying on local availability of suitable soil, and problems arose when attempted in other places without thorough technical research. It was found that the cost of stabilised earth blocks is not much lower than of brick, while they are less durable; hence they did not serve very well as a lower cost alternative.

- The innovative notion of chemically treating bamboo to improve its durability is advocated as a solution to scarcity of bamboo. However, the use of toxic chemicals suggests the need for

caution before embracing the idea. Comparability of price with other more well-accepted options, under market conditions found during fieldwork, among other contextual factors, suggests a slim possibility of widespread dissemination. A potentially useful concept, it requires greater care in production and in use before considered viable and hazard-free.

- The promotion of MCR tile as an alternative roofing option, applied in other developing countries with varying degrees of success, met problems in winning over users from the more popular CI sheet. Marketability, quality control, the requirement of imported equipment and training of local builders were some of the main problems. On the other hand, CI sheet, an already familiar material, fulfils the needs of households that can afford it instead of thatching materials. Local acclimatisations of the material to improve its poor thermal qualities indicate its acceptance. Some problems do exist with CI sheet, such as the need for its importation and its presenting a hazard during storms, suggesting scope for further improvement.

In addition to these qualitative observations, a number of findings emerged from quantitative tests. Two main variables were found amenable to statistical testing:

1. Durability of house: Defined operationally in this research, a house was either 'more durable' if a main part of the structure consisted of manufactured materials, or 'less durable' if built entirely of natural materials. Durability is an important design aspect in the choice of building materials and serves as an indicator of living standards, hence it was tested.

2. House size: This is another important aspect of housing design. Since data regarding house size of all the cases in the sample was documented during fieldwork, it was a readily available numerical data source.

These variables were tested for significance of differences between agency-designed and self-designed housing. The relationship between the two variables was also examined. The results of the tests are summarised:

- In the research sample, agency-designed housing was significantly more durable than self-built housing. In fact, all cases of agency-built housing were 'more durable', indicating a reluctance of agencies to build houses entirely of natural materials. There was also a proportion of self-designed housing that was 'more durable', consisting of houses that used CI sheet, indicating the aspiration to 'graduate' from houses built of natural materials.

- House size did not differ significantly between agency-designed and self-designed housing. This can partly be attributed to the propensity of agencies to use manufactured products, raising costs and consequently resulting in economising on size.

- No significant link could be found between durability and house size. This confirmed the previous two points. Because of the tendency to employ durable type manufactured materials, resulting in construction of small houses, although agency-built housing on average tended to be more durable, its mean size was generally comparable to the mean size of houses built by households themselves with their own resources. But it was also found that the latter category had a wide dispersion about the mean, showing that several self-built houses were much larger than most agency-built houses.

6.6.2. Conclusions

Many of the attempts by agencies to improve housing design, reviewed in this chapter, had very little success. Lack of preliminary and localised methodical study, among other factors, resulted in various shortcomings in settlement layout and infrastructure planning. Most of the innovative solutions for structural members such as posts, walls and roofing generally appeared inconsistent with household and community needs, as well as facing problems in responding to the requirements of the context. Many attempts were characterised by good intentions, but lacked in a thorough appraisal of the context and the people for whom they were intended.

Various factors relating to low-income housing need to be considered before effective design concepts can be applied. Most low-income communities face serious problems of access to land and adequate basic services such as water and sanitation. For very poor households, problems in this respect are severely pronounced. Designing housing for low-income communities requires addressing these complexities, necessitating a comprehensive approach.

Despite this, it has been possible to strain out some potentially advantageous design concepts, based on observations of prevailing patterns of rural household acceptance or rejection of particular designs and construction techniques. Two main concepts can be mentioned. Firstly, it appears that RC posts, originally introduced by agencies and so well-accepted in many rural areas, are worth exploring and improving. Important to note is that even RC posts initially met resistance in acceptability, but over time have been accepted in many localities. Whether other innovations might follow a similar route is open to question; it might depend mainly on ease of local production and construction, and on the capacity to respond to household aspirations. Secondly, CI sheet, although not a traditional material, is so well-assimiliated into the local context that it is almost akin to a traditional material. Despite the denunciation of CI sheet in some quarters because of some of its inherent problems, it might be almost impossible to promote alternatives to it. It might simply be prudent to work with the material instead of searching for alternatives, investigating possible approaches to overcome its shortcomings.

In both these examples, commercial entrepreneurship, preponderantly in the informal sector, is instrumental in dissemination of the products. This suggests the importance of agencies establishing links with this sector, already initiated by some agencies. But such links are not sufficient in themselves; it is also important to assess the product being promoted, suggested by

the case of bamboo treatment reviewed in this chapter. Despite successful commercialisation and dissemination, for very poor households both RC posts and CI sheet are prohibitively expensive. They have mainly reached a stratum of the community above the lowest poverty level.

The tendency of agencies to undertake housing programmes for a limited number of households without considering aspects such as possibility for incremental extension of the house, capacities and resources of low-income communities and other important issues in housing design, represent only a temporary alleviation of shelter needs through provision of manufactured materials. While serving to maintain records of achievement of agencies, the overall impact of their programmes is minimal, given the vast scale of need in Bangladesh. Broader issues of natural resource scarcity and vulnerability of households to natural hazards remain largely unaddressed. Lack of involvement of adequate professional expertise generally characterise the domain of well-intentioned but otherwise inadequate endeavours of agencies.

6.6.3. Broader implications

The complexity of the process of housing has necessitated a segmental methodological approach in this research in order to achieve manageability. Nonetheless, the review of housing design concepts in this chapter has implicit links with other important aspects of this study, including financing and implementation. Many of the building materials were costed, showing a clear linkage to means of financing. Another linkage noted was the tendency of agencies to promote innovative designs and materials without adequate consultation with households during or prior to implementation. Such designs often allowed scope for poor quality of construction due to corruption, a subject discussed in Chapter 5. In the next chapter, linkages between important parts of this study are explained in detail.

A specific design element discussed in this chapter shows the difficulties of designing in a developing context. MCR tile is a product extensively and indiscriminately promoted in the developing world as a solution to roofing for low-income housing. Without considering the level of development within specific national and geographic contexts, and local conditions, such promotion is bound to result in varying levels of success, as problems experienced with MCR tile in Bangladesh illustrate. Although many developing countries may possess commonalities, lessons learnt in one context and extrapolated for replication in others requires a high degree of caution in application. A tendency often evident in development studies is to set out broad generalisations to overcome constraints imposed by demands of time and resources in context-specific studies, but this involves the hazard of imposing unworkable 'blanket' solutions. Broader knowledge, refined and modified according to specific contexts through their intensive study, and then applied, has a better chance of success. This is a basic premise on which this research is founded.

- *CHAPTER 7*

CONCLUSIONS

7.1. INTRODUCTION

The conclusions of each previous chapter are presented at its respective end. In this chapter, general conclusions are drawn which provide answers to the main research question:

> **What are the results of strategies to address problems in building low-income rural housing in Bangladesh if these strategies are examined primarily with respect to the views of the main stakeholders in the provision and habitation of housing in terms of fulfilling their requirements?**

To do this, firstly relationships between the three research sub-questions dealing with the themes of financing, implementation and housing design, and their relationship to the main research question are explored. This allows conclusions of previous chapters to be bound together, to draw a set of general conclusions from them. The implications of these conclusions and this study in general are then presented.

7.2. RELATIONSHIPS AND CONCLUSIONS

The three research sub-questions each dealt with an individual main aspect of the housing process - financing, implementation or housing design. Because of the intricacies of the housing process, it was decided to deal with these aspects separately, and due to the analytical approach relationships between them were not presented within individual chapters. It is now necessary to draw out these relationships; they point towards certain conclusions. How they relate conclusively to the main research question is then demonstrated.

7.2.1. Conclusions about the relationship between financing and implementation

In Chapter 4, financing types were classified into three groups: loan, grant or self-financing. That was necessary because of the analytical framework adopted there. Here, financing is re-classified into two main categories - agency-financed or self-financed - corresponding to a similar classification of implementation types. This allows insight into the connections and divergences between agency-supported and non-supported housing and, through this, between agency and community. Agency-financed housing includes both those built with institutional loans and those provided as grant by agencies, whilst self-financed housing consists of those built with household resources or loans from non-institutional sources. Classification of implementation types follows that adopted in Chapter 5, Section 5.2.: agency-built and self-built.

Table 7.1. Distribution of sample households according to financing and implementation types

	Agency-built	Nos	%	Self-built	Nos	%
Agency-financed	6, 11, 12, 13, 14, 20, 21, 22, 23, 24, 26, 27, 29, 30, 32, 33, 34, 35, 37, 39, 40	21	52.5	1, 2, 3, 5, 7, 8, 9, 18, 25, 38,	10	25.0
Self-financed		0	0.0	4, 10, 15, 16, 17, 19, 28, 31, 36	9	22.5

From Table 7.1. it is evident that the largest proportion (52.5%) of households in the research sample had houses financed and built by agencies. All of the agencies that provided grant housing and some of those that gave loans also implemented house construction. The exception to the latter was the Grameen Bank (GB), or other similar loan programmes such as Proshika's; these provided loans to households to build their own houses, included in the group agency-financed/self-built in Table 7.1. Two important points about this group can be highlighted:

- This agency-financed/self-built mode represents a departure from the common agency-financed/agency-built mode. Accompanied by lump sum funds, often difficult for low-income households to obtain, it offers more flexibility and the possibility of the household participating in and maximising its own needs and interests in its own house construction. One of the reasons why many of the agency-financed/agency-built households defaulted on their loans was their lack of involvement during implementation; houses built in this way often did not meet occupant expectations and hence induced reluctance to repay. Thus the agency-financed/self-built mode offers a paradigm worth endorsing and investigating further, to overcome any shortcomings.

- In the group agency-financed/self-built, there were several households that had obtained loans intended for income-generating enterprises from agencies (such as the GB), and utilised them for house construction. These loans were smaller than 'housing loans', and this made them attractive to low-income households, despite their higher interest rate. At the same time, important aspects of the self-built implementation mode were retained, and in some cases even enhanced, by increasing the scope for control by household. This represents a local adaptation of the institutional lending system, and points to the need for a range of loan types to cater to the needs of a greater diversity of households with specific requirements; the problem of reaching the lowest income stratum might perhaps be better addressed in this manner.

All instances of grant housing were agency-built and there were no examples of households being assisted with cash or building material grants. However, the government often distributed CI sheet as post-disaster relief, especially after cyclones or tornados, because of the loss of roofs experienced by many households. Yet in most cases the amount of sheet distributed to a household

was hardly enough to roof an entire house; in some areas, it was observed that households had attached the few pieces of CI sheet obtained to a thatched roof [such as in Sajeda Begum's (HH 38) house], waiting for more funds (or relief) to replace the thatching materials entirely with CI sheet.

Many of the grant housing projects were built as post-disaster rehabilitation. It was often argued by agency staff that after a major disaster, people were so greatly affected that they were not in a condition to engage in participatory implementation of housing projects, hence the choice of a contractor's team. Although potentially beneficial to very poor and vulnerable households, grant housing as a financing method *per se* creates a variety of problems, often causing disruptive rifts and conflict within the community; because of the typical agency-built implementation of grant housing, these problems were often greatly aggravated. The examples of corruption in agency-built housing, cited in Chapter 5, testify to this.

As reiterated when summarising the conclusions drawn from discussion of the first derived question in Section 9.4.1., quantitative tests indicated a strong link between household income and the ability to invest personal resources in improving or extending the house. This points to another connection between financing and implementation: because households with a higher income can invest in house construction or extension, they have a greater opportunity to participate in all aspects during implementation, including selection of construction workers, obviating corruption to a large extent. This suggests that poorer households, if they are to have any new housing, are compelled to accept agency-built housing without being involved during implementation, unable to invest in and adapt to their own needs the house provided, and also unable to overcome shortcomings in the quality of construction due to corruption. It is somewhat ironic that the poor, whom such projects are intended to benefit, often become victims of corruption. However, control during construction and participation may not always be beneficial to a household. For a very poor household, or one without adult male members, participation might easily become a burden. This particular link between income and implementation can easily be overlooked in the rush towards community participation, the dictum of international development agencies.

A somewhat indirect link between financing and implementation, but well worth mentioning, is that of agency support for rural building materials producers or small-scale entrepreneurs. Although not benefiting households directly, these programmes nevertheless inject funds into the local economy and attempt to redress the building materials supply constraint, thereby relieving pressure on household resources for repair and maintenance of housing. Some of the programmes under this scheme, such as MCR tile production and chemically treated bamboo, have inherent problems, but the concept in principle has much to offer.

7.2.2. Conclusions about the relationship between implementation and housing design

In Chapter 5, implementation has been categorised into two main categories: agency-built and self-built. Housing design has been similarly classified in Chapter 6: agency-designed and self-

designed. Table 7.2. below shows distribution of households in the research sample according to these categories of implementation and housing design.

Table 7.2. Distribution of sample households according to implementation and housing design types

	Agency-designed	Nos	%	Self-designed	Nos	%
Agency-built	6, 11, 12, 13, 14, 20, 21, 22, 23, 24, 26, 27, 29, 30, 32, 33, 34, 35, 37, 39, 40	21	52.5		0	0.0
Self-built	1, 2, 8, 9, 18	5	12.5	3, 4, 5, 7, 10, 15, 16, 17, 19, 25, 28, 31, 36, 38	14	35.0

Table 7.2. indicates that the largest proportion of houses (52.5%) were designed and built by agencies. On the other hand, not a single case of agency-built housing followed a design provided by a household. These figures underline a certain point: agencies generally designed and built housing without giving much consideration to seeking design input from the households that benefited from the housing. This resulted in a variety of mismatch, evident in post-construction occupancy, between agency agenda and household requirements. In general, low-income households were considered inept in designs skills compared to professionals; hence the lack of consideration given to their potential design input. Housing designs were prepared by professionals, often in cities (mainly Dhaka) and removed from the rural community - the users of the design. Frequently, designs were prepared by engineers, who, although competent in structural design and construction, had minimal design skills in terms of response to cultural and social aspects of house design. An automatic assumption seemed prevalent: housing built by agencies had to be designed by them.

Once again, an exception was the GB and similar programmes (such as Proshika), the houses in the group agency-designed/self-built. Unlike most other agencies, these two did not implement their own designs, but stipulated an approximation to their design and use of specific building components in self-built housing. Although possessing flaws, this mode allowed the incorporation of household needs and wishes into the design during implementation. Additionally, the design stipulations were not stringent and there was scope for individual interpretation. The variety of GB houses resulting from loosely following a model design testifies to this scope.

The second largest proportion in Table 7.2. was that of the group self-designed/self-built (35%). This does not indicate a mode of operation completely independent of agencies in all houses in this group. Some of the case study households in the group had obtained loans from agencies, but because these loans were not knowingly disbursed for housing, these households had designed and implemented house construction on their own. They did not think that local design and implementation skills relevant to their needs were lacking; what was lacking were funds. Access to

funds made this mode highly satisfactory to them, despite various problems with access to natural building resources and local labour.

In agency-built projects, the reason for employing a contractor was often related to the agency's choice of design. Especially in designs utilising a metal frame, it was imperative to seek the services of a contractor because of the lack of local capacity for production of and construction with metal frames. This implementational decision, determined by design choice, had manifold effects on beneficiaries of these agency-built projects, among which corruption should be highlighted. Additionally, difficulty of maintenance of metal frames largely invalidates them as an useful design option.

Although a statistical Chi-Square test to investigate if there was a connection between replicability and durability (variables of implementation and housing design respectively) did not indicate a significant relationship ($p = 0.12$), it can nonetheless be argued that, in the case of agency-built/agency-designed projects, the use of metal frames, based primarily on durability considerations, resulted in a lack of local replicability of such housing. However, not all durable-type designs were non-replicable. Those using RC posts and CI sheet were replicable, hence the insignificance of the relationship between durability and replicability indicated by the Chi-Square test.

Yet though RC posts have become a locally acceptable design option, their use often entailed problems during implementation, especially with agency-supplied posts, because of difficulties in transport and handling. Households had managed to overcome some of these problems by implementing *in situ* production of RC posts, employing local workers and thus managing implementation of construction and quality control. This may prove instructive to agencies persisting in supplying RC posts. If implementation of a certain design entails making special arrangements, such as training workers and importing equipment, it might be problematic, unless combined with a favourable market and the possibility of the design better meeting local aspirations than existing options, especially with regard to post-project maintenance and local replication; MCR tile is a case in point.

An alternative to the agency-designed/agency-built mode was to support informal sector entrepreneurs as a method of implementing innovatory designs. The dissemination of RC posts and CI sheet through this sector (although unintended by agencies) illustrates the potential of this mode. However, the type of design or technology promoted requires serious assessment. The anecdote of chemically treated bamboo, meant to be used as a building material, instead being adopted for making grain storage bins, highlights this issue. It is reasonable to expect a degree of local adaptation and transformation of a concept, but this example shows it can go far beyond that. An essential component that should feature in both implementation and design is a methodical appraisal of the context and and the community. This research indicated a general lack of this appraisal, resulting in shortcomings in both implementation and design. It was often a

consequence of the lack of involvement of adequate expertise. Compounding this was insufficient technical research and input, glaringly evident in the site-planning cases studied.

7.2.3. Conclusions about the relationship between housing design and financing

The classification of financing types adopted in Section 7.2.1. on financing and implementation is followed in this section: agency-financed and self-financed. This corresponds to a similar classification of housing design types: agency-designed and self-designed. Distribution of the research sample according to these categories of housing design and financing is shown in Table 7.3.

Table 7.3. Distribution of sample households according to housing design and financing types

	Agency-financed	Nos	%	Self-financed	Nos	%
Agency-designed	1, 2, 6, 8, 9, 11, 12, 13, 14, 18, 20, 21, 22, 23, 24, 26, 27, 29, 30, 32, 33, 34, 35, 37, 39, 40	26	65.0		0	0.0
Self-designed	3, 5, 7, 25, 38	5	12.5	4, 10, 15, 16, 17, 19, 28, 31, 36,	19	22.5

From Table 7.3. it can be seen that the largest proportion (65%) of households lived in houses designed and financed by agencies. This indicates the general propensity of agencies to control all aspects of the housing process; it appears that most agencies did not entrust a part of the process to beneficiary households. Especially with respect to design, as mentioned in Section 7.2.2., most agencies did not consider that low-income communities might possess adequate design skills. Hence the tendency to design for them. It was as though, because agencies financed the houses, they regarded designing houses as their right.

On the other hand, for low-income households, the main reason for using agency assistance was the need for funds, not design input. Most felt capable of designing for their own needs as long as funds were available. In grant housing projects, and some credit schemes, this possibility was mostly not considered at all. Only in the GB programme, or the similar one of Proshika, were financing and design modes somewhat flexible, to allow incorporation of household needs to some extent. The size of housing loans, although above a stipulated minimum not always compatible with affordibility for poor households, varied across a range, offering households a degree of choice according to their income. In the GB house design, the choice of wall materials rested with the household and there was flexibility in space layout and arrangement; beyond the stipulated minimum of 20 sqm floor area and the use of four RC posts and CI sheet roofing, there were no other design requirements. However, even such stipulations proved onerous for many households,

mainly on affordability grounds. Thus arose the use of small loans intended for income generation to build less expensive houses, included in Table 7.3. in the group agency-financed/self-designed.

Most of the statistical tests to investigate relationships between variables pertaining to each of the main aspects (e.g. financing, implementation and housing design) did not yield significant results, so it was decided not to discuss them here. Only in the case of the relationship between financing and housing design did some of the statistical tests produce results worth mentioning. A t-test showed a significant link ($p = 0.49$) between income and durability (quantitatives variables of financing and housing design respectively); the higher the income of a household, the more durable its house tended to be. This negates the expressed interest of agencies in providing durable housing to poor households; it seems that, largely, households with moderately stable or relatively higher incomes benefited from such housing. Another t-test strongly, but unsurprisingly, confirmed that durable houses were more expensive (significance of relationship between cost and durability, $p = 0.000$), in line with some of the assertions made in Chapter 6, Section 6.5.1. Despite the rapidly escalating price of most natural materials, a house using a manufactured material in any main part of the structure was substantially more expensive than one entirely built of natural materials. Thus intentions to improve housing by introducing durable components of manufactured materials need careful assessment in terms of their affordability by the poor.

Both variables of financing - income and cost - were found strongly correlated to house size, another variable of design ($p \leq 0.01$). This indicates the tendency, again unsurprisingly, for larger houses to be more expensive and hence affordable only by households with higher incomes. These links between financing and housing design are important: it was often observed that very large households lived in small houses due to poverty, whilst households with better incomes had more space within the house and homestead to accommodate all household members comfortably. Conditions of overcrowding thus brought about by impoverishment manifestly affect the well-being of poor households in powerful ways, a fundamental issue in low-income settlements.

A basic connection between financing and design was the constraint imposed upon design due to lack of sufficient funds. This is perhaps the crux of the problem which gave rise to this study: the difficulty of designing houses, requiring specialised skills to maximise effectiveness of the design within a very limited budget. Complex issues, such as whether less expensive materials requiring frequent replacement are preferable to more expensive ones that might prove cost-effective over the long term, require serious consideration. Low-income households are usually capable of intuitively carrying out such cost-benefit analyses relevant to their own circumstances. However, the design choices for them are severely limited, due to poverty, and they are often victims (albeit not passive) of macro-economic and other factors beyond their control. Polarisation of wealth, natural resources depletion, disasters resulting from human intervention on the environment and eco-system and increasing competition for access to resources are some of the outcomes of weaknesses in public policy. These factors continue to draw low-income rural dwellers into the

vortex of impoverishment, exacerbating the relationship between financial resource constraints and housing design choices.

7.2.4. Conclusions about the relationships between financing, implementation and housing design and the main research question

This research compares agency-supported and non-supported households within the distinct but also inter-related aspects of financing, implementation and housing design, comprising the housing process. These two categories of households served as a key for understanding the results of the main strategies adopted to address problems in building low-income rural housing in Bangladesh, the quintessential concern of this study, expressed in the main research question. During fieldwork, it was found that it was impossible to group all households into these two categories consistently across the three inter-related and main aspects of the housing process - financing, implementation and housing design. A household may have been supported in one or two of these aspects but not in the remaining one(s), producing a range of combinations of modalities. Relationships between financing, implementation and housing design are expressed by these combinations. Understanding them assists in understanding their relationship to the main research question, and suggests answers to it. Table 7.4. below presents these combinations and the corresponding distribution of the research sample. For more detailed reference, in Appendix A.2., Tables A.2.2., A.2.3. and A.2.4., households in the research sample are listed, showing types of financing, implementation and housing design for each household.

Table 7.4. Distribution of sample households according to combinations of financing, implementation and housing design types

COMBINATIONS	HHs	NOS	%
• agency-financed/agency-built/agency-designed	6, 11, 12, 13, 14, 20, 21, 22, 23, 24, 26, 27, 29, 30, 32, 33, 34, 35, 37, 39, 40	21	52.5
• agency-financed/agency-built/self-designed	-	-	-
• agency-financed/self-built/agency-designed	1, 2, 8, 9, 18	5	12.5
• agency-financed/self-built/self-designed	3, 5, 7, 25, 38	5	12.5
• self-financed/agency-built/agency-designed	-	-	-
• self-financed/agency-built/self-designed	-	-	-
• self-financed/self-built/agency-designed	-	-	-
• self-financed/self-built/self-designed	4, 10, 15, 16, 17, 19, 28, 31, 36	9	22.5
TOTAL		**40**	**100.0**

As Table 7.4. shows, the completely intervened group, that is, households living in houses financed, built and designed by agencies, comprised the largest proportion of the sample (52.5%). Because of the interest of this study in investigating housing strategies by agencies which have led to a changing scenario for rural housing, this proportion reflects the choice of sample, and because this research included cases from most of the rural housing programmes in recent operation in Bangladesh, it can be considered representative of the types of agency action in this field. Thus

Appendix A.4.5. Example of manual analytical method with its colour coding for Implementation of houses in the AG programme (HHs 11 and 12, AG staff)

this proportion indicates the nature of operation of most programmes - a top-heavy mode where all the main aspects of the housing process are controlled, managed and undertaken by the agency.

This leaves very little space for the voices of those whom the agencies serve: specific types of loans according to household need, involvement of households during construction according to ability to contribute, or choice of building materials by household, or similar concerns, did not figure high in the agenda of most agencies. This high degree of control, although often advantageous to agencies in terms of administration, satisfies only their requirements as stakeholders in the housing process. Low-income households are longer-term stakeholders, and this study is principally concerned with them. A variety of problems were associated with the agency-financed/agency-built/agency-designed mode, especially from the point of view of households, leading to their dissatisfaction and sometimes conflict within the community or with agency staff. Such a mode therefore is not satisfactory. Alternatives to it are needed, although alternatives should also retain advantages for agencies if they are to fulfil their role as stakeholders, however short-term that might be.

One such alternative originated from the GB, and was also adopted by another agency, Proshika. This pertained to the group agency-financed/self-built/agency-designed in Table 7.4. Here implementation, and partly design, was apportioned to the household, enabling it to control these aspects and partially maximise its needs and wishes. However, there was scope for improving this mode, as various drawbacks recorded during fieldwork suggested. One of its basic weaknesses, pertaining to the only aspect controlled by the agency - financing - was its inability to cater to very poor households.

A response to this, and perhaps an improvement to the GB alternative paradigm, was developed spontaneously through the ingenuity of low-income households without explicit acquiescence of agencies. This was the utilisation of small and affordable income-generating loans for house construction, mentioned above in Section 7.2.1. In this mode, expressed in Table 7.4. as agency-financed/self-built/self-designed, control over the housing process by the household was further expanded, enabling it to build more in accordance with its needs than grant housing. This was just a step short of complete control by household, self-financed/self-built/self-designed as in Table 7.4. Households in this group were not homogeneous; rather they represented two extremes in terms of resources within low-income communities. Households too poor to access agency assistance or in a marginal position (such as living on land without tenure security) were compelled to adopt the complete self-help mode. At the other end of the scale, households economically secure enough not to require help from agencies also adopted this mode.

The outcome of this research is not the tracing of a parabolic trajectory, stating at the outset the problems with which low-income households grapple in housing themselves, and concluding on a contradictory note: that low-income households are best able to solve their own problems. Under the surface of ingenuity, resilience and proficient survival strategies adopted by poor villagers,

seethes the threatening-to-erupt-any-moment lava of vulnerability to natural disaster, depletion of and denial of access to the natural resource base, social exclusion and other impediments affecting their ability to build adequate shelter. There is a potentially useful role for agencies in assisting low-income communities and households in overcoming these obstacles, and these suggest implications for policy. Such implications, together with more general implications of conclusions derived from the findings of this study, are outlined in the following section.

7.3. IMPLICATIONS OF CONCLUSIONS

This study is predominantly founded on empirical research relating to the three main aspects of the housing process - financing, implementation and housing design - findings of which are analysed in Chapters 4, 5 and 6. The analysis focused on problems and advantageous aspects yielding conclusive findings, presented above and at the end of each of these chapters. These conclusions point to certain implications, especially for policy and practice regarding low-income housing programmes in the future. Although presented primarily in terms of these implications, they are also relevant to self-help housing.

7.3.1. Diversified financing for heterogeneous needs

Gaining access to financial sources for house construction presents a formidable difficulty to low-income households. There are local networks and mechanisms for self-financing, but for very poor households these options are often limited and precarious. The emerging phenomenon of agency action promises an alternative, and perhaps some hope, for the future of such households. However, the performance of agencies in this respect leaves much to be desired. Single financing models - loan or grant - each have advantages, but have been found lacking in many respects. This implies the possibility of combining advantageous aspects of different financing models to achieve a diversified and flexible financing policy mix to cater to the heterogenous needs of the rural community.

The rapid horizontal expansion of credit programmes such as the GB's indicates that the phenomenon of institutional credit will continue to be increasingly integrated into the rural milieu. Therefore overcoming shortcomings in this financing model is imperative. However, as observed in this study, the indiscriminate supply of institutional credit in rural areas of Bangladesh has distorted perspectives of communities as well as of agencies. It is therefore important to exercise caution, so that the capacity and initiative of households for self-improvement are not impaired by such indiscriminate provision. The human resources that a household may possess could further the aims of programmes aspiring to promote self-reliance within rural communities, pointing to the possibility of a positive fusion between agency and household aspirations.

Agencies can fulfil an appropriate distributive function, yet achieve financial sustainability, indicated by the example of households utilising for housing income-generating loans. This has has been highlighted repeatedly because it is an important finding, pointing to a potentially valuable financing model for housing: provision of credit to those households not interested in

entrepreneurial activities nor in building a large house, but which can nevertheless repay small loans for building modest houses. There is the further possibility of agencies diversifying loan types to suit the needs of different household types. A variety of loans for building (and also maintenance of) different types of house, according to regional and household need, could be provided. Small loans would also allow a household to undertake incremental upgrading and maintenance, consistent with affordability. This could minimise default by matching affordability to loan size, accompanied by measures to address genuine non-culpable default due to household emergencies. This should not compromise non-charitable organisational agenda; rather, it may qualitatively enhance quantitative recovery performance over the long term.

In addition to the general need for house-building funds, this study found that in post-disaster situations there is the imperative for housing rehabilitation. Agencies often attempt to meet it by provision of grant housing from the influx of international funds supplied as a humanitarian response to disaster. Instead of embarking on wholesale provision of grant housing to produce quantifiable records of utilisation of this funding, as agencies have often done, a strategy of temporary shelter for the most severely affected victims, and in the medium term housing and economic rehabilitation, accompanied by long-term development strategies, would allow greater flexibility and enhanced effectiveness to post-disaster welfare endeavours. In many cases, instead of providing grant housing, it might be better over the long-term to discourage the formation of dependency by assisting households to overcome their predicament themselves.

There are no easy answers to the problems of misallocation of grant housing; local power politics and social patronage structures are much too powerful. Perhaps changes in this regard can be effected by low-income communities forming grassroots associations with a vigilante role. Housing is a high-value and hence coveted commodity; a greater degree of vigilance by the community would be necessary, incorporating special measures against corruption and misallocation. National administration, and also particularly NGOs, should have a strong role in supporting such groups.

Housing should be part of a co-ordinated and integrated development effort. For that, it is important to envisage a financing policy mix: a mix of different types of grants and loans, dependent on a household's economic position. To implement this financing model with variability according to household economic profile, detailed needs assessment, stemming from knowledge of and involvement with the community, would be essential. Communities themselves are often best able to inform policy. With their input, agency programmes could mobilise and support communities to arrive at appropriate ways of financing housing.

7.3.2. Streamlined implementation through wider channels of community participation

Problems in agency-built housing, including corruption, inappropriate choice of construction technologies and poor maintenance subsequent to implementation, were found linked largely to the limited nature of participation of and consultation with beneficiaries and the community.

Despite generally widespread endorsement of the participatory project implementation mode, agencies were found lacking in its understanding, at least in the field of housing. Most projects that incorporated community or household participation did so in a minimal sense.

Ways of involving the community from the beginning and in policy decisions, not only as a device for economising on labour cost during construction, as often done, are needed. Although participation can sometimes prove onerous for vulnerable households, for the majority, especially if involved from the earliest stage of the project, it can be a means to avoid becoming victims of corruption, especially in contractor-built projects. Indeed, the strategy of employing contractors, especially from outside the locality, must be questioned, primarily on grounds of the corruption typically evidenced. Since only if unfamiliar and locally non-replicable building technologies are chosen are the services of a contractor needed, the use of such technologies should generally be discouraged. They create a variety of associated problems. Local building skills could generally be used, benefiting the local economy. Small technical improvements could be incorporated, providing the opportunity to train local builders (and also to learn from them), aiding effective dissemination of skills and knowledge within the community and sharing of experiences.

The link between post-disaster rehabilitation and long-term development (or the 'emergency-development continuum' as it is commonly called) needs to be recognised; in a disaster-prone context such as Bangladesh, the distinction - or the link - is usually blurred. A disaster can present the occasion to introduce and promote safer building techniques. However, these need to be sustained and local NGOs are often in a position to do this by enhancing local capacities. Because of past experiences, 'relief culture' might have become endemic in some areas, and it is necessary for agencies to find ways to overcome it by not raising expectations that might retard community self-help.

A method of implementation which attempts to involve members of the local community is support of small-scale rural building materials producers or entrepreneurs. This is an alternative to a completely extraneous mode. A leader in this field is Proshika, although its choice of building components - MCR tile and treated bamboo - has serious drawbacks. But such an initiative could prove worthwhile to other agencies, such as the GB, involved in rural housing as a long-term development endeavour. In addition to local employment generation, the benefit to agencies would be reduction of overhead costs in operating their own building component production units. The money could be better utilised in promoting quality control and the accountability of small entrepreneurs through supervision by agency staff. Local producers could also serve as construction specialists for *in situ* production of building components; beneficiaries of partly self-built programmes such as the GB's repeatedly expressed a preference for this. It would overcome problems in transporting heavy components such as RC posts. Nonetheless, it is as yet at a rudimentary stage, and a great deal of research and improvement is necessary before proclaiming it as a viable option. Despite this, it might be worthwhile to explore prospects for what appears a possible way of introducing/increasing community involvement..

Even though this study is restricted to housing, it should be borne in mind that low-income rural housing cannot be effectively implemented as an isolated programme. It should be part of a larger community development programme, well-integrated with other components of such a programme. Most NGOs, especially the larger ones with an array of programmes, are in a position to integrate housing into their overall development effort. There is a need to develop this idea, both as a strategy to improve overall programmes and for better implementation of housing projects.

7.3.3. Contextual housing design relevant to local needs

In this study settlements and construction of housing have been studied, and many of the strategies followed by agencies in these respects have indicated weaknesses. On the other hand, although local household/community approaches are contexually more appropriate, low-income rural communities and their environment are undergoing changes presenting problems which undermine such resourcefulness. There is thus scope for improvement in both agency and community effort, perhaps only possible through a united effort by both these stakeholders.

Effective physical planning of settlements requires specialised experience, often best achieved by a multi-disciplinary team composed of members who can provide input into diverse and distinct aspects of a complex exercise. Both the GB and AG programmes studied could benefit from such an approach, instead of employing inappropriate personnel and the same pool of staff for a variety of tasks, for many of which they were not trained. There are lessons to be learnt from traditional or self-built settlements; professionals cannot operate effectively without such lessons. A two-way interactive model of operation is needed, both agency and community benefiting from each other's experience, instead of the typical agency-driven, generally top-down, models used so far.

Water supply and sanitation are two of the most crucial issues in settlement planning. With the problem of arsenic poisoning of sub-soil water, other sources need to be harnessed. Bangladesh has a high annual rainfall and it is a waste not to utilise this readily available resource. Techniques of rainwater collection and storage have been developed and applied in many other developing countries (for example, see UNICEF *undated*; ITDG 1996b) and have potential for adaptation to Bangladesh. For agencies, the task is to disseminate lessons from these experiences through local consultation and input. Further, despite many problems with the use of sanitary toilets, some effective approaches have been identified, such as the WVB toilet design discussed in Section 6.3.1.2. Use of sanitary toilets is generally not widespread in low-income rural communities, and its promotion to improve health and hygiene requires a combined effort at awareness creation to achieve these benefits. Nevertheless, there is also evidence of change: households such as Lota Bala's (HH 28) obtain and use sanitary toilets on their own initiative (see Section 6.3.2.4.), perhaps an indication of more widespead future adoption.

In a context of transition and scarcity of natural building materials, two non-traditional building components have been found consistently popular: RC posts and €I sheet. Despite various

drawbacks, both offer several advantages to rural households. There is scope for improvement of these components, in some cases already indicated by households, such as covering CI sheet roofing with an insulative layer and *in-situ* production/improvisation of RC posts. The growing popularity of RC posts presents the opportunity to design them less expensively and lighter-weight, without compromising quality, thus offering possibilities of collaborative efforts between professionals and communities.

However, the main problem with components of manufactured materials is their higher cost than most natural building materials, often a prohibitive factor to their use by poor households. Thus there is a strong need to search for less expensive alternatives, more affordable and achievable for a wider section of the rural population. Agencies can play an important role in this regard by assisting communities to develop such alternatives. Often potentially valuable ideas to which they do not have access exist outside the rural community, and agencies with their wider contacts can assist in obtaining and disseminating such ideas. An example mentioned in Chapter 6, Section 6.4.3.2. is that of more hazard-resistant roof construction, already applied in other developing countries. Again, instead of supplanting natural materials with components of manufactured materials, improvement of natural materials might offer affordable and contextual solutions. There has hardly been a concerted effort at working with natural materials to improve them qualitatively, an unexplored field with potentially useful possibilities. Most attempts pertaining to improvement of natural materials, such as stabilised earth and chemically treated bamboo, are as yet confined to the research stage, or as evident from the examples studied, applied in deficient ways. There is great scope for work here.

Perhaps more important than the construction improvements suggested above is the need for regeneration of the natural resource base through conservation and improved management. Several afforestation programmes are active in Bangladesh, but hardly any evidence of linking these (or awareness of the potential to do so) with production of building materials (such as bamboo) was found. Efforts to do so in a systematic combined approach towards afforestation, production of building materials and improvement of their durability could be woven into the rural economy and ecology, offering a greater range of alternatives of building materials for low-income households.

7.4. FURTHER RESEARCH AND NEW DIRECTIONS

Although this study pertains mainly to the Bangladeshi context, it has implications and raises queries relevant to the study of the built environment in the developing world. Perhaps many of its findings would be similar to those elsewhere, in which case it confirms their validity. Nevertheless, some of the findings point towards new knowledge in the field and prompt questions for further research with wider relevance. Three basic points, relating to the main themes of this study, can be highlighted:

- Although micro-credit for income generation similar to the GB model has been replicated widely, there is very little known about the applicability and potential for institutional housing

loans for low-income housing. Does it point towards a replicable model for institutional action? Housing is generally believed to be a low priority compared to income generation, but the use of income-generating loans for housing suggests a need to reflect on the nature of priority-allocation by low-income households. Is it a context-bound feature? Does it vary with household profile?

- Participatory development models have been widely endorsed and applied, but the nature of participation in a context of widespread corruption is not very well-known. This study has investigated this unexplored aspect relating to community participation and found it to have a strong bearing. Is there scope for participatory housing implementation by mitigating corruption? Or is corruption a contextual feature to be considered and accepted? Can it be incorporated within the practice of participation?

- Housing design in a context of declining natural resources and increasing aspiration for status and permanence is a widely studied topic in many forms in different parts of the developing world. Yet this study shows unique findings with wider relevance. The informal sector, robust in most developing countries, has been found in Bangladesh to play an important role in commercialising and disseminating new building products. Yet this sector is often not included directly in efforts to introduce improved construction in the developing world. What links can be formed between this sector and agencies? Problems are bound to arise in such links - what is their nature and how can they be addressed?

Even within the Bangladeshi context, there is great scope for further research. Although this research covered the majority of agency-based housing programmes in Bangladesh, a case study approach to the locations of projects and selection of household respondents had to be adopted because of limitations of time, resources and the need for intensive focus group discussions with households. Therefore there is a need for a more inclusive extension of this research, using a larger team over a longer period of time, perhaps with several team members residing in rural locations for more extended periods. The research team should be composed of members from both social and technical disciplines, as well as fieldworkers and local builders, and should consist of a combination of men and women team members. Regions not covered in this research, such as Sylhet, Khulna and Jessore districts, may provide additional insights and perspectives. An inventory of available resources and building materials, such as bamboo and thatching materials, or supply of cement and CI sheet in specific regions, should be prepared. Perhaps more rigorous quantitative methods would need to be employed, to deal with a much larger and diversified sample than in this research.

As evident in this research, many of the problems identified were not so much technical in nature as outcomes of larger social, economic and political processes. These structural linkages, although presented and analysed to some extent in this research, need more thorough investigation to suggest how best to overcome constraints on low-income housing imposed by them. This requires

systematic social science-based inquiry and research. Forging an inter-disciplinary-based approach should be a prime requisite of further research, lending it a fresh dimension. So far, research has been conducted separately on apparently inter-related topics in Bangladesh by different disciplines; now integration is needed.

A recent example, and perhaps representing a new paradigm is the work of the UK-based Housing and Hazards (H&H) Group (not dealt with in this study because no housing projects have yet been built), which has undertaken a long-term initiative of professional/academic research combined with field research into low-income housing, attempting to draw together a diverse group of individuals with experience in the field. It is also linked to a community development programme in Dinajpur district in northern Bangladesh. Further, a link has recently been established between universities in the UK and Bangladesh, and with the Grameen Trust (a subsidiary body within the GB). Despite some problems, perhaps inevitable in such an endeavour, this, the first programme of its kind which seeks to develop ideas for improvement of rural housing that are achievable, affordable and best relate to the circumstances of low-income communities, contrasts with the programmes of agencies studied in this research. The long-term results of the work of the H&H group are as yet unavailable, but it is hoped that its exploratory investigations will contribute towards addressing housing problems of the rural poor (see Ahmed and Carter 1999 and Ahmed and Hodgson 1997, where some of the aspects of the H&H group are discussed).

Bangladesh represents a microcosm of the developing world, especially that of the least developed countries, where problems of a similar nature are manifest. Therefore, transcending its national boundaries, findings of this research should have value in other similar contexts and should be able to contribute to the general field of development studies and the specific context of the built environment. The size and scale of problems in most developing countries are so overwhelming that it is an exceedingly severe task for any agency to address them comprehensively. Notwithstanding the critical analysis presented throughout this study, it must be acknowledged that the bridge between policy and practice for most agencies is laden with difficulties which are varied, complex and manifold, as are the obstacles facing low-income communities. The scope of this research did not permit of adequate attention to the complexity and full range of the topic. Its suggestions are also bound to encounter problems when considered for application in actual conditions. To put them into practice will require building on cumulative experience, expanding in perhaps as yet unforeseen directions and seeking worthwhile ways to approach housing problems as part of a wider pattern of development, if they are to overtake the pace of intensification of housing problems of low-income households worldwide.

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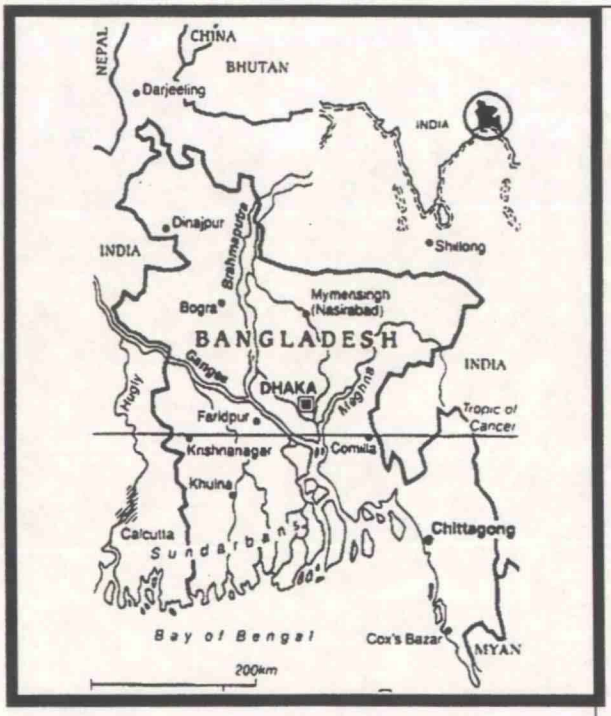
APPENDIX A.1. BANGLADESH: NATIONAL PROFILE

(Compiled from: BBS 1993; BBS 1997; Gunthorp 1998; Haq 1997; ITM 1997; Monan 1995; UNDP 1997; World Bank 1997)



BASIC FACTS

Land area: 147,570 sqm
Capital: Dhaka
GNP per capita: US $240
Currency: Taka (in 1997, approximately £1 = Tk 73, $1 = Tk 45)
Population: 119,768,000 (>800 persons/sqm)
Literacy: 37% (male 48%, female 25%)
Language: Bengali (*Bangla*)

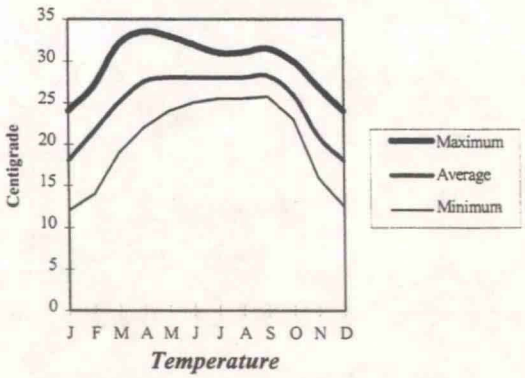
Religion:	Muslim	88.30%	Hindu	10.51%
	Buddhist	0.59%	Christian	0.33%
	Other	0.27%		

Note: The above data is from a report on the last 1991 national population census (BBS 1993, p. XIII). Unofficial sources dispute the estimate for Muslim population in government publications in the light of past records of government-supported human rights abuse of minority groups, suggesting that the cumulative proportion of non-Muslim populations might be up to 25% (Timm 1991, p. 9).

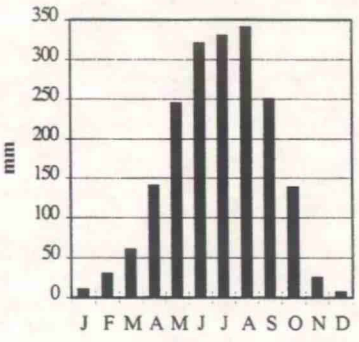
History: Closely linked to history of the Indian sub-continent. Turko-Afghan rulers of the 13th century AD brought Islam. Ruled by the Moghuls (16th - mid 18th century AD) and then the British (mid 18th - mid 20th century AD). End of British colonial rule in 1947 resulted in the creation of India and Pakistan as two separate states; Pakistan was divided into West and East Pakistan, separated by a distance of more than 1600 kms. In 1971 East Pakistan seceded, resulting in formation of Bangladesh as an independent nation. Several post-independence political assassinations and military regimes; first democratic election in 1991, Khaleda Zia elected as Prime Minister. She was replaced in the 1996 elections by Sheikh Hasina, daughter of assassinated founder of the nation Sheikh Mujibur Rahman.

Environment: Predominantly comprised of alluvial land, the major part of the land is a large delta formed by alluvial sedimentation by three main rivers - the Ganges (locally known as *Padma* or *Podda*), Brahmaputra (or Jamuna) and Meghna - and their numerous tributaries (estimated 230 rivers including tributaries), flowing into the Bay of Bengal in the south. The southern part of the country is mostly composed of islands formed by the river systems. Nearly 70% of the land is comprised of the flat flood-plains (elevation of Dhaka = 8 m). There is hilly terrain in the south-east and the northern region is relatively dry and at a higher elevation than the flood-plains. The deltaic land is subject to annual floods, sometimes of catastrophic proportions. The all-pervading wetness of the environment lends this region its special character. In the past this was a verdant land with lush vegetation and forests, but widespread deforestation has occurred over time, compounded by population pressure; less than 10% of the nation is presently forested.

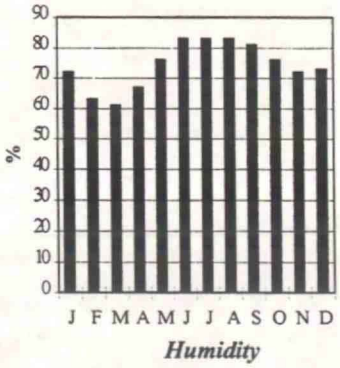
Climatic data for 1997



Temperature



Rainfall



Humidity

APPENDIX A.2. INFORMATION ON THE HOUSEHOLD (HH) SAMPLE

Table A.2.1. Basic profiles of households (HH) and sample summaries

HH NO	PROGRAMME	LOCATION (District)	NAME OF MAIN RESPONDENT	SEX	AGE	RELIGION	HOUSEHOLD MEMBERS	AVERAGE HOUSEHOLD INCOME (Tk/month)	YEAR OF CONSTN.
1	GB	Dinajpur	Tushar Bala	Female	30	Hindu	7	5,000	1992
2	GB	Dinajpur	Proshad Chandra Ray	Male	40	Hindu	5	800 (very low income)	1992
3	GB	Dinajpur	Bhorosha Bala	Female	35	Hindu	2	1,500	1992
4	None	Dinajpur	Jagannath Ray	Male	35	Hindu	5	1,200	1995
5	GB/ gen. loan	Dinajpur	Bhorosha Bala	Female	28	Hindu	4	1,000	1996
6	CCDB	Manikganj	Vanu Akhtar	Female	38	Muslim	10	5,000	1989
7	CCDB/gen. loan	Manikganj	Alaya Khatun	Female	30	Muslim	5	800 (very low income)	1995
8	GB	Manikganj	Naz Jahan	Female	19	Muslim	8	2,000	1993
9	GB	Manikganj	Moinu Mia	Male	30	Muslim	5	5,000	1993
10	None	Manikganj	Sharmila Begum	Female	30	Muslim	5	700 (very low income)	1992
11	AG	Dinajpur	Shudipto Chandra Ray	Male	50	Hindu	2	1,000	1993
12	AG	Dinajpur	Rohima Khatun	Female	40	Muslim	7	1,500	1993
13	JBP-LGED	Bhola	Mohammed Ejaz	Male	28	Muslim	4	2,500	1993
14	JBP-LGED	Bhola	Kajol Mia	Male	45	Muslim	7	800 (very low income)	1994
15	None	Bhola	Jamal Alam	Male	30	Muslim	4	2,500	1990
16	Proshika/ bamboo trtmnt.	Dhamrai	Rashid Ali	Male	62	Muslim	8	3,500	1987
17	Proshika/ bamboo trtmnt.	Dhamrai	Momota Begum	Female	27	Muslim	5	2,000	1977
18	Proshika	Dhamrai	Lokman Mia	Male	38	Muslim	5	4,500	1992
19	None	Dhamrai	Koruna Rani Shutradhar	Female	30	Hindu	4	2,000	1994
20	EDM	Saturia	Ehsan Ali	Male	50	Muslim	1	700 (very low income)	1993
21	EDM	Saturia	Borhan Uddin	Male	70	Muslim	2	1,000	1989
22	EDM/ sold off	Saturia	Shahjalal Ali	Male	40	Muslim	7	1,500	1989
23	ASA	Tangail	Nazmul Islam	Male	25	Muslim	4	2,000	1996
24	ASA	Tangail	Laila Khatun	Female	40	Muslim	2	2,000	1996
25	GB/ gen.loan	Tangail	Jahanara Khatun	Female	30	Muslim	8	1,500	1997
26	ETDA-LGED	Faridpur	Enamul Ali	Male	60	Muslim	4	3,500	1994

27	ETDA-LGED	Faridpur	Ashim Gaine	Male	45	Christian	12	2,500	1993
28	None	Faridpur	Lota Bala	Female	25	Christian	6	2,500	1997
29	RDF	Noakhali	Jasmin Ara	Female	25	Muslim	3	700 (very low income)	1993
30	RDF	Noakhali	Masuda Khatun	Female	26	Muslim	4	3,000	1993
31	None	Noakhali	Mofizul Haq	Male	26	Muslim	4	2,500	1997
32	Caritas	Tangail	Shehab Ali	Male	65	Muslim	2	1,000	1996
33	Caritas	Tangail	Anis Ali	Male	55	Muslim	5	2,000	1996
34	AG-WVB	Chittagong	Jannatara Islam	Female	45	Muslim	7	2,000	1990
35	AG-WVB	Chittagong	Shopon Mia	Male	48	Muslim	10	4,500	1990
36	None	Chittagong	Shaheda Khatun	Female	45	Muslim	4	3,000	1992
37	AG-WVB	Cox's Bazar	Sajjad Ullah	Male	55	Muslim	9	4,500	1988
38	Proshika/ gen. loan	Cox's Bazar	Sajeda Begum	Female	50	Muslim	8	2,500	1994
39	LGED	Chittagong	Porimol Kumar Jolodas	Male	48	Hindu	8	3,500	1991
40	WVB/ sold off	Faridpur	Banu Khatun	Female	35	Muslim	6	1,000	1989
Total= 40	GB=5+2 CCDB=1+1 AG= 2 JBP-LGED=2 Proshika=3+1 EDM=3 ASA=2 ETDA-LGED=2 RDF=2 Caritas=2 AG-WVB/ WVB=4 LGED=1 None =7	Dinajpur=7 Manikganj=5 Bhola=3 Dhamrai=4 Saturia=3 Tangail=5 Faridpur=4 Noakhali=3 Chittagong= 4 Cox's Bazar=2		F=19 M=21	Av.=39.3 15-20=1 >20-30=15 >30-40=9 >40-50=7 >50-60=3 >60=3	Muslim=30 Hindu=8 Christian=2 Other=None	Av.= 5.475 1-3 = 7 4-7 = 24 8-10 = 8 >10 = 1	Av. = 2267.5 <1,000 = 6 1,000-2,000 = 17 >2,000-3,000 = 8 >3,000-4,000 = 3 >4,000-5000 = 6 >5,000 = None	Before 1990=7 1990-93=19 1994-97=14

Note: *Names of respondents have been altered and names of villages have not been revealed to protect privacy of respondents*

Table A.2.2. Summaries of programme and other characteristics in the household (HH) sample

HH NO	NAME OF AGENCY	TYPE OF AGENCY	TYPE OF PROGRAMME	LOCATION (DISTRICT)	FINANCING	IMPLEMENTATION	HOUSING DESIGN/CONSTRUCTION	NO. OF HOUSEHOLDS IN LOCATION
1	GB	Bank	On-going	Dinajpur	Loan	Some components supplied, partly self-built	4 RC posts, earth walls, CI roof	5
2	GB	Bank	On-going	Dinajpur	Loan	Some components supplied, partly self-built	4 RC posts, bamboo frame and walls, CI roof	
3	GB	Bank	On-going	Dinajpur	Loan	Self-built	Layered earth walls, bamboo structure, wheat straw verandah roof (no R.C posts)	
4	-	-	-	Dinajpur	Self-financed	Self-built	*Gola* house, bamboo, wattle-and-daub, thatch roof, bamboo cross-bracing	
5	GB/ general loan	Bank	On-going	Dinajpur	General loan from GB	Self-built	*Shapra* house, wattle-and-daub on bamboo, bamboo structure, mono-pitch CI roof, rice-straw covers on sides	
6	CCDB	NGO	Post-flood rehabilitation	Manikganj	Grant	Contractor-built,household partly involved	Timber posts on cement blocks, bamboo walls, CI sheet roof	2
7	CCDB/ general loan	NGO	On-going	Manikganj	General loan from CCDB	Self-built	Bamboo posts, rushes (*bon*) walls, CI roof, polythene-sandwich roof on verandah	
8	GB	Bank	On-going/ Post-riverbank erosion rehabilitation	Manikganj	Loan	Some components supplied, partly self-built	4 RC posts, timber posts, bamboo posts on verandah, bamboo walls, CI sheet roof on timber frame	3
9	GB	Bank	On-going/ Post-riverbank erosion rehabilitation	Manikganj	Loan	Some components supplied, partly self-built	4 RC posts, timber posts, CI walls, CI roof, timber frame	
10	-	-	-	Manikganj	Self-financed and loan from brother	Self-built	Thatch roof, rushes (*bon*) walls, bamboo frame	
11	AG	Govt	On-going/ settlement of landless on govt land	Dinajpur	Grant	Contractor-built, then provided	4 RC posts, bamboo posts and walls, verandah CI roof on bamboo posts, CI roof on bamboo/timber frame	2
12	AG	Govt	On-going/ settlement of landless on govt land	Dinajpur	Grant	Contractor-built, then provided	4 RC posts, bamboo postsand walls, verandah CI roof on bamboo posts, mud wall, jute sticks, CI roof on bamboo/ timber frame	
13	JBP-LGED	NGO-Govt	On-going	Bhola	Loan	Contractor-built, household partly involved	6RC posts, bamboo walls, timber siseboad added, CI roof on timber frame	3
14	JBP/ LGED	NGO-Govt	On-going	Bhola	Loan	Contractor-built, household partly involved	6 RC posts, bamboo walls, CI roof on timber frame	

15	-	-	-	Bhola	Loan from uncle	Self-built	*Supari* palm tree posts, bamboo support s for loft, palm fronds walls, *supari* frame for roofand walls, rice-straw thatch	
16	Proshika/ bamboo treatment	NGO	On-going	Dhamrai	Self-financed	Self-built, through rural entrepreneur support	RC posts, treated bamboo walls, CI walls, jute sticks walls, CI roof on timber frame	4
17	Proshika/ bamboo treatment	NGO	On-going	Dhamrai	Self-financed	Self-built, through rural entrepreneur support	Bamboo posts, treated bamboo walls on 3 sides, 1 side untreated, CI roof without frame	
18	Proshika	NGO	Discontinued	Dhamrai	Loan	Some components supplied, partly self-built	6 RC posts, bamboo posts, CI walls, bamboo ceiling, CI roof on timber frame	
19	-	-	-	Dhamrai	Self-financed	Self-built	Bamboo walls and posts (untreated), CI roof without frame	
20	EDM	NGO	Post-tornado rehabilitation	Saturia	Grant	Contractor-built, household partly involvd	Compressed earth blocks, GI pipe posts inside walls, timber door and window, MCR tile roof	3
21	EDM	NGO	Post-tornado rehabilitation	Saturia	Grant	Contractor-built, household partly involved	MS pipe posts, bamboo posts, bamboo , wild grass (*bon*), jute sticks walls, CI roof on timber frame (*garjan*)	
22	EDM/ sold off	NGO	Post-tornado rehabilitation	Saturia	Grant	Contractor-built, household partly involved; later self-built	SOLD OFF EDM HOUSE. Presently: Bamboo and tree trunk posts, rushes (*bon*) walls, thatch roof on bamboo frame	
23	ASA	NGO	Post-tornado rehabilitation	Tangail	Grant	Contractor-built, household partly involved	Bamboo posts and ties, bamboo walls, CI roof on timber frame	3
24	ASA	NGO	Post-tornado rehabilatation	Tangail	Grant	Contractor-built, household partly involved	Bamboo posts and ties, bamboo walls, timber door, CI roof on timber frame	
25	GB/ gen. loan	Bank	On-going	Tangail	General loan from GB	Self-built	Bamboo and timber posts, bamboo walls, CI wall on 1 side, bamboo ties, CI roof on timber frame	
26	ETDA-LGED	NGO-Govt	Pilot stage	Faridpur	Loan	Contractor-built, household partly involved	Cement plinth, 8 cm brick wall, timber door, steel windows, ferro-cement roof	3
27	ETDA-LGED	NGO-Govt	On-going, but discontinued in some areas	Faridpur	Loan	Contractor-built	6RC posts, bamboo walls, timber door, CI roof on timber frame	
28	-	-	-	Faridpur	Self-financed	Self-built	8 RC posts, walls: CI, bamboo, plywood, jutesticks, CI roof on timber frame	
29	RDF	NGO	Post-cyclone rehabilitation	Noakhali	Grant	Contractor-built, household partly involved	4 RC posts, bamboo posts, bamboo walls, MCR tile on timber frame	3
30	RDF	NGO	Post-cyclone rehabilitation	Noakhali	Grant	Contractor-built, household partly involved	4RC posts, bamboo posts, bamboo walls, CI wall in front, MCR tile on timber frame	
31	-	-	-	Noakhali	Loan from moneylender	Self-built	Bamboo posts, rushes (*koicha*) walls with mud plastser at bottom, rice straw thatch on bamboo roof frame	
32	Caritas	NGO	Post-tornado rehabilitation	Tangail	Grant	Contractor-built, household partly involved	6 RC posts, bamboo posts, bamboo walls, CI roof on MS angle frame	

33	Caritas	NGO	Post-tornado rehabilitation	Tangail	Grant	Contractor-built, household partly involved	6 RC posts, bamboo posts, bamboo walls, CI roof on MS angle frame	2
34	AG-WVB	Govt-NGO	On-going/ settlement of landless on govt land	Chittagong	Grant	Contractor-built, then provided	6 MS angle posts and MS angle roof frame, bamboo posts, bamboo walls, CI roof	3
35	AG-WVB	Govt-NGO	On-going/ settlement of landless on govt land	Chittagong	Grant	Contractor-built, then provided	6 MS angle posts and MS angle roof frame, bamboo posts, bamboo walls, CI roof (in extension: bamboo posts, bamboo walls, mud walls, thatch roof)	
36	-	-	-	Chittagong	Funds from sale of former house in Noakhali	Self-built	6 RC posts, mud walls, part bamboo wall, aesbestos roof on timber frame	
37	AG-WVB	Govt-NGO	On-going/ settlement of landless on govt land	Cox's Bazar	Grant	Contractor-built, then provided	6 MS pipe posts and MS angle roof frame, bamboo walls with CI lower section, mud walls, CI roof, CI roof on timber frame on ver	2
38	Proshika/ general loan	NGO	-	Cox's Bazar	General loan from Proshika	Self-built	Bamboo posts, mud walls, bamboo walls, thatch and CI roof, thatch and plastic roof on ver	
39	LGED	Govt	Post-cyclone rehabilitation	Chittagong	Loan	Contractor-built, household partly involved	3 RC posts on ver, 13 cm brick walls, timber doors and windows, *kutcha* floor, CI roof on timber frame	1
40	WVB	NGO	Post-flood rehabilitation	Faridpur	Grant	Contractor-built, household partly involved; later self-built	SOLD OFF WV HOUSE. Presently: Bamboo posts, jute-stick walls, CI roof	1

***Note**: Complete names of agencies are given below in Appendix A.4.*

Table A.2.3. Information on the household (HH) sample used for quantitative analysis

HH No	Financing type	Income (Tk/month)	Cost (Tk)	Personal investment (Tk)	% Income	% Invest	Implementation type	Preference	Replicability	Design type	Durability	Size (sqm)
2	1	800	14500	3000	7	25	2	1	1	1	1	18.58
3	1	1500	14000	6000	11	43	2	1	1	2	1	26.10
4	3	1200	5000	5000	24	100	2	-	1	2	2	10.71
5	1	1000	5000	3000	20	60	2	2	1	2	2	9.49
6	2	5000	50200	200	10	0	1	2	1	1	1	15.18
7	1	800	4000	0	20	0	2	1	1	2	2	12.24
8	1	2000	22800	10800	9	47	2	2	1	1	1	22.61
9	1	5000	26000	14000	19	54	2	2	1	1	1	20.64
10	1	700	1200	700	58	58	2	-	1	2	2	7.63
11	2	1000	12500	500	8	4	1	2	1	1	1	18.04
12	2	1500	17000	5000	9	29	1	2	1	1	1	15.93
13	1	2500	27950	9950	9	36	1	2	1	1	1	23.49
14	1	800	19600	1600	4	8	1	1	1	1	1	12.07
15	1	2500	2000	0	125	0	2	2	1	2	2	15.62
16	3	3500	15825	15825	22	100	2	2	2	2	1	26.43
17	3	2000	4000	4000	50	100	2	2	2	2	2	17.67
18	1	4500	35000	27500	13	79	2	2	1	1	1	23.06
19	3	2000	4500	4500	44	100	2	2	1	2	2	16.38
20	1	700	8700	200	8	2	1	2	2	1	1	12.60
21	2	1000	17000	5000	6	29	1	1	2	1	1	12.04
22	2	1500	12000	0	13	0	1	1	2	1	1	11.70
23	2	2000	16700	2100	12	13	1	1	1	1	1	14.55
24	2	2000	15100	500	13	3	1	2	1	1	1	14.09
25	1	1500	13000	8000	12	62	2	2	1	2	1	37.92
26	1	3500	30500	8000	11	26	1	2	2	1	1	13.11
27	1	2500	22700	3200	11	14	1	2	1	1	1	11.95
28	3	2500	5500	5500	45	100	2	2	1	2	1	16.58
29	2	700	11700	1200	6	10	1	2	2	1	1	12.90
30	2	3000	12040	1540	25	13	1	2	2	1	1	12.24
31	1	2500	2300	300	109	13	2	1	1	2	2	12.74

32	2	1000	13200	200	8	2	1	1	2	1	1	14.62
33	2	2000	13810	810	14	6	1	1	2	1	1	14.06
34	2	2000	16000	1000	13	6	1	2	2	1	1	17.15
35	2	4500	37000	22000	12	59	1	2	2	1	1	58.59
36	3	3000	20000	20000	15	100	2	2	1	2	1	24.90
37	2	4500	20000	5000	23	25	1	2	2	1	1	22.10
38	1	2500	16000	11000	16	69	2	1	1	2	2	43.40
39	1	3500	56000	1000	6	18	1	2	1	1	1	31.62
40	2	1000	8500	0	12	0	1	2	2	1	1	10.78

Legend	
Financing type	1 - Loan 2 - Grant 3 - Self-financed
Implementation type	1 - Agency-built 2 - Self-built
Design type	1 - Agency-designed 2 - Self-designed
Preference *(for implementation type)*	1 - Agency-built 2 - Self-built
Replicability	1 - Replicable 2 - Not replicable
Durability	1 - More durable 2 - Less durable

Table A.2.4. Distribution of the household (HH) sample according to main categories of financing, implementation and housing design

	FINANCING		IMPLEMENTATION		HOUSE DESIGN	
CASE NO	Agency-financed	Self-financed	Agency-built	Self-built	Agency-designed	Self-designed
1	•			•	•	
2	•			•	•	
3	•			•		•
4		•		•		•
5	•			•		•
6	•		•		•	
7	•			•		•
8	•			•	•	
9	•			•	•	
10		•		•		•
11	•		•		•	
12	•		•		•	
13	•		•		•	
14	•		•		•	
15		•		•		•
16		•		•		•
17		•		•		•
18	•			•	•	
19		•		•		•
20	•		•		•	
21	•		•		•	
22	•		•		•	
23	•		•		•	
24	•		•		•	
25	•			•		•
26	•		•		•	
27	•		•		•	
28		•		•		•
29	•		•		•	
30	•		•		•	
31		•		•		•
32	•		•		•	
33	•		•		•	
34	•		•		•	
35	•		•		•	
36		•		•		•
37	•		•		•	
38	•			•		•
39	•		•		•	
40	•		•		•	

APPENDIX A.3. INTERVIEW SCHEDULES

- **Interview Schedule A.3.1. Beneficiaries**
- **Interview Schedule A.3.2. Non-Beneficiaries**
- **Interview Schedule A.3.3. Operational Staff of Agencies**

Interview Schedule A.3.1. Beneficiaries

- **Semi-structured interview/discussion: Beneficiaries (B)**

HOUSING DESIGN (BV3) Project: Date:

BV3a	**Local construction skills**
BV3a1	Were constn. workers from this area or from outside (where?)?
BV3a2	Are there local workers who can build such houses? (Depending on answer to BV3a1)
BV3a3	Does beneficiary think that workers involved knew their work well?
BV3a4	Can such a house be built in this area without the help of agencies?
BV3b	**Installation/Construction**
BV3b1	Were any problems faced during construction?
BV3b2	Specific problems faced with each bldg. component? (Itemise)
BV3b3	How long did construction take?
BV3b4	Does beneficiary think that time taken for construction was appropriate? (Could it have b done in less time or should more time been allowed)
BV3c	**Climatic fit**
BV3c1	Where did beneficiary live during last rainy season?
BV3c2	(If this house) How was it to live here?
BV3c3	Does beneficiary (and family) spend much time indoors when it gets very hot?
BV3c4	Where did beneficiary live during last flood?
BV3c5	(If this house) How was it to live here?

- **Semi-structured interview/discussion: Beneficiaries (B)**

FINANCING (BV1) Project: Date:

BV1a	**Affordability**
BV1a1	In which year was this house built?
BV1a2	Does beneficiary know the cost?
BV1a3	What was the cost of former house (if any)?
BV1a4	In which year was former house built?
BV1a5	Would it have been possible to build a house without funding? (Explore: e.g. what kind of house, etc.)
BV1a6	How much personal funds invested? (Itemise: during and after construction)
BV1a7	Does beneficiary think that the funds provided by agency were adequate?
BV1a8	How much time and labour input by beneficiary?
BV1a9	In case beneficiary loses or faces damage to house (e.g. in disasters) how would they replace or repair it?

BV1b	**Disbursement/Acquisition of funds/house**
BV1b1	Provided cash (part or full) for construction?
BV1b2	How was money made available?
BV1b3	How much time between application for funds/ house and provision?
BV1b4	How much time between when house was needed and when built?
BV1b5	Where did beneficiary and family reside in interim period?
BV1b6	Problems due to delay (if any) in disbursement?
BV1c	**System of financing**
BV1c1	(If grant) Could agency have provided a better house with same money?
BV1c2	(If loan) What are sources for loan repayment?
BV1c3	(If loan) Problems in paying back loans?
BV1c4	(If loan) If any problem in repayment, how does beneficiary cope?
BV1c5	Given the scope would beneficiary prefer grant or loan?
BV1c6	What rights does the beneficiary have regarding landownership, house ownership, sale/excha etc.?

BV1c7	What are the long-term obligations and restrictions?
BV1d	**Paperwork**
BV1d1	Did beneficiary have to fill in form or sign contract? (Find out about process)
BV1d2	Where (how far)?
BV1d3	Difficulties in travelling for paperwork?
BV1d4	Deed for plot?
BV1d5	Could beneficiary easily read and understand contract and deed?
BV1d6	If not, who helped?

Summary notes on FINANCING (BV1):

- **Semi-structured interview/discussion: Beneficiaries (B)**

IMPLEMENTATION (BV2) Project: Date:

BV2a	**Beneficiary selection**
BV2a1	How was beneficiary selected?
BV2a2	Difficulties in being selected?
BV2a3	Were there others who applied at the same time (how many)?
BV2a4	How many were selected or rejected?
BV2a5	Why were any applicants rejected?
BV2a6	Contact with any rejected applicants? (If so, what kind of relationship?)
BV2b	**Supply of bldg. materials/components**
BV2b1	Where did components come from? (Itemise all)
BV2b2	What were the costs of components? (Itemise)
BV2b3	How were components transported to site? (Itemise)
BV2b4	Difficulties in transporting?

BV2b5	Difficulties in acquiring components?
BV2b6	Where did component manufacturers obtain materials supply?
BV2b7	Did manufacturers face difficulties with materials supply?
BV2b8	Can these components be manufactured locally without help of agency?
BV2c	**Beneficiary participation**
BV2c1	Before house was built did beneficiary know what type of house would be built?
BV2c2	Who designed/planned the building?
BV2c3	Was there consultation and meetings with agency before and during house construction?
BV2c4	Were meetings adequate and enough time and attention was given?
BV2c5	If and how was the house design communicated (e.g. drawings, examples, etc.)?
BV2c6	Did beneficiary take part in construction of house, and if so, to what extent?
BV2c7	Was beneficiary glad to take part in construction or would have preferred agency to build (or vice-versa)?
BV2c8	Who chose site location?

BV2c9	How far is site from market, work-place and other necessary places?
BV2d	**Technical supervision**
BV2d1	Were any engineers (or any other constn. related person) involved?
BV2d2	Does beneficiary think that they (constn. persons) knew enough about construction?
BV2d3	Were there agency staff (non-technical) involved?
BV2d4	Were they (agency staff) useful?
BV2e	**Post-constn. monitoring/ maintenance**
BV2e1	Do agency staff visit house after it has been built?
BV2e2	How often (how many times have they visited after completion of house)?
BV2e3	Do they show interest in condition of house?
BV2e4	Does beneficiary face problems with condition of house?
BV2e5	Has beneficiary mentioned these problems (if any) to agency staff?
BV2e6	What was the agency staffs' response to these problems?
BV2e7	Who maintains the house?
BV2e8	Does the agency help in maintenance?

Summary notes on IMPLEMENTATION (BV2)

- **Semi-structured interview/discussion: Beneficiaries (B)**

HOUSING DESIGN (BV3) Project: Date:

BV3a	**Local construction skills**
BV3a1	Were constn. workers from this area or from outside (where?)?
BV3a2	Are there local workers who can build such houses? (Depending on answer to BV3a1)
BV3a3	Does beneficiary think that workers involved knew their work well?
BV3a4	Can such a house be built in this area without the help of agencies?
BV3b	**Installation/Construction**
BV3b1	Were any problems faced during construction?
BV3b2	Specific problems faced with each bldg. component? (Itemise)
BV3b3	How long did construction take?
BV3b4	Does beneficiary think that time taken for construction was appropriate? (Could it have been done in less time or should more time been allowed)
BV3c	**Climatic fit**
BV3c1	Where did beneficiary live during last rainy season?
BV3c2	(If this house) How was it to live here?
BV3c3	Does beneficiary (and family) spend much time indoors when it gets very hot?
BV3c4	Where did beneficiary live during last flood?
BV3c5	(If this house) How was it to live here?

BV3c6	When was the most recent storm in this area?
BV3c7	Was beneficiary living in this house?
BV3c8	(If this house) How was it to live here?
BV3c9	Is the orientation of the house suitable?
BV3d	**Cultural fit**
BV3d1	Where and how does beneficiary (and family) perform religious rituals in the house/homestea
BV3d2	Is the space adequate?
BV3d3	Where and how does beneficiary carry out daily basic activities (e.g. cooking, eating, sleep toilet, etc.)?
BV3d4	Is the space adequate?
BV3d5	Where and how does the family spend time together in the house/homestead?
BV3d6	Is the space adequate?
BV3d7	Where and how does the family receive guests? (Itemise male-female differences)
BV3d8	Is the space adequate?
BV3d9	Does the family do other work in the house/homestead (e.g. income-generating, etc.)?
BV3d10	Is the space adequate?
BV3e	**Site-planning**
BV3e1	Who was responsible for site-planning?
BV3e2	Was the site prepared adequately to prevent flooding and to allow drainage?

BV3e3	Does the site layout and location offer protection from natural (e.g. wind, rain, sun, animals) and human (e.g. robbery) dangers?
BV3e4	What is the relation of the site to its surroundings?
BV3e3	Were plots laid out so that necessary privacy is achieved?
BV3e4	How accessible is the site?
BV3e5	Does the site layout allow for necessary outdoor activities?
BV3f	**Flexibility**
BV3f1	Did beneficiary make any modifications to the house?
BV3f2	(If any) Why were they needed?
BV3f3	Is the house better after making modifications?
BV3f4	Were there any problems in making modifications?
BV3f5	Would any changes be required in the future?
BV3f6	Would it be easy to make future changes?

Summary notes on HOUSING DESIGN (BV3):

Interview Schedule A.3.2. Non-Beneficiaries

Structured interview: Non-Beneficiary Group (C) Sheet 1

SL	INFORMATION REQUIRED	INFORMATION RECORDED
C1	Proximity to housing programme	
C2	Location	
C3	Construction type	
C4	Name of houseowner (Full name in capitals)	
C5	Address	
C6	Sex	
C7	Age	
C8	Religion	
C9	No. of household members with relationships and ages	
C10	Total household income with sources (Sensitive topic, structured questionaire may not be suitable, may need to employ semi-structured inquiry to circumspect, i.e.: • Amount of land owned (impt.) • Range of income categories • No. of earners • No. of dependents • Sources of income • Type - steady or occasional	

Note: For the sake of confidentiality, the name and other personal details may not be disclosed in the thesis. These will be documented mainly for the convenience of the researcher.

CV3c6	When was the most recent storm in this area?
CV3c7	Was houseowner living in this house?
CV3c8	(If this house) How was it to live here?
CV3c9	Is the orientation of the house suitable?
CV3d	**Cultural fit**
CV3d1	Where and how does houseowner (and family) perform religious rituals in the house?
CV3d2	Is the space adequate?
CV3d3	Where and how does houseowner carry out daily basic activities (e.g. cooking, eating, sleepi toilet, etc.)?
CV3d4	Is the space adequate?
CV3d5	Where and how does the family spend time together in the house?
CV3d6	Is the space adequate?
CV3d7	Where and how does the family entertain guests? (Itemise male-female differences)
CV3d8	Is the space adequate?
CV3d9	Does the family do other work in the house (e.g. income-generating, etc.)?
CV3d10	Is the space adequate?

CV1b	Disbursement/Acquisition of funds/house
CV1b1	Did houseowner save money to build house?
CV1b2	Saving from what sources?
CV1b3	How much time between when money began to be saved and when house was built?
CV1b4	How much time between when house was needed and when built?
CV1b5	Where did houseowner and family reside in interim period?
CV1b6	Problems due to delay (if any) in acquisition of funds?
CV1c	**System of financing**
CV1c1	Could houseowner have built a better house with the money spent?
CV1c2	If obtained funds from external sources, does houseowner have to pay it back?
CV1c3	Is there any interest on repayment?
CV1c4	Problems in paying back?
CV1c5	If any problem in repayment how does houseowner cope?
CV1c6	Given the scope, would houseowner accept a loan or grant instead of building with own funds?

CV1c7	What rights does the houseowner have regarding landownership, house ownership, sale/excha etc.?
CV1c8	What are the long-term obligations and restrictions?
CV1d	**Paperwork**
CV1d1	Does houseowner have a deed for plot/house?
CV1d2	Where was that obtained?
CV1d3	Difficulties in travelling for paperwork?
CV1d4	Could houseowner easily read and understand contract and deed?
CV1d5	If not, who helped?

Summary notes on FINANCING (CV1):

- **Semi-structured interview/discussion: Non-Beneficiary Group (C)**

IMPLEMENTATION (CV2) Location: _____ Date: _____

CV2a	**Beneficiary selection**
CV2a1	Why did houseowner not opt for or was not selected as a beneficiary in a housing programme?
CV2a2	Difficulties in not being selected?
CV2a3	Were there others who applied at the same time (how many)?
CV2a4	How many were selected or rejected?
CV2a5	Why were any applicants rejected?
CV2a6	Contact with any beneficiaries? (If so, what kind of relationship?)
CV2b	**Supply of bldg. materials/components**
CV2b1	Where did materials/components come from? (Itemise all)
CV2b2	What were the costs of components? (Itemise)
CV2b3	How were materials/components transported to site? (Itemise)
CV2b4	Difficulties in transporting?

CV2b5	Difficulties in acquiring materials/components?
CV2b6	Where did component manufacturers obtain materials supply?
CV2b7	Did manufacturers face difficulties with materials supply?
CV2c	**Houseowner participation**
CV2c1	Before house was built did houseowner know what type of house would be built?
CV2c2	Who designed/planned the building?
CV2c3	Was there consultation and meetings with building specialists (if any) before and during hou construction?
CV2c4	Were meetings adequate and enough time and and attention was given?
CV2c5	If and how was the house design communicated?
CV2c6	Did houseowner take part in construction, and if so, to what extent?
CV2c7	Was houseowner glad to take part in construction or would have preferred others to build (or vic versa)?
CV2c8	Who chose site location?
CV2c9	How far is site from market, work-place and other necessary places?

CV2d	**Technical supervision**
CV2d1	Were there any constn. related persons involved?
CV2d2	Does houseowner think that they (constn. persons) knew enough about construction?
CV2e	**Post-constn. monitoring/maintenance**
CV2e1	Does houseowner sometimes need to call the constn. specialists? Do they come on their own?
CV2e2	How often (how many times have they visited after completion of house)?
CV2e3	Do they show interest in condition of house?
CV2e4	Does houseowner face problems with condition of house?
CV2e5	Has houseowner mentioned these problems (if any) to the specialists?
BV2e6	What was the specialists' response to these problems?
BV2e7	Who maintains the house?
BV2e8	Do the specialists help in maintenance?

Summary notes on IMPLEMENTATION (CV2):

- **Semi-structured interview/discussion: Non-Beneficiary Group (C)**

HOUSING DESIGN (CV3) Location: Date:

CV3a	**Local constn. skills**
CV3a1	Were constn. workers from this area or from outside (where?)?
CV3a2	Are there local workers who can build such houses? (Depending on answer to CV3a1)
CV3a3	Does houseowner think that workers involved knew their work well?
CV3a4	Does houseowner think that houses could be better built with the help of agencies?
CV3b	**Installation/Construction**
CV3b1	Were any problems faced during construction?
CV3b2	Specific problems faced with each bldg. component? (Itemise)
CV3b3	How long did construction take?
CV3b4	Does houseowner think that time taken for construction was appropriate? (Could it have b done in less time or should more time been allowed)
CV3c	**Climatic fit**
CV3c1	Where did houseowner live during last rainy season?
CV3c2	(If this house) How was it to live here?
CV3c3	Does houseowner (and family) spend much time indoors when it gets very hot?
CV3c4	Where did houseowner live during last flood?
CV3c5	(If this house) How was it to live here?

CV3c6	When was the most recent storm in this area?
CV3c7	Was houseowner living in this house?
CV3c8	(If this house) How was it to live here?
CV3c9	Is the orientation of the house suitable?
CV3d	**Cultural fit**
CV3d1	Where and how does houseowner (and family) perform religious rituals in the house?
CV3d2	Is the space adequate?
CV3d3	Where and how does houseowner carry out daily basic activities (e.g. cooking, eating, sleeping, toilet, etc.)?
CV3d4	Is the space adequate?
CV3d5	Where and how does the family spend time together in the house?
CV3d6	Is the space adequate?
CV3d7	Where and how does the family entertain guests? (Itemise male-female differences)
CV3d8	Is the space adequate?
CV3d9	Does the family do other work in the house (e.g. income-generating, etc.)?
CV3d10	Is the space adequate?

CV3e	**Site-planning**
CV3e1	Who was responsible for site-planning?
CV3e2	Was the site prepared adequately to prevent flooding and to allow drainage?
CV3e3	Does the site layout and location offer protection from natural (e.g. wind, rain, sun, animals) human (e.g. robbery) dangers?
CV3e4	What is the relation of the site to its surroundings?
CV3e3	Were plots laid out so that necessary privacy is achieved?
CV3e4	How accessible is the site?
CV3e5	Does the site layout allow for necessary outdoor activities?
CV3f	**Flexibility**
CV3f1	Did houseowner make any modifications to the house?
CV3f2	(If any) Why were they needed?
CV3f3	Is the house better after making modifications?
CV3f4	Were there any problems in making modifications?
CV3f5	Would any changes be required in the future?
CV3f6	Would it be easy to make future changes?

Summary notes on HOUSING DESIGN (CV3):

Interview Schedule A.3.3. Operational Staff of Agencies

SV3e3	Do site layouts and locations offer protection from natural (e.g. wind, rain, sun, animals) and human (e.g. robbery) dangers?
SV3e4	What is the relation of sites to its surroundings?
SV3e3	Were plots laid out so that necessary privacy is achieved?
SV3e4	How accessible are the sites?
SV3e5	Do the site layouts allow for necessary outdoor activities?
SV3f	**Flexibility**
SV3f1	Did beneficiaries make any modifications to the houses?
SV3f2	(If any) Why were they needed?
SV3f3	Are house better after making modifications?
SV3f4	Were there any problems in making modifications?
SV3f5	Would any changes be required in the future?
SV3f6	Would it be easy to make future changes?

Summary notes on HOUSING DESIGN (SV3):

- **Semi-structured interview/discussion: Operational Staff (S)**

FINANCING (SV1) Project: Date:

SV1a	**Affordability**
SV1a1	In which years were the houses built? (Relate to particular years according to beneficiaries' answers)
SV1a2	What is the average cost of houses in the programme?
SV1a3	What was the average cost of former houses (if any)?
SV1a4	In which years were former houses built?
SV1a5	Would it have been possible for beneficiaries to build houses without funding? (Explore: e.g. what kind of house, etc.)
SV1a6	How much personal funds have beneficiaries invested? (Itemise: during and after construction)
SV1a7	Does staff think that the funds provided by agency were adequate?
SV1a8	How much time and labour input by beneficiaries?
SV1a9	In case beneficiaries lose or face damage to house (e.g. in disasters) how would they replace or repair it?

SV1b	**Disbursement/Acquisition of funds/house**
SV1b1	Were beneficiaries provided cash (part or full) for construction?
SV1b2	How was money made available?
SV1b3	How much time between application for funds/ houses and provision?
SV1b4	How much time between when houses were needed and when built?
SV1b5	Where did beneficiaries and families reside in interim period?
SV1b6	Problems due to delay (if any) in disbursement?
SV1c	**System of financing**
SV1c1	(If grant) Could agency have provided better houses with same money?
SV1c2	(If loan) What are sources for loan repayment?
SV1c3	(If loan) Problems in paying back loans?
SV1c4	(If loan) If any problem in repayment, how do beneficiaries cope?
SV1c5	Does staff think it is better to provide grant or loan?

SV1c6	What rights do beneficiaries have regarding landownership, house ownership, sale/exchange, etc.?
SV1c7	What are the long-term obligations and restrictions?
SV1d	**Paperwork**
SV1d1	Did beneficiaries have to fill in form or sign contract? (Find out about process)
SV1d2	Where (how far)?
SV1d3	Difficulties for beneficiaries in travelling for paperwork?
SV1d4	Deed for plot?
SV1d5	Could beneficiaries easily read and understand contract and deed?
SV1d6	If not, who helped?
SV1d7	Does staff consider the paperwork onerous?

Summary notes on FINANCING (SV1):

- **Semi-structured interview/discussion: Operational Staff (S)**

IMPLEMENTATION (SV2) Project: Date:

SV2a	**Beneficiary selection**
SV2a1	How were beneficiaries selected?
SV2a2	Difficulties in selecting beneficiaries?
SV2a3	Were there many people who applied at the same time (how many)?
SV2a4	How many were selected or rejected?
SV2a5	Why were any applicants rejected?
SV2a6	Contact with any rejected applicants? (If so, what kind of relationship?)
SV2b	**Supply of bldg. materials/components**
SV2b1	Where did components come from? (Itemise all)
SV2b2	What were the costs of components? (Itemise)
SV2b3	How were components transported to site? (Itemise)
SV2b4	Difficulties in transporting?

SV2b5	Difficulties in providing components?
SV2b6	Where did component manufacturers obtain materials supply?
SV2b7	Did manufacturers face difficulties with materials supply?
SV2b8	Can these components be manufactured locally without help of agency?
SV2c	**Beneficiary participation**
SV2c1	Before house was built did beneficiaries know what type of house would be built?
SV2c2	Who designed the buildings (background, intentions, etc.)?
SV2c3	Consultation and meetings with beneficiaries before house was built?
SV2c4	Were meetings adequate and enough time and attention given?
SV2c5	If and how were the house designs communicated (e.g. drawings, examples, etc.)?
SV2c6	Did beneficiaries take part in construction of house, and if so, to what extent?
SV2c7	Is staff glad that beneficiaries took part in construction or preferred agency to build (or vice-versa)?
SV2c8	Who chose site locations?
SV2c9	How far are sites from market, work-place and other necessary places?

SV2d	**Technical supervision**
SV2d1	Were there any engineers (or any other constn. related person) involved?
SV2d2	Did they encounter any problems?
SV2d3	Were there agency staff (non-technical) involved?
SV2d4	Did they encounter any problems?
SV2e	**Post-constn. monitoring/maintenance**
SV2e1	Do agency staff visit houses after they have been built?
SV2e2	How often (how many times have they visited after completion of houses)?
SV2e3	What is staff's impression of condition of houses? (Try to assess interest)
SV2e4	Do beneficiaries face problems with condition of houses?
SV2e5	Have beneficiaries mentioned these problems (if any) to agency staff?
SV2e6	Was it possible for agency to do something about these problems?
SV2e7	Who maintains the houses?
SV2e8	Does the agency help in maintenance?

Summary notes on IMPLEMENTATION (SV2):

SV2b5	Difficulties in providing components?
SV2b6	Where did component manufacturers obtain materials supply?
SV2b7	Did manufacturers face difficulties with materials supply?
SV2b8	Can these components be manufactured locally without help of agency?
SV2c	**Beneficiary participation**
SV2c1	Before house was built did beneficiaries know what type of house would be built?
SV2c2	Who designed the buildings (background, intentions, etc.)?
SV2c3	Consultation and meetings with beneficiaries before house was built?
SV2c4	Were meetings adequate and enough time and attention given?
SV2c5	If and how were the house designs communicated (e.g. drawings, examples, etc.)?
SV2c6	Did beneficiaries take part in construction of house, and if so, to what extent?
SV2c7	Is staff glad that beneficiaries took part in construction or preferred agency to build (or vice-versa)?
SV2c8	Who chose site locations?
SV2c9	How far are sites from market, work-place and other necessary places?

SV2d	Technical supervision
SV2d1	Were there any engineers (or any other constn. related person) involved?
SV2d2	Did they encounter any problems?
SV2d3	Were there agency staff (non-technical) involved?
SV2d4	Did they encounter any problems?
SV2e	**Post-constn. monitoring/maintenance**
SV2e1	Do agency staff visit houses after they have been built?
SV2e2	How often (how many times have they visited after completion of houses)?
SV2e3	What is staff's impression of condition of houses? (Try to assess interest)
SV2e4	Do beneficiaries face problems with condition of houses?
SV2e5	Have beneficiaries mentioned these problems (if any) to agency staff?
SV2e6	Was it possible for agency to do something about these problems?
SV2e7	Who maintains the houses?
SV2e8	Does the agency help in maintenance?

Summary notes on IMPLEMENTATION (SV2):

SV3e3	Do site layouts and locations offer protection from natural (e.g. wind, rain, sun, animals) and human (e.g. robbery) dangers?
SV3e4	What is the relation of sites to its surroundings?
SV3e3	Were plots laid out so that necessary privacy is achieved?
SV3e4	How accessible are the sites?
SV3e5	Do the site layouts allow for necessary outdoor activities?
SV3f	**Flexibility**
SV3f1	Did beneficiaries make any modifications to the houses?
SV3f2	(If any) Why were they needed?
SV3f3	Are house better after making modifications?
SV3f4	Were there any problems in making modifications?
SV3f5	Would any changes be required in the future?
SV3f6	Would it be easy to make future changes?

Summary notes on HOUSING DESIGN (SV3):

- **Semi-structured interview/discussion: Operational Staff (S)**

HOUSING DESIGN (SV3) Project: Date:

SV3a	**Local constn. skills**
SV3a1	Were constn. workers from this area or from outside (where?)?
SV3a2	Are there local workers who can build such houses? (Depending on answer to SV3a1)
SV3a3	Does staff think that workers involved knew their work well?
SV3a4	Can such a house be built in these areas without the help of agencies?
SV3b	**Installation/Construction**
SV3b1	Were any problems faced during construction?
SV3b2	Specific problems faced with each bldg. component? (Itemise)
SV3b3	How long did construction take for each house?
SV3b4	Does staff think that time taken for construction was appropriate? (Could it have been done in less time or should more time been allowed)
SV3c	**Climatic fit**
SV3c1	Where did beneficiaries live during last rainy season?
SV3c2	(If same houses) How was it to live there?
SV3c3	Do beneficiaries (and families) spend much time indoors when it gets very hot?
SV3c4	Where did beneficiaries live during last flood?
SV3c5	(If same houses) How was it to live there?
SV3c6	When was the most recent storm in the area?

SV3c7	Were beneficiaries living in the houses?
SV3c8	(If same houses) How was it to live there?
SV3c9	What is the staff's opinion about the orientation of the houses?
SV3d	**Cultural fit**
SV3d1	Where and how do beneficiaries (and families) perform religious rituals in the houses?
SV3d2	Is the space adequate?
SV3d3	Where and how do beneficiaries carry out daily basic activities (e.g. cooking, eating, sleep toilet, etc.)?
SV3d4	Is the space adequate?
SV3d5	Where and how do the families spend time together in the house?
SV3d6	Is the space adequate?
SV3d7	Where and how do the families entertain guests? (Itemise male-female differences)
SV3d8	Is the space adequate?
SV3d9	Do the families do other work in the house (e.g. income-generating, etc.)?
SV3d10	Is the space adequate?
SV3e	**Site-planning**
SV3e1	Who was responsible for site-planning?
SV3e2	Were sites prepared adequately to prevent flooding and to allow drainage?

APPENDIX A.4. QUALITATIVE ANALYTICAL TECHNIQUES

A.4.1. Basic analytical structure

A.4.2. Example of analytical summaries for Financing (loan from agency) of houses of households (HHs) 1 and 2

A.4.3. Excerpt of analytical database for summaries for Financing (loan from agency) of houses of households (HHs) 1 and 2

A.4.4. Compilation of summaries of responses to question V1 01a (see Appendix A.6.3.) of households (HHs) which benefited from agency loan

A.4.5. Example of manual analytical method with its colour coding for Implementation of houses in the AG programme

MAIN RESEARCH QUESTION:

What are the results of strategies to address problems in building low-income r housing in Bangladesh if these strategies are examined primarily with respect to views of the main stakeholders in the provision and habitation of housing in term fulfilling their requirements?

Sub-question 3 (V3):

What characteristics of design and physical organisation of rural housing in specific cont best fulfil performance and satisfaction criteria for all stakeholders?

THEMES	QUESTIONS
V3a Site organisation	**V3a1** Do site layouts allow adequate drainage and prevention of flooding?
	V3a2 Do sites provide protection from natura and human hazards?
	V3a3 How do sites relate to their surrounding
	V3a4 Do site layouts provide necesssary privacy?
	V3a5 Are sites accessible?
	V3a6 Do site layouts allow for necessary outdoor activities?
V3b Installation/Construction	**V3b1** Are there any problems faced during construction in specific types of house designs?
	V3b2 What are the advantages and disadvantages in construction with speci building materials?
V3c Climatic fit	**V3c1** What is the performance of houses in heavy rain?
	V3c2 What is the performance of houses in ho weather?
	V3c3 Do houses perform adequately during floods?
	V3c4 Can houses effectively resist storms?
	V3c5 Are orientations of houses climatically suitable?
V3d Cultural fit	**V3d1** Do houses allow for performing religiou rituals adequately?
	V3d2 Can households carry out daily basic activities adequately in the houses/sites?
	V3d3 Can families adequately spend time together in the houses/sites?
	V3d4 Do houses have provision for receiving guests?
	V3d5 Do houses/sites allow for income-generating activities?
V3e Flexibility	**V3e1** Is it possible to modify house design according to the needs of households?
	V3e2 Can houses accommodate changes arisin from changing needs of households over time?

Appendix A.4.1. Basic analytical structure

MAIN RESEARCH QUESTION:

What are the results of strategies to address problems in building low-income rural housing in Bangladesh if these strategies are examined primarily with respect to the views of the main stakeholders in the provision and habitation of housing in terms of fulfilling their requirements?

Sub-question 1 (V1):

How far does the mechanism of providing or acquiring funds for house construction and maintenance by low-income households meet expectations and needs of the stakeholders?

THEMES	QUESTIONS
V1a Affordability	**V1a1** Is the amount of funds or type of house acquired consistent with income?
	V1a2 What is the relationship between personal funds/ time/ labour invested in house construction and household income?
	V1a3 Are maintenance/ reconstruction costs compatible with income?
V1b Disbursement/Acquisition of funds/house	**V1b1** Does delay in disbursement or acquisition of funds/houses affect households?
	V1b2 What are the coping mechanisms of households when there is delay in disbursement or acquisition?
V1c System of financing	**V1c1** What are the advantages and disadvantages of housing loans?
	V1c2 What are the advantages and disadvantages of providing housing as grant?
	V1c3 What are the attitudes towards loans vs. grants?
	V1c4 What is the relationship between system of finance and long term issues such as ownership, obligations and restrictions?
V1d Paperwork	**V1d1** Does distance to be travelled for paperwork by prospective houseowner have a bearing on the quality of housing?
	V1d2 Does literacy level affect the ability of households to secure housing?

MAIN RESEARCH QUESTION:

What are the results of strategies to address problems in building low-income rural housing in Bangladesh if these strategies are examined primarily with respect to the views of the main stakeholders in the provision and habitation of housing in terms of fulfilling their requirements?

Sub-question 2 (V2):

To what extent does the process of implementation of housing of low-income households in rural areas facilitate effective production and management of the housing?

THEMES	QUESTIONS
V2a Beneficiary selection	**V2a1** What is the process of beneficiary selection in a context where houses cannot be provided to all those who need them?
	V2a2 Why do some villagers not opt for housing programmes even though they need a house?
	V2a3 Does the process of beneficiary selection by agencies cause conflict/resentment among villagers and towards agency fieldworkers?
V2b Supply of building materials/ components	**V2a1** What are the advantages and disadvantages of utilising locally available materials vs materials brought in from outside?
	V2a3 How does the system of acquisition of materials/components affect the process of implementation of housing?
V2c Local construction skills	**V2c1** What are the advantages and disadvantages of employing local construction workers vs. workers from outside?
	V2c2 Does the involvement of agencies in house construction enhance the quality of houses?
V2d Houseowner participation	**V2d1** Does consultation of agencies/builders with houseowners prior to construction lead to more effective implementation?
	V2d2 Does participation of households in construction facilitate implementation?
	V2d3 Do households prefer to take part in construction or have houses built by others?
	V2d4 What are the available choices for houseowners in site selection and planning?
V2e Technical supervision	**V2e1** Does technical supervision contribute to the quality of construction?
	V2e2 Does the involvement of external non-technical persons contribute to the quality of construction?
V2f Post-construction monitoring	**V2f1** Does contact with building specialists after completion of construction assist in maintenance of the houses?
	V2f2 Who is responsible for maintenance of houses?

MAIN RESEARCH QUESTION:

What are the results of strategies to address problems in building low-income rural housing in Bangladesh if these strategies are examined primarily with respect to the views of the main stakeholders in the provision and habitation of housing in terms of fulfilling their requirements?

Sub-question 3 (V3):

What characteristics of design and physical organisation of rural housing in specific contexts best fulfil performance and satisfaction criteria for all stakeholders?

THEMES	QUESTIONS
V3a Site organisation	**V3a1** Do site layouts allow adequate drainage and prevention of flooding?
	V3a2 Do sites provide protection from natural and human hazards?
	V3a3 How do sites relate to their surroundings?
	V3a4 Do site layouts provide necesssary privacy?
	V3a5 Are sites accessible?
	V3a6 Do site layouts allow for necessary outdoor activities?
V3b Installation/Construction	**V3b1** Are there any problems faced during construction in specific types of house designs?
	V3b2 What are the advantages and disadvantages in construction with specific building materials?
V3c Climatic fit	**V3c1** What is the performance of houses in heavy rain?
	V3c2 What is the performance of houses in hot weather?
	V3c3 Do houses perform adequately during floods?
	V3c4 Can houses effectively resist storms?
	V3c5 Are orientations of houses climatically suitable?
V3d Cultural fit	**V3d1** Do houses allow for performing religious rituals adequately?
	V3d2 Can households carry out daily basic activities adequately in the houses/sites?
	V3d3 Can families adequately spend time together in the houses/sites?
	V3d4 Do houses have provision for receiving guests?
	V3d5 Do houses/sites allow for income-generating activities?
V3e Flexibility	**V3e1** Is it possible to modify house design according to the needs of households?
	V3e2 Can houses accommodate changes arising from changing needs of households over time?

Appendix A.4.2. Example of analytical summaries for Financing (loan from agency) of houses of households (HHs) 1 and 2

01 LOAN
01a Loan from agency
HH No. 1

- **Profile**

NAME OF PROGRAMME	LOCATION	NAME OF RESPONDENT	SEX	AGE
Grameen Bank (GB)	Dinajpur	Tushar Bala	Female	30
	RELIGION	NO. OF HOUSEHOLD MEMBERS	YEAR OF CONSTN.	AVERAGE HOUSEHOLD INCOME (Tk/month)
	Hindu	7	1992	5,000

- **V1a Affordability**

V1a1 Is the amount of funds or type of house acquired consistent with income?
Took Tk. 12,000 loan. Weekly repayment scheme. Steady income from 4 male working members of household, no problem in repayment. Moderately high loan (***Note GB loan sizes), consistent with moderately high household income. Has managed to repay in 3 years.

V1a2 What is the relationship between personal funds/time/labour invested in house construction and household income?
Invested Tk. 6,000-7,000 personal funds. This is the lumpsum amount family could spend on house. Extra margin of funds utilised for loan repayment in instalments. As household has a steady income they have been able to take advantage of a housing loan to acquire additional funds to supplement their personal savings invested in house construction.

V1a3 Are maintenance/reconstruction costs compatible with income?
Household has sufficient extra funds for regular maintenance. They have built other structures with own funds on the homestead, though more modest than main house. Also, as observed in three field visits over a period of 6 months, a variety of additions and extentions were being built, which is again an indication of the household steady income and capacity to save from income for construction.
Respondent expressed resentment that GB does not provide any form of insurance against damage in natural disasters. However, she has the financial security to take out another loan for repair/reconstruction if necessary, although she is not altogether cheerful (understandably) about that, especially that she would have to repay the loan with interest.

- **V1b Disbursement/Acquisition of funds/house**

V1b1 Does delay in disbursement or acquisition of funds/house affect household?
Because of specific GB group procedure, each loan has to be endorsed by 35 members of centre, in order to facilitate peer pressure and guarantee against default. This delays the processing of loan applications; signatures of all members have to be obtained. Also, there is quite a bit of paperwork involved. In this HH, cash money was made available in two instalments of Tk. 6,000 each, as the total loan was too large to be disbursed at the same time. Hence, the procedure was repeated and thereby augmenting the delay.

V1b2 What are the coping mechanisms of households when there is delay in disbursement/acquisition?
In this HH, delay was more of an annoyance than a setback as household had a house to live in. This was a smaller and more modest house than the present one, hence the loan was essentially to build a larger and better house as opposed to building a shelter.

- **V1c System of financing**

V1c1 What are the advantages and disadvantages of housing loans?
As household has a steady income it was advantageous to get a housing loan. It allowed them to build a satisfactory house by being able to access sufficient funds, which they would not have been able to arrange on their own. With savings from steady income, they are able to gradually repay the loan by regular instalments.

V1c2 What are the advantages and disadvantages of providing housing as grants?
Not applicable.

V1c3 What are the attitudes towards loans vs. grants?
Not available.

V1c4 What is the relationship between system of finance and long term issues such as ownership, obligations and restrictions?
Had to transfer land title to female head of household in order to fulfil loan criteria. Cannot sell house before repaying loan, but can do so after repayment. Flexible approach, but also indicative that GB is essentially interested in maintaining a good repayment portfolio over the long term welfare of beneficiaries. In this HH, beneficiary is voluntarily interested in maintaining a long term link with GB as it is a good source of obtaining loans when necessary.

V1d Paperwork

V1d1 Does distance to be travelled for paperwork by prospective houseowner have a bearing on the quality of housing?
Did not have to travel far.

V1d2 Does literacy level affect the ability of households to secure housing?
Had others who helped, as beneficiary is not literate. More educated relatives/friends accompanied her during preparation of deed for land.

01 LOAN
01a Loan from agency
HH No. 2
(add vignette about offering tea)

- **Profile**

NAME OF PROGRAMME	LOCATION	NAME OF RESPONDENT	SEX	AGE
Grameen Bank (GB)	Dinajpur	Proshad Chandra Ray	Male	40
	RELIGION	NO. OF HOUSEHOLD MEMBERS	YEAR OF CONSTN.	AVERAGE HOUSEHOLD INCOME (Tk/month)
	Hindu	5	1992	800 (Very low income/ unsteady work)

- **V1a Affordability**

V1a1 Is the amount of funds or type of house acquired consistent with income?
Took Tk. 11,500 loan. Weekly repayment scheme. Very low and unsteady income, he works as occasional day labourer and on odd jobs, which his wife also does sometimes. Children are too small to work. High amount of loan money as compared to income, has serious problems in repaying. However, house appears smaller and less substantial than HH 1 who took a similar amount of loan. It may well be that he spent part of the loan money on household expenses, to supplement his low income. This is possibly due to the fact that he was sick when he received the first loan disbursement, and thus may have used some of the money for medicines. Still Tk. 1,500 repayment remaining. Has managed to repay Tk. 2000/year on average.

V1a2 What is the relationship between personal funds/time/labour invested in house construction and household income?
Invested around Tk. 3,000 personal funds. This is almost half of what HH 1 invested, which is somewhat strange given the much lower income and the much poorer condition of the house. Maybe, as the house uses bamboo walls and posts and not wattle-and-daub type construction as in HH 1, recurrent maintenance expenditure could be higher. Also, figures quoted by villagers are not always necessarily accurate.

V1a3 Are maintenance/reconstruction costs compatible with income?
From the condition of the house it is clear that household does not have enough funds for maintenance. The bamboo walls are in very poor condition. In HH there is damage by natural disasters, the household would face a very serious crisis. They would not be able to obtain any more loans from GB as they have been irregular in repayment of present loan.

- **V1b Disbursement/Acquisition of funds/house**

V1b1 Does delay in disbursement or acquisition of funds/house affect household?
Similar procedure as in HH 1. Disbursed loan in 3 instalments, separately for components and labour. He feels particularly harassed by the staggered loan disbursement process: "I went to the GB office several times and they made me come back again and again without dealing with my application. I felt that I was going around in circles. As I am a day labourer, I lost my income on those days when I went to the office."

V1b2 What are the coping mechanisms of households when there is delay in disbursement/acquisition?
Household had former house, so had a place to live while loan was being processed. This was a smaller and more modest house than the present one, hence the loan was essentially to build a larger and better house as opposed to building a shelter.This wasn't the problem, rather it was the harassment faced while securing the loan.

- **V1c System of financing**

V1c1 What are the advantages and disadvantages of housing loans?
As household has an unsteady income they fell into problems repaying the loan. He had some land, which allowed him initially repay part of the loan with income made from rice grown on the land, but over time he had to sell all his land to keep up with his repayment. He then took loans from moneylenders at high interest rates to repay the GB loan, which led him into greater crisis. His relationship with local GB officials worsened, and now different officials quote different figures of money that he has to repay. After his old account book got filled up, they took it away and did not give him a new one, so now he is confused about how much he exactly owes GB. GB officials now suggest that he sells off the CI sheet roof to repay his loan. About this, his wife Kanta says, "It doesn't make any sense, first they provide us with a loan to build a house, now they say that we should sell the house to pay back the loan". It was his idea to take a housing loan and his wife had never agreed. Now he regrets his decision.
This is a clear example that housing loans are advantageous only to those who have a steady income to make regular repayments. In the absence of that it can lead a household to serious crisis. Loans offer the possibility of securing funds quite easily, especially GB loans with lower interest rates than local moneylenders. Villagers get attracted to that prospect, but if they face disruption in income, employment or setbacks such as poor agricultural production or natural disasters they can become entrenched in severe problems.

V1c2 What are the advantages and disadvantages of providing housing as grants?
Not applicable.

V1c3 What are the attitudes towards loans vs. grants?
Not available. Though one may speculate that with the experience this household had with loans, given the scope they would obviously prefer housing as grant.

V1c4 What is the relationship between system of finance and long term issues such as ownership, obligations and restrictions?
Same as HH 1. Only difference is that with the relationship with GB being severed, there is very little possibility of any long term link, hence little possibility of future access to credit from GB.

V1d Paperwork

V1d1 Does distance to be travelled for paperwork by prospective houseowner have a bearing on the quality of housing?
Did not have to travel far.

V1d2 Does literacy level affect the ability of households to secure housing?
Relied on officials to interpret paperwork. "Just signed where they told me to".

Appendix A.4.3. Excerpt of analytical database for summaries for Financing (loan from agency) of houses of households (HHs) 1 and 2

HH No	Note	Category	Type	Sub Type	a1	a2	a3	b1	b2	c1	c2
1		V1	01	a	Took Tk. 12,000 loan. Weekly repayment scheme. Steady income from 4 male working members of household, no problem in repayment. Moderately high loan (***Note GB loan sizes), consistent with moderately high household income. Has managed to repay in 3 years.	Invested Tk. 6,000-7,000 personal funds. This is the lumpsum amount family could spend on house. Extra margin of funds utilised for loan repayment in instalments. As household has a steady income they have been able to take advantage of a housing loan to acquire additional funds to supplement their personal savings invested in house construction.	Household has sufficient extra funds for regular maintenance. They have built other structures with own funds on the homestead, though more modest than main house. Also, as observed in three field visits over a period of 6 months, a variety of additions and extentions were being built, which is again an indication of the household steady income and capacity to save from income for construction. Respondent expressed	Because of specific GB group procedure, each loan has to be endorsed by 35 members of centre, in order to facilitate peer pressure and guarantee against default. This delays the processing of loan applications; signatures of all members have to be obtained. Also, there is quite a bit of paperwork involved. In this HH, cash money was made available in two instalments of Tk. 6,000 each, as the total loan was too large to be disbursed at the same time. Hence, the procedure was repeated and	In this HH, delay was more of an annoyance than a setback as household had a house to live in. This was a smaller and more modest house than the present one, hence the loan was essentially to build a larger and better house as opposed to building a shelter.	As household has a steady income it was advantageous to get a housing loan. It allowed them to build a satisfactory house by being able to access sufficient funds, which they would not have been able to arrange on their own. With savings from steady income, they are able to gradually repay the loan by regular instalments.	Not applicable.

HH No	Note	Category	Type	Sub Type	a1	a2	a3	b1	b2	c1	c2
							resentment that GB does not provide any form of insurance against damage in natural disasters. However, she has the financial security to take out another loan for repair/reconstruction if necessary, although she is not altogether cheerful (understandably) about that, especially that she would have to repay the loan with interest.	thereby augmenting the delay.			
2		V1	01	a	Took Tk. 11,500 loan. Weekly repayment scheme. Very low and unsteady income, he	Invested around Tk. 3,000 personal funds. This is almost half of what HH 1 invested, which is somewhat	From the condition of the house it is clear that household does not have enough funds for maintenance. The bamboo	Similar procedure as in HH 1. Disbursed loan in 3 instalments, separately for components and labour. He feels particularly	Household had former house, so had a place to live while loan was being processed. This was a smaller and more modest	As household has an unsteady income they fell into problems repaying the loan. He had some land, which allowed him	Not applicable.

HH No	Note	Category	Type	Sub Type	a1	a2	a3	b1	b2	c1	c2
					works as occasional day labourer and on odd jobs, which his wife also does sometimes. Children are too small to work. High amount of loan money as compared to income, has serious problems in repaying. However, house appears smaller and less substantial than HH 1 who took a similar amount of loan. It may well be that he spent part of the loan money on household expenses, to supplement his low income. This is possibly due to the fact that he was sick	strange given the much lower income and the much poorer condition of the house. Maybe, as the house uses bamboo walls and posts and not wattle-and daub type construction as in HH 1, recurrent maintenance expenditure could be higher. Also, figures quoted by villagers are not always necessarily accurate.	walls are in very poor condition. In HH there is damage by natural disasters, the household would face a very serious crisis. They would not be able to obtain any more loans from GB as they have been irregular in repayment of present loan.	harassed by the staggered loan disbursement process: "I went to the GB office several times and they made me come back again and again without dealing with my application. I felt that I was going around in circles. As I am a day labourer, I lost my income on those days when I went to the office."	house than the present one, hence the loan was essentially to build a larger and better house as opposed to building a shelter.This wasn't the problem, rather it was the harassment faced while securing the loan.	initially repay part of the loan with income made from rice grown on the land, but over time he had to sell all his land to keep up with his repayment. He then took loans from moneylenders at high interest rates to repay the GB loan, which led him into greater crisis. His relationship with local GB officials worsened, and now different officials quote different figures of money that he has to repay. After his old account book got filled up, they took it away and did not give him a new one, so	

HH No	Note	Category	Type	Sub Type	a1	a2	a3	b1	b2	c1	c2
					when he received the first loan disbursement, and thus may have used some of the money for medicines. Still Tk. 1,500 repayment remaining. Has managed to repay Tk. 2000/year on average.					now he is confused about how much he exactly owes GB. GB officials now suggest that he sells off the CI sheet roof to repay his loan. About this, his wife Kanta says, "It doesn't make any sense, first they provide us with a loan to build a house, now they say that we should sell the house to pay back the loan". It was his idea to take a housing loan and his wife had never agreed. Now he regrets his decision. This is a clear example that housing loans are advantageous only to those who have a steady income to make regular repayments. In the absence of	steady income to make regular repayments. In the absence of that it can lead a household to serious crisis. Loans offer the possibility of securing funds quite easily, especially GB loans with lower interest rates than local moneylenders. Villagers get attracted to that prospect, but if they face disruption in income, employment or setbacks such as poor agricultural production or natural disasters they can become entrenched in severe problems. Not applicable.

HH No	Note	Cate gory	Type	Sub Type	a1	a2	a3	b1	b2	c1	c2
										steady income to make regular repayments. In the absence of that it can lead a household to serious crisis. Loans offer the possibility of securing funds quite easily, especially GB loans with lower interest rates than local moneylenders. Villagers get attracted to that prospect, but if they face disruption in income, employment or setbacks such as poor agricultural production or natural disasters they can become entrenched in severe problems.	

Appendix A.4.4. Compilation of summaries of responses to question V1 01a (see Appendix A.4.3.) of households (HHs) which benefited from agency loan

V1a1 (for Type 01)

1
V1 01 a
Took Tk. 12,000 loan. Weekly repayment scheme. Steady income from 4 male working members of household, no problem in repayment. Moderately high loan (***Note GB loan sizes), consistent with moderately high household income. Has managed to repay in 3 years.

2
V1 01 a
Took Tk. 11,500 loan. Weekly repayment scheme. Very low and unsteady income, he works as occasional day labourer and on odd jobs, which his wife also does sometimes. Children are too small to work. High amount of loan money as compared to income, has serious problems in repaying. However, house appears smaller and less substantial than HH 1 who took a similar amount of loan. It may well be that he spent part of the loan money on household expenses, to supplement his low income. This is possibly due to the fact that he was sick when he received the first loan disbursement, and thus may have used some of the money for medicines. Still Tk. 1,500 repayment remaining. Has managed to repay Tk. 2000/year on average.

3
V1 01 a
Took Tk. 8,000 loan. Weekly repayment scheme. Husband was alive and had a steady income as a rice merchant, though not very high. Repaid loan 2 years ago, and husband died a year after that. Did not take a large loan; consistent with income and type of house construction (e.g. no R.C. posts, mud walls).

8
V1 01 a
Took Tk. 20,000 loan. Tk. 8,000 for land + Tk. 12,000 for house. Weekly repayment scheme. Part of cluster village rehabilitation programme for GB members who lost land in riverbank erosion, hence provided loan for land. Cost of materials and incomes higher than in area of HH 1, 2, 3, as close to Dhaka. Hence Tk. 12,000 cannot be considered as a large loan. Bamboo walls cheaper than materials such as CI sheet. Although household income is not very high, it is steady (husband is carpenter and main breadwinner). Therefore they have been able to keep up with loan repayment. 2/3 of loan repaid. Loan size consistent with income.

9
V1 01 a
Same as HH 8, part of same cluster village rehabilitation programme, same loan size. Household income quite high as compared to HH 8, and generally steady as owns timber and press business. Also higher income indicated by previous ownership of large amount of land now lost due to riverbank erosion. Hence Tk. 12,000 for house cannot be considered as a large loan, but relates to GB maximum loan of Tk. 20,000 (in 1993, now Tk. 25,000). As land cost was included in the loan, had less amount than desired for house construction. Has managed to repay most of the loan more or less regularly, from monthly savings of around Tk. 2,000.

13
V1 01 a
Claims that house costs Tk. 8,000-10,000, but JBP is charging Tk. 18,000 to be repaid in Tk. 150 monthly instalments over 10 years. (He is possibly not considering administrative costs and projected inflation over the 10 year repayment period, which has led to a repayment figure higher than the cost of construction. However, this might not be a wise policy in houses of bamboo walls which deteriorate within 5 years; obviously one would be reluctant to keep paying for something which has partly worn down) Has managed to repay 2/3 of the loan, but now facing problems in repaying the rest. This is a bit doubtful, as he has managed to repay at a higher rate so far; could be that as other beneficiaries have stopped repaying, he has also become reluctant to repay. He claimed to have repaid most of the loan from his own income. However, his wife claims that his family has lost land in riverbank erosion and his income as a small businessman is not very high, so her family has been supporting them to a large extent recently, which can be considered shameful in cultural terms. This was told to the interview team by the wife in confidence in the absence of the husband. In any HH, if the loan had been charged at the correct construction cost, maybe then the household would have been able to pay. Because they believe that they are being charged more the question may have arisen if the cost is inconsistent with their income.
JBP beneficiaries were promised Tk. 3,000 for income generation to repay the loan, but this was not

followed through. If it had been, it might have made a difference. As it now stands, this has become a source of further resentment against JBP.

14

V1 01 a

Claims that house costs Tk. 10,000-12,000 at the most, but JBP is charging Tk. 18,000 to be repaid in Tk. 150 monthly instalments over 10 years. (Similar to HH 13) Has only paid Tk. 900 at the beginning but then stopped paying altogether. He has a very low income from unstable employment on menial jobs on a daily basis (day labourer) and recently their cow worth Tk. 5,000 died, depriving them of the income they had from its milk. His wife works occasionally at a nearby rice mill. It is clear from the state of the house and their living conditions that it is beyond their means to make regular loan repayments. The household, specifically Kajol Mia, has a very bad relationship with JBP staff now. He faces constant pressure and threats from them, and he is unable to repay the loans, leading to a very difficult situation.

The fact that JBP offered Tk. 3,000 income generation loan initially and did not follow through has caused great resentment. For Kajol Mia, "This promise is what attracted me to the JBP programme". He further said that JBP staff told him that if foreign visitors come [possibly UNDP officials] then to tell them that he had received the Tk. 3,000. The visitors eventually did not come so he did not have to lie. This could be an indication of corruption by JBP; the Tk. 3,000 which was supposed to be provided to beneficiaries, but was not, may have been shown in their accounts to LGED/UNDP while it may have actually been taken by JBP staff.

18

V1 01 a

Took a small loan of Tk. 7,500 at Tk. 123 monthly repayment instalments (Tk. 120 to Proshika + Tk. 3 for fieldworkers' transport to submit repayment to office). Has managed to repay most of the loan, only 3-4 instalments left. He is willing to complete repayment, but there have not been meetings for 3-4 months. Earns a good income as a mason, although works seasonally. Also, some remittance money from son-in-law in Saudi Arabia. Household seems to have relatively good living conditions, reflected by ownership of T.V., ceiling fan, steel almirah, etc., although does not own agricultural land and plot size quite small. Hence did not face any problems in meeting repayment for such a small loan. In fact, the loan was not at all adequate for what the household desired; according to Lokman Mia: "What can be made with Tk. 7,500? Not even a CI roof bamboo house!"

26

V1 01 a

Small pucca house provided at subsidised credit. Tk. 19,500 (including Tk. 4,000 for latrine) to be repaid in Tk. 235 monthly instalments in 7 years. House does not belong to respondent. Their son and son-in-law, who both work as drivers in the LGED office, were provided a house each on the same compound. They both now live elsewhere, and thus the parents live in their son's house and the other house belonging to the son-in-law has been rented out. Son responsible for repaying the loan. As he works in the LGED office, monthly deductions as loan repayment are taken out from his salary. Enamul and his family living in the house do not have an income as they are aged, they depend on their son and son-in-law. A separate interview was conducted with son-in-law, Bashir. According to him, Tk. 19,500 is a justifiable cost, which indicates that the house is affordable for him. As he has a steady government job and salary, it is within his means to repay the loan at the subsidised cost of house. Quite consistent with income at a lower-middle class level, indicated by possesions such as T.V., wall clock, etc. As quite aptly stated by an LGED field co-ordinator: "This type of house is for lower middle-class families, not for those with low income".

27

V1 01 a

House (not pucca type) provided on credit. Tk. 19,500 (including Tk. 4,000 for latrine) to be repaid in Tk. 262 monthly instalments in 7 years. Had difficulty repaying at the beginning as beneficiary was unemployed, but now has a steady job as nightguard, and can meet repayment. In fact, the household recently built a much larger CI sheet house next to the ETDA/LGED house (incrementally in a short span of time), which is an indication of his income, from which he can make savings. Thus, the provided house was not initially consistent with income, and now with expanded income it is also not consistent as the household can afford a bigger and more durable house.

Beneficiary was promised Tk. 20,000 loan for income generation but this was not followed through. This would have been quite useful for him, if he had not been fortunate enough to find a job.

39

V1 01 a

Semi-pucca type house provided on credit as part of rehabilitation programme after 1991 cyclone. Household was told that houses would be provided as grants, but after they occupied house they were told that they would have to repay Tk. 55,000 as cost of house. Initially they paid Tk. 400-500, but then as house began to deteriorate rapidly they stopped repaying. Now they have an unpleasant relationship with LGED;

every 7-8 months LGED staff visit them and demand payment, and they refuse and have quarrels.
Semi-pucca house and the price being charged is inconsistent with income of the household. Their former house (destroyed in the cyclone) cost around Tk. 20,000-30,000 in 1974, but this was built incrementally depending on the availability of funds. Therefore, it may have been possible for them to repay the cost of present house in gradual instalments, but as the household is dissatisfied with the small size of the house and the poor quality of construction, they find it unfair to pay such a high price for this house from their low income.

• CONTRACTOR-BUILT → THEMES/TOPICS
(COMPLETELY)

- → Corruption ✓
- → Promises
- → Participation
- → Replication ✓
- → Quality of constn → (relate to post constn.)
- → Technical supervision. ✓
- → Selection process ✓
- → Post-constn. issues
- → Constn. process (do diagram). ✓
- → Vignettes, boxes.
- → NGO-Govt. issues ✓
- → Location (related to participation)
- → Other extra

• CONTRACTOR-BUILT

→ Promises → AG, LGED/ETDA.

→ Corruption → suspicion

→ Lack of knowledge about selection, constn. (Cases 34, 35, 37).

→ Case 35, also greatly self-built → special case.

→ Good follow-up in the case of WV as project office on site.

→ Case 37, strangers in the area → conflict w/ local residents?

→ in AG supply of CI sheet from govt. owned Ctg. steel mills.

→ AG staff says been involved sometimes, but not evident from cases.

→ Govt. involved in all contractor-built programmes — AG, AG/WVB, ETDA/LGED.

→ Quality of constn. (e.g. Case 35).

→ Seems to work if follow-up NGO is also the implementor, e.g. WVB. Otherwise problems, e.g. AG (mistrust).

• CONTRACTOR-BUILT → SEQUENCE

1. Govt involved in all contractor-built projects
2. Non-govt collaboration — 1.
3. Selection
4. ~~Participation~~ Constn. process
5. Technical supervision — 2.
6. Participation (also Location) → relate to participation
7. Promises
8. Corruption } bear, report, follow from participation issues — 3.
~~9. Replication~~
~~10.~~
9. Quality of Constn.
10. Replication
11. Post-project issues → follow-up by implementing agency works, e.g. WVB — 4.
12. Vignette where appropriate.

→ add ~~vign~~ box with newspaper report on cluster village in Natore.

→ vignette of the exhibit house in NG, ~~Pa~~ Pakurhat.

CASE II

→ Bamboo bought at high prices, too much corruption, contractor stole money → "[illegible]".
- Publicly announced by mike
- Some people had to bribe ADC office.
- Subodh had to pursue 5-6 times.
- 5,000 applied, 150 selected.
  → decided by Chiron Parishad members.
- Resentment by rejected ~~ones~~ applicants.
- CI, timber, cement and rods from Dimj.
  ~~Bitta~~ Bamboo locally → corruption.
- CI and RCC pats good quality, but timber ~~being~~ eaten up by white ants, bena, bamboo pats getting rotten.
- Embankment road was there, so could transport by truck; now breached.
- R.C.C. pats can be made locally, if materials available.
- Was promised a different semi-pucca type house with 5 ft. high brick walls and cement plinth.
- No consultation on design → moved in afterwards.
- No participation in construction → "[illegible]".
- "Maybe agency scared that if give money for construction, people could waste/spend it".
- Choice of site: far from village centres.

(1.)

- although engg. was there, couldn't prevent corruption
- "ସରୁ ସରୁ ମୋଟା ସରୁ ହୁଏ" → after completion of constn → used to come initially, but not anymore.
→ complained about 3 months ago to visiting official (bera nothing, etc) noted it down, but no response yet.
- Vignette → about Chairman breaking RCC post (tape) (poor constn.)
- Promises, e.g. electricity, plow, cattle, etc., but did not fulfil. (see notes).
- Constn. workers from outside (Durg), not give to locals even though could do the work. Contracts had com. term → scope for corruption.
- R.C.C. posts and sanitary slabs/rings fabricated on site after bringing material by truck → do Durg
→ poor quality of sanitary, nobody uses, crumble, RCC posts ok.
- No support system for renewal of bera, bamboo posts, etc.
- 6 months for 150 houses.

(2.)

ACA Staff interview

- NGO officers in some credit programmes stole money.
  → mistrust of NGOs by govt. staff.
- Openly declared in market place etc. to invite application
  → also selected beneficiaries announced.
- Seems to think selection is not a problem.
- Usually too many applicant for the number of houses provided.
- RCC poles locally made
  → bera / bamboo acquired locally.
  → CI sheet from Ctg. steel mills (govt. owned) → transported to local nearby towns, then to site.
  → possibly to control quality and price and reliability of supply.
  Sometimes piles of cement, rod fluctuate.
- Says ben. told about house beig. during selection → contrast with ben. reports
- If meeting before house is provided → is that enough consultation? Seems yes
- Sometimes ben. works as day labourer and gets paid. → but not in case studied → hope for earning money
- Staff in favour of involving ben. in construction for ben. → is it only lip service?
- Site selection by AC head office → ben. not involved → can have problems as in Case 11.

(1.)

+ Technical support by engg., local project implementation officer.

- Various level of admin →

too much bureaucracy?

Dhaka H.O.
↓
Thana Admin officer (TNO) → TNO chairman
↓
Project implementation officer
↓
District admin. engg.
↓
thana (local) engg.

- Says agency staff visit frequently after const. → contrast with ben. report.
→ has to be remembered that staff spoke about AG projects in general, cases studied are specific and may thus vary a bit...

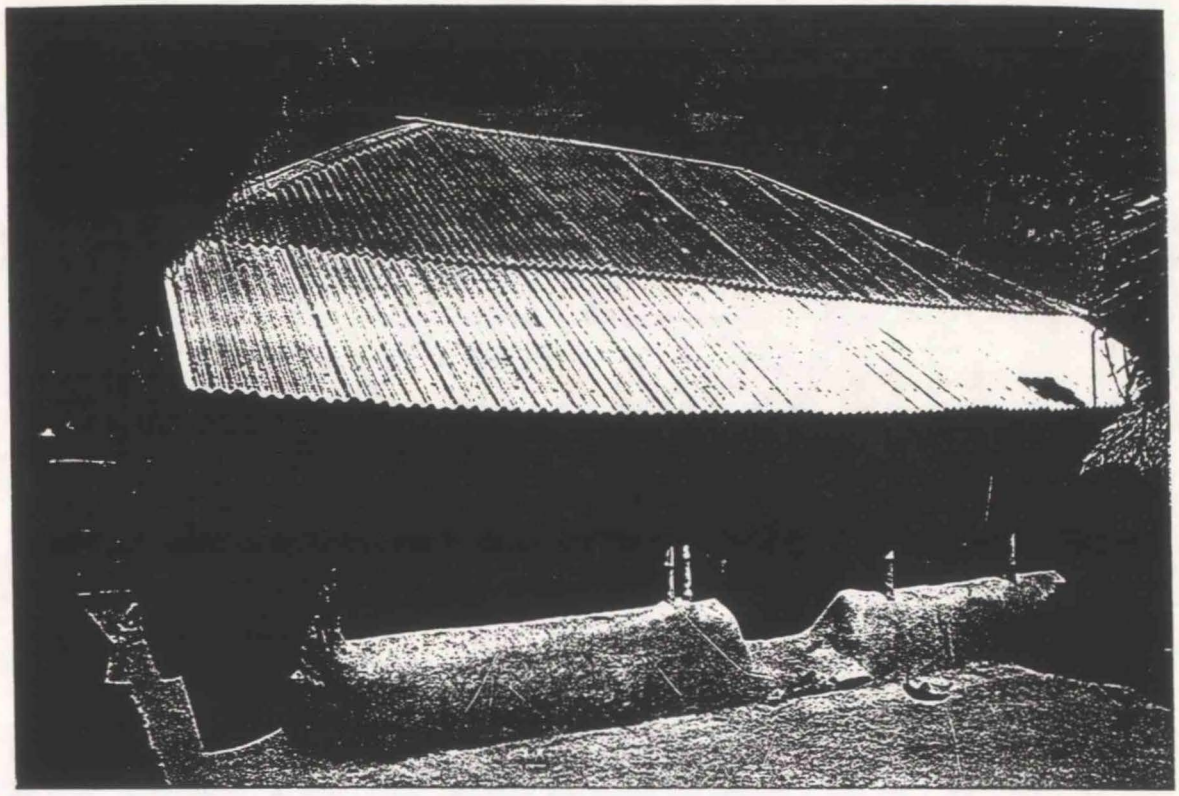
- Admits that bera get spoilt, no programme for maintenance, but maybe in future.

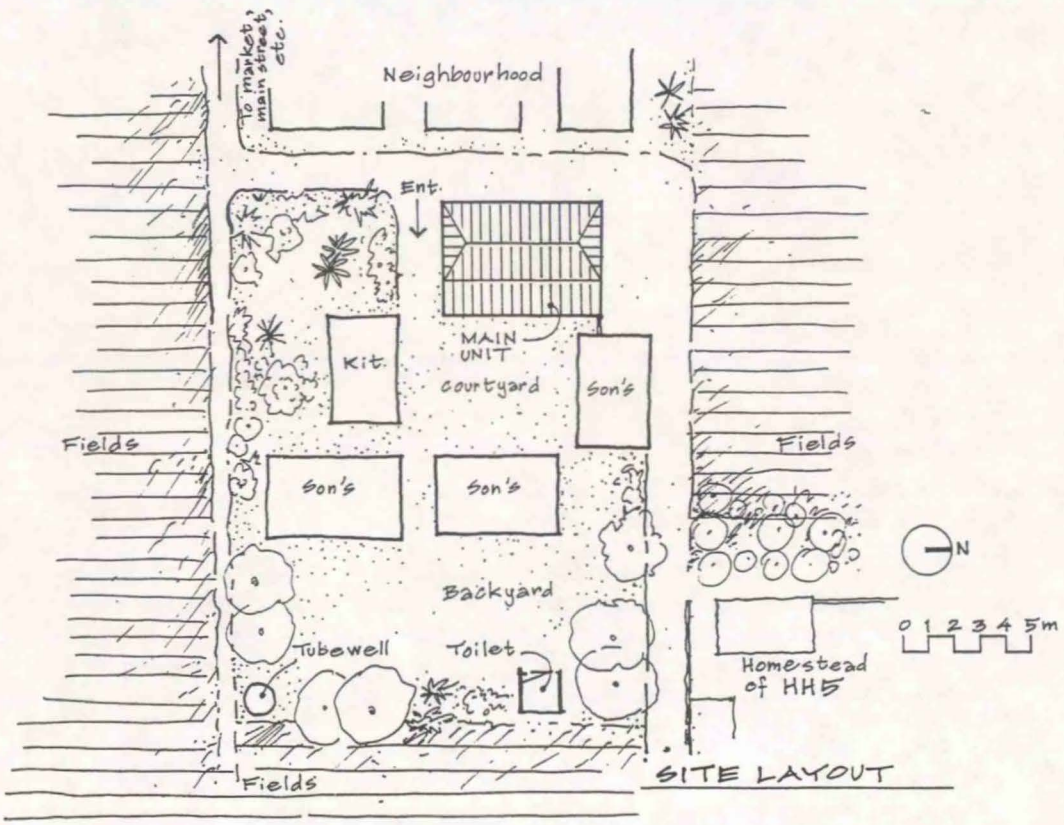
- Says const. workers are local → Contrast with ben. report.

- Takes 6-7 days for const. after fabricating RCC posts (21 days for curing).

(2.)

APPENDIX A.5. MEASURED DRAWINGS AND DOCUMENTATION OF HOUSES OF THE HOUSEHOLD (HH) SAMPLE





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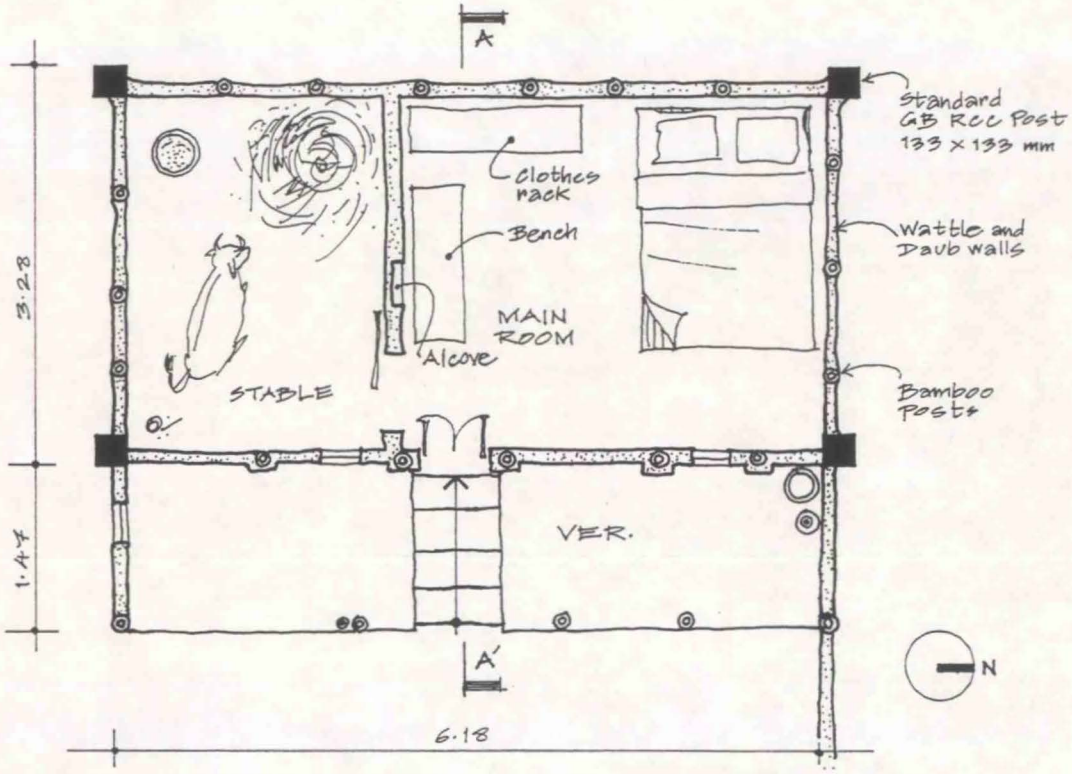

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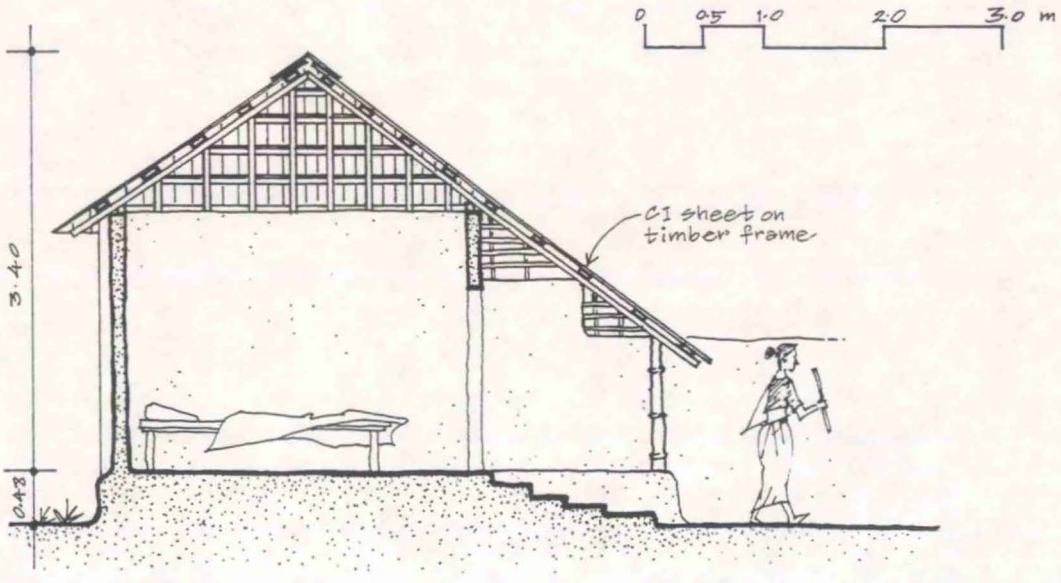

SECTION AA'

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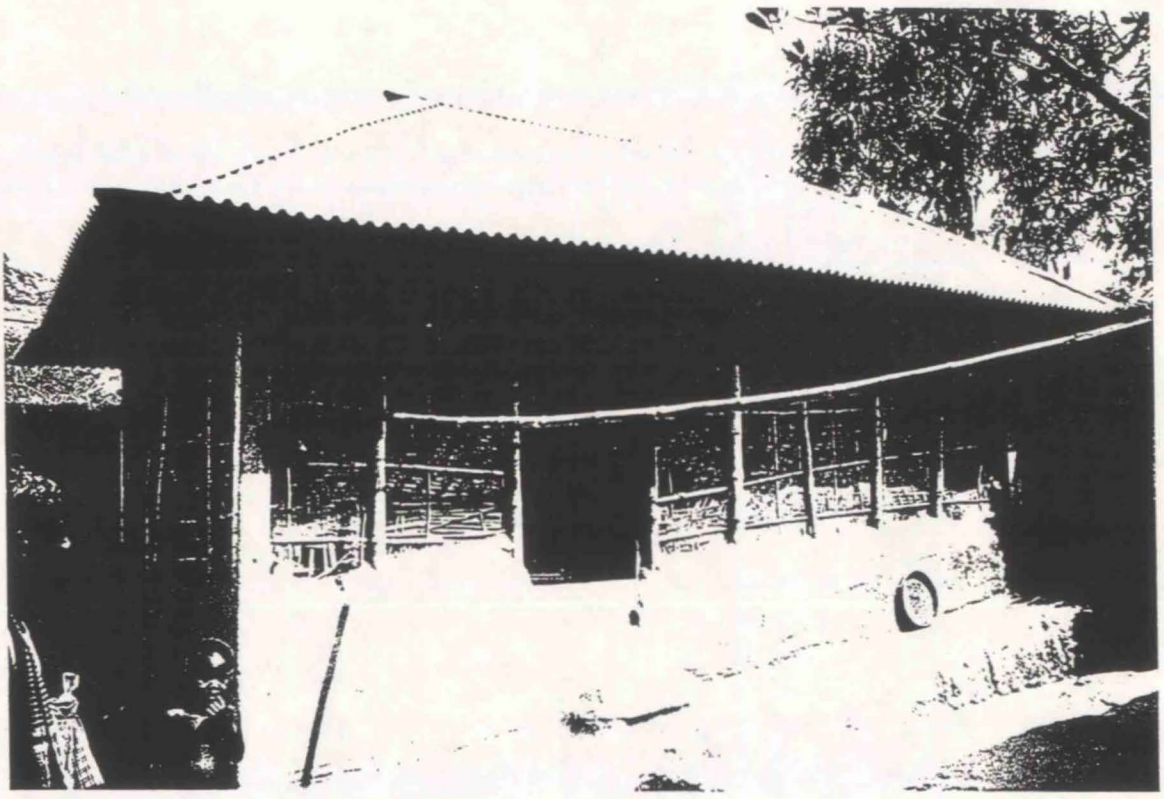

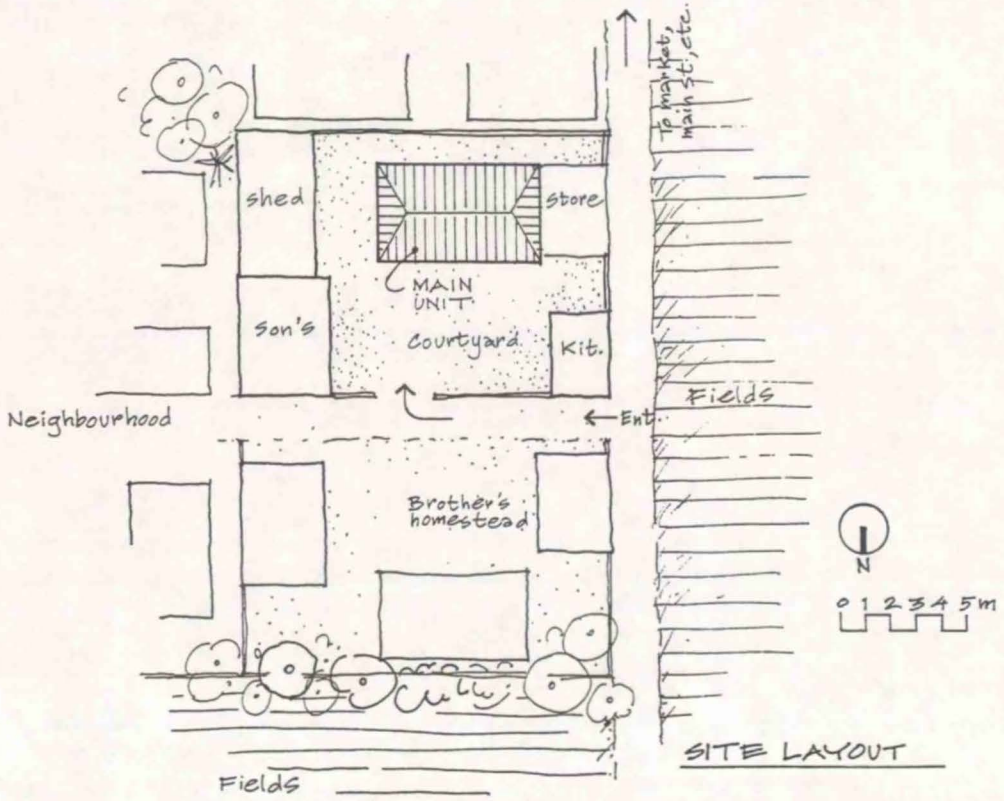

SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
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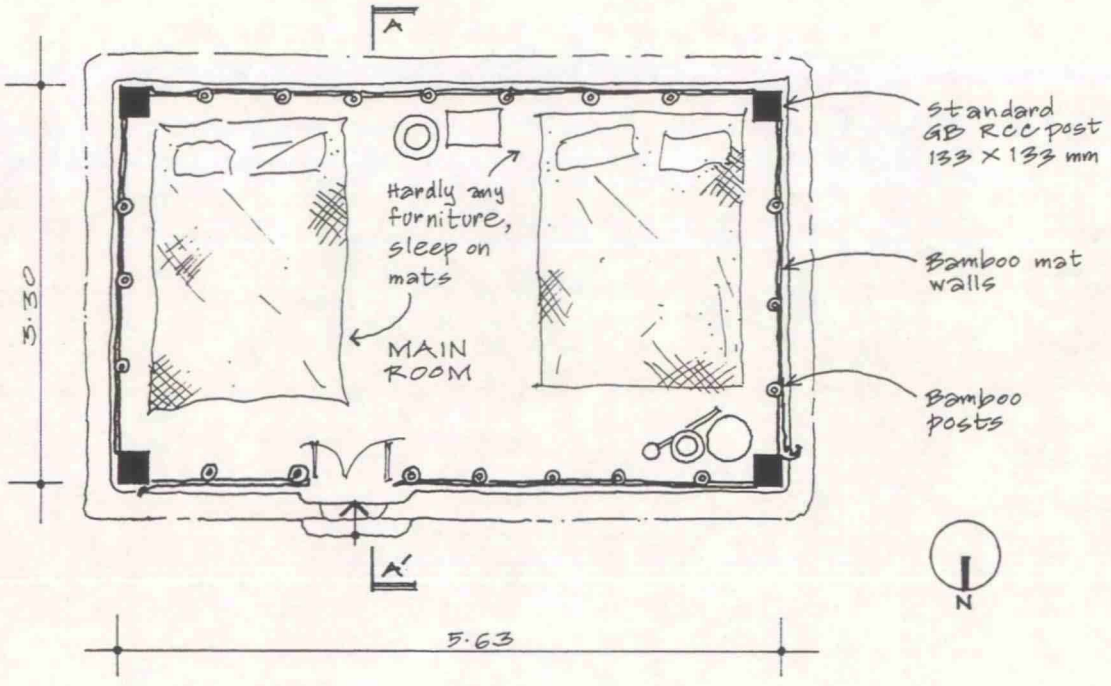
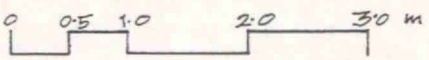
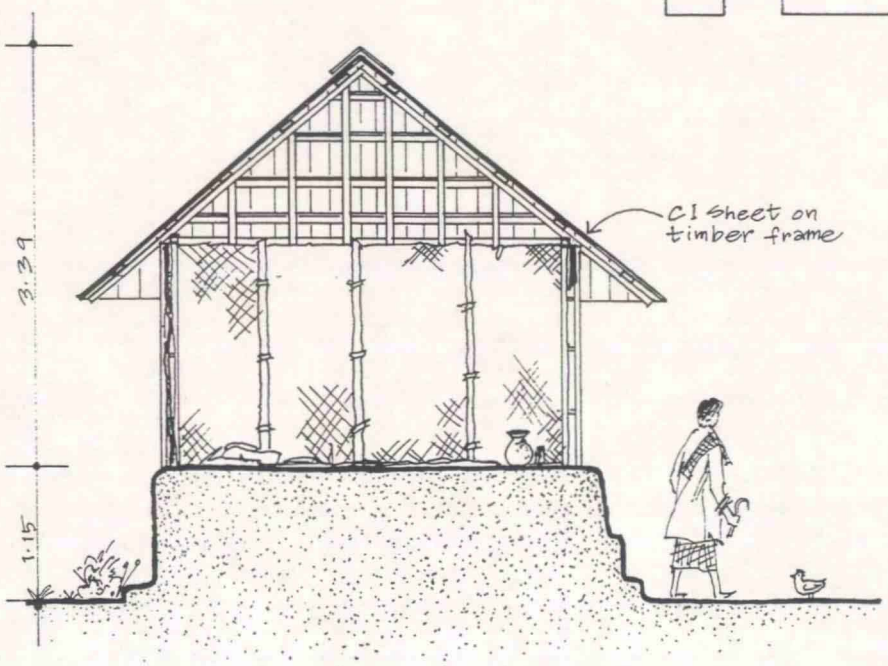


PLAN





SECTION AA'

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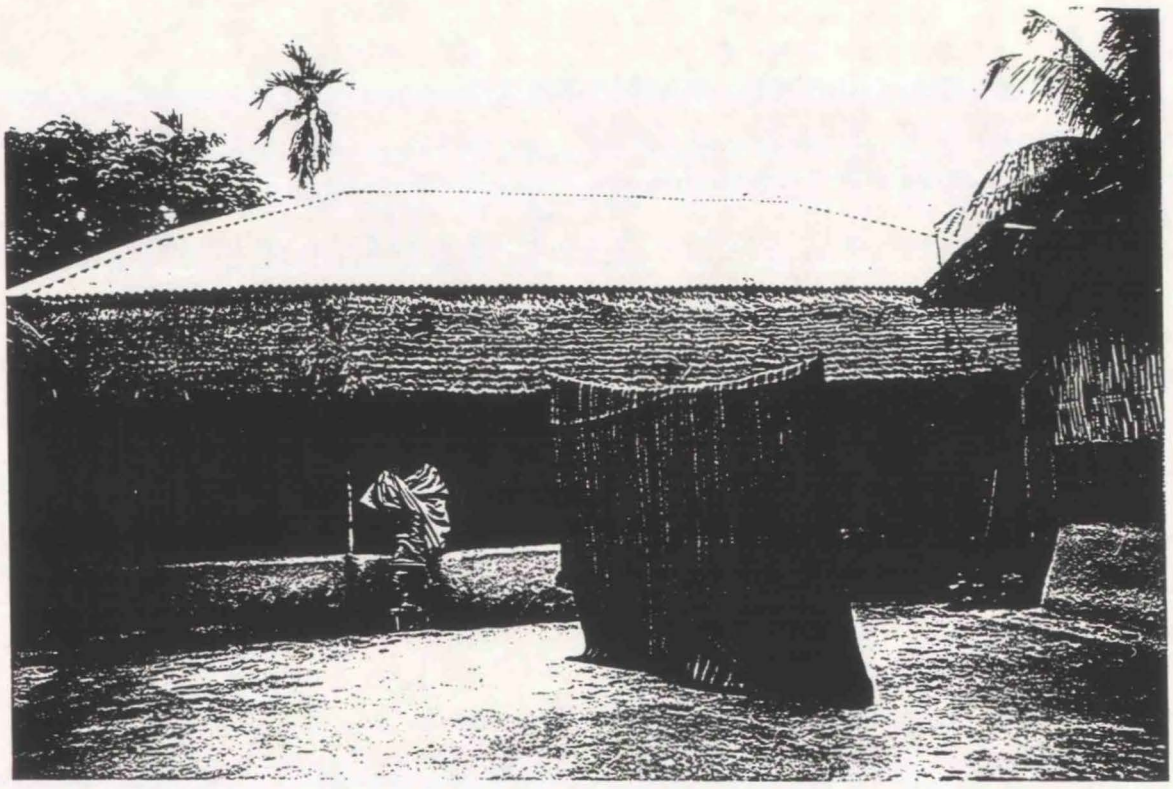

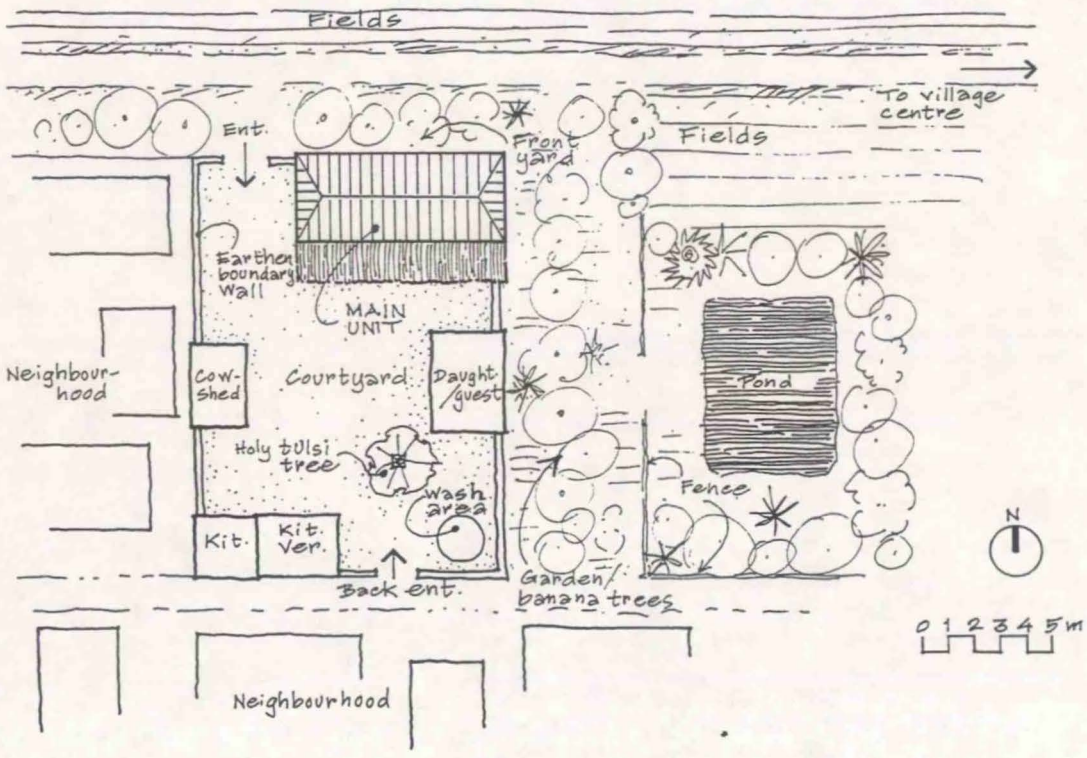

SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
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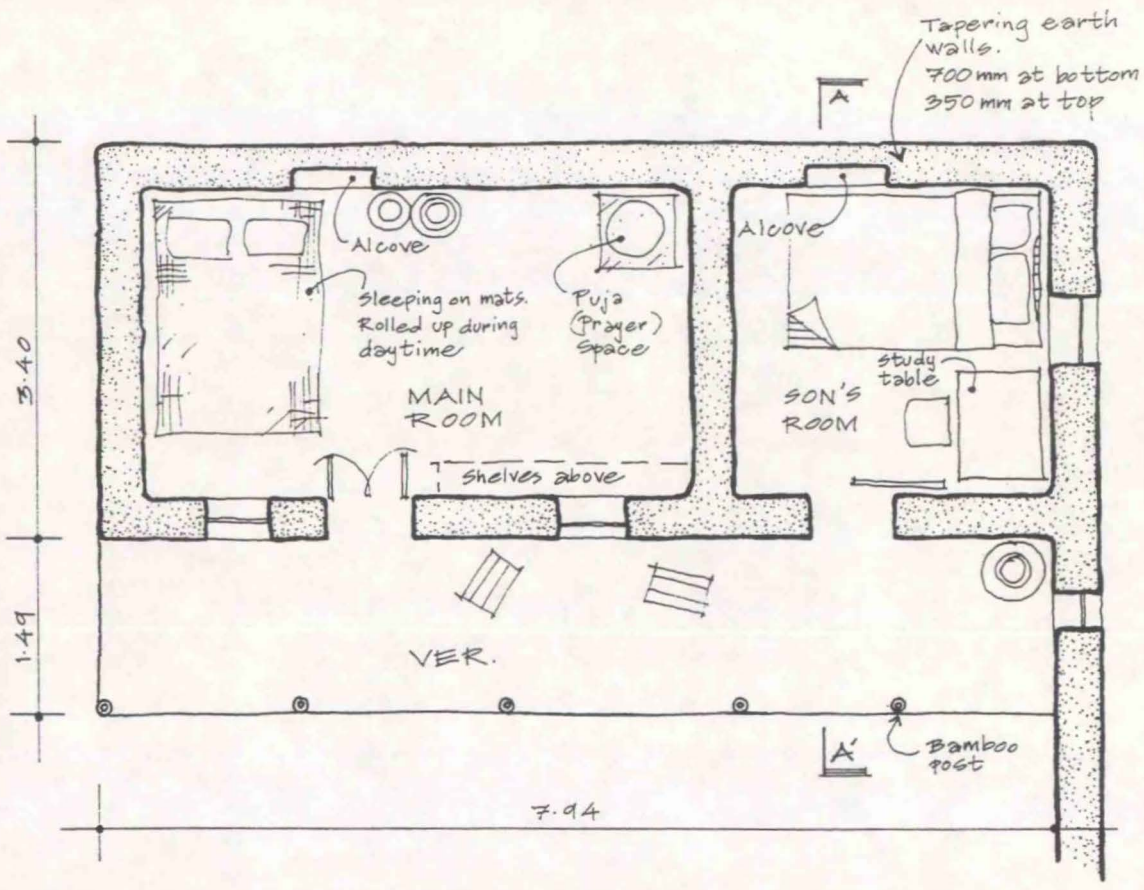

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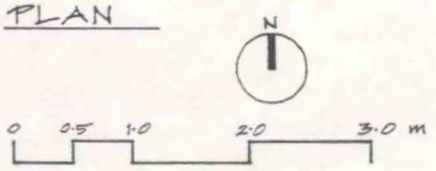

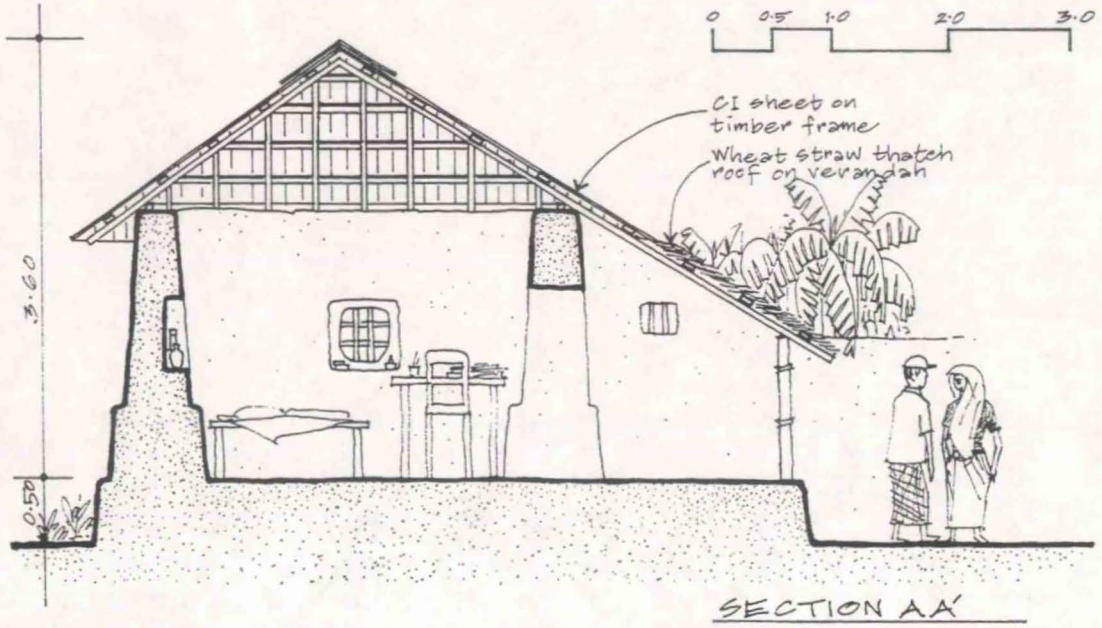

SECTION AA'

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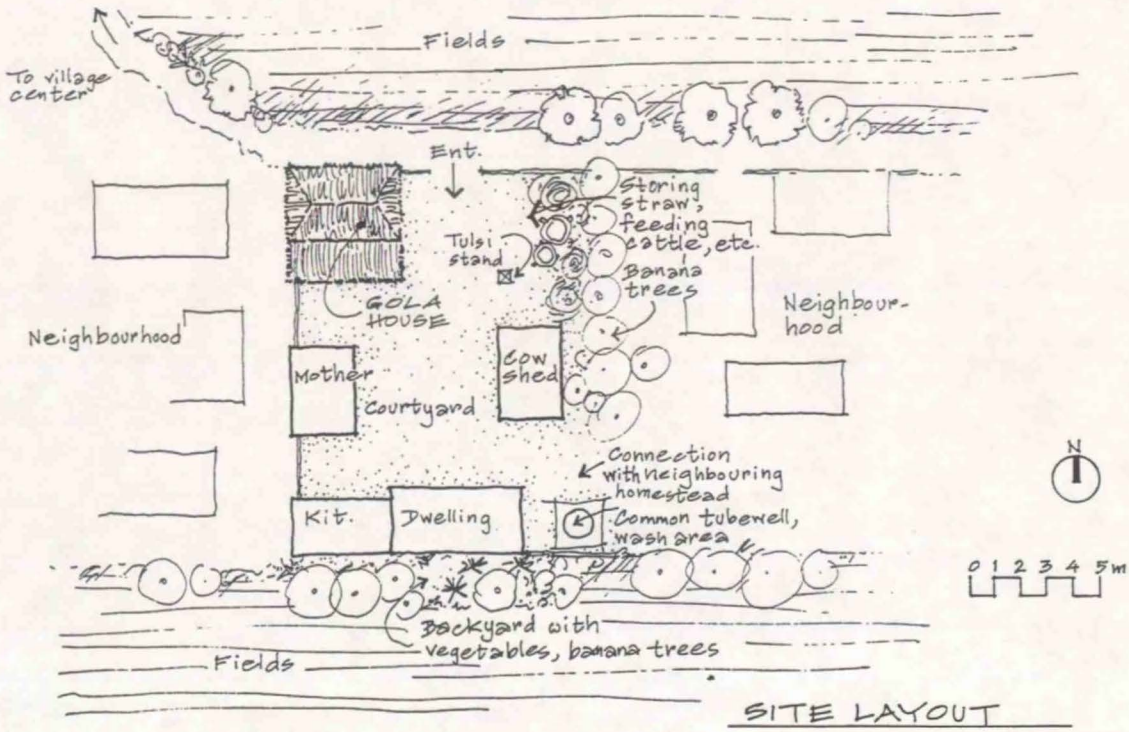
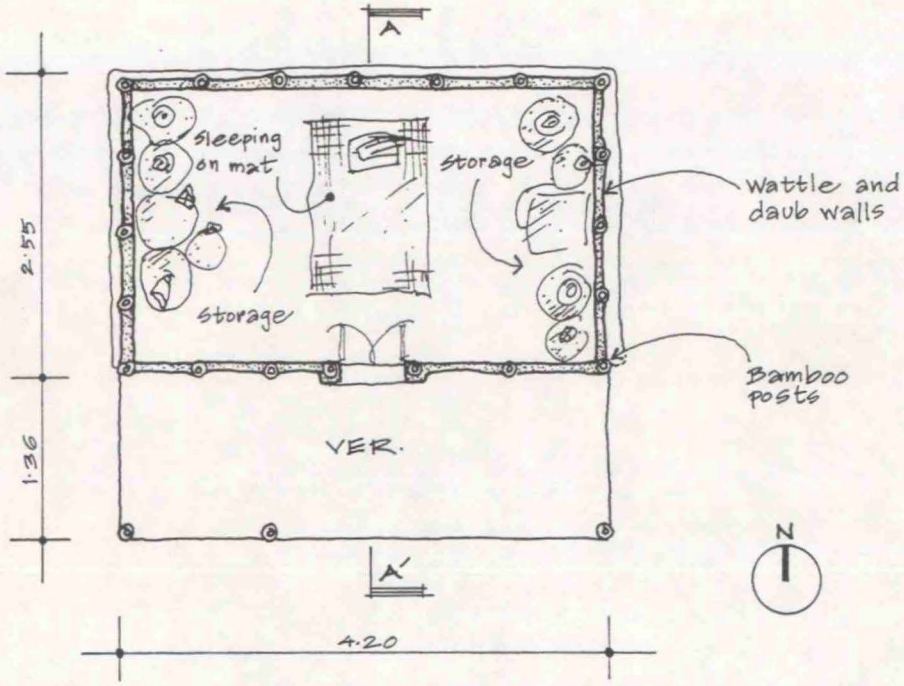


SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
4	None	Dinajpur	Jagannath Ray	1995



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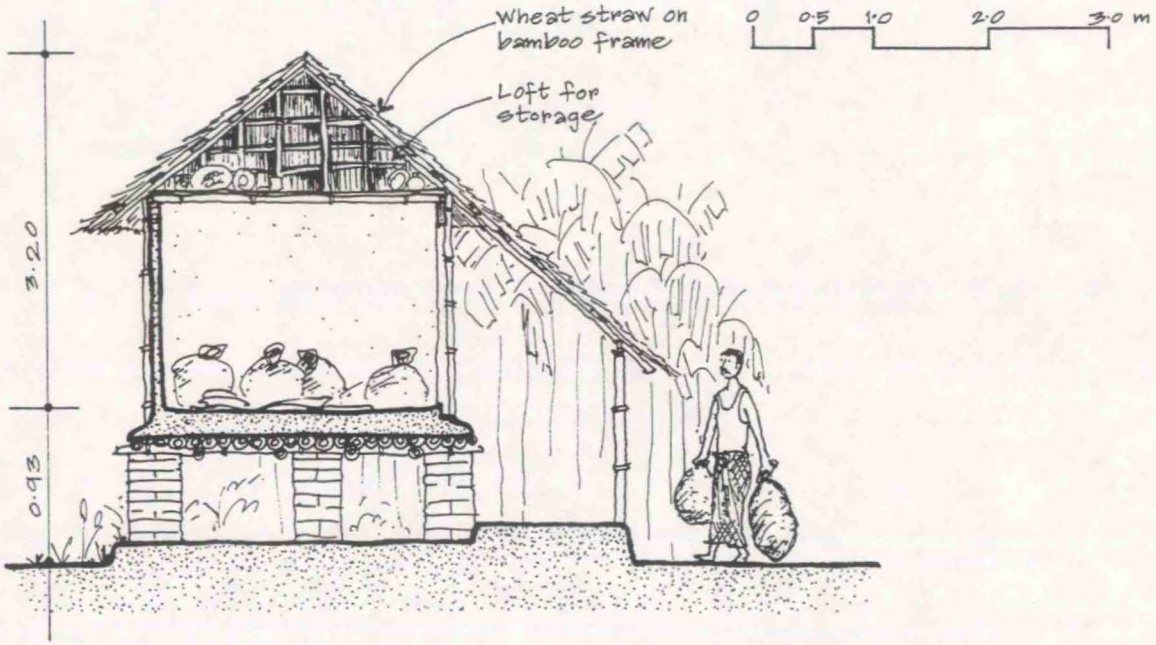

SECTION AA'

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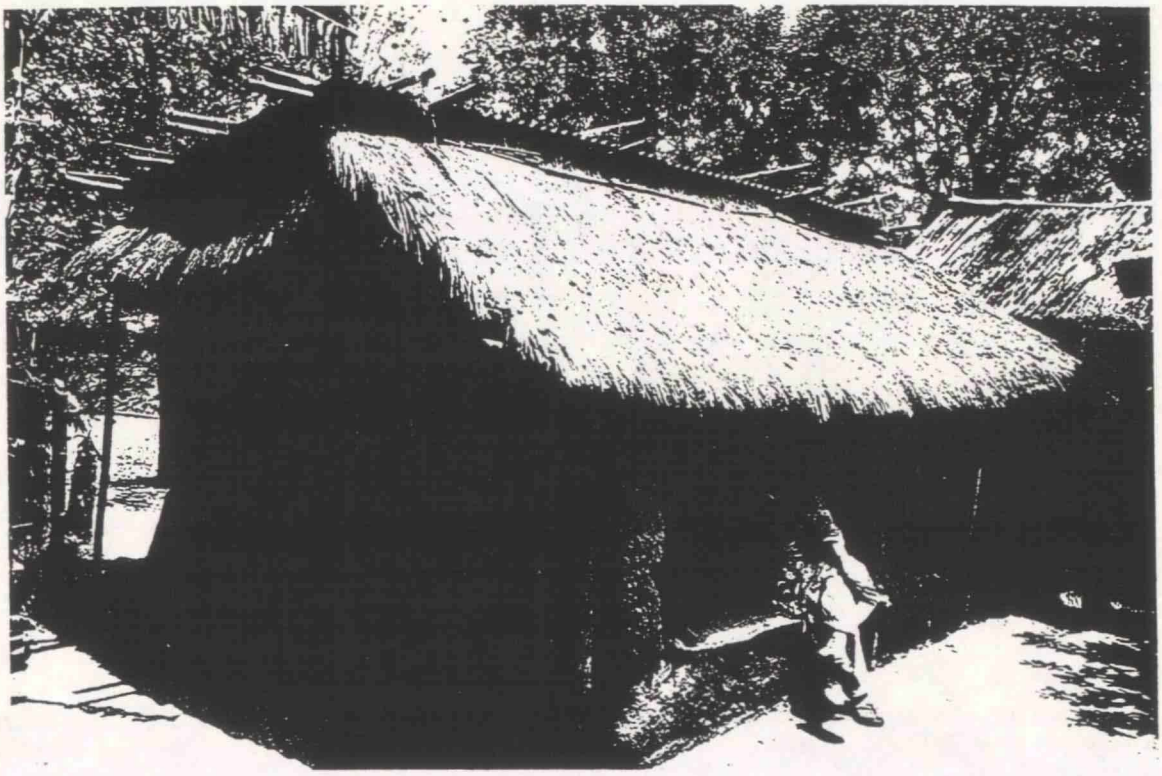
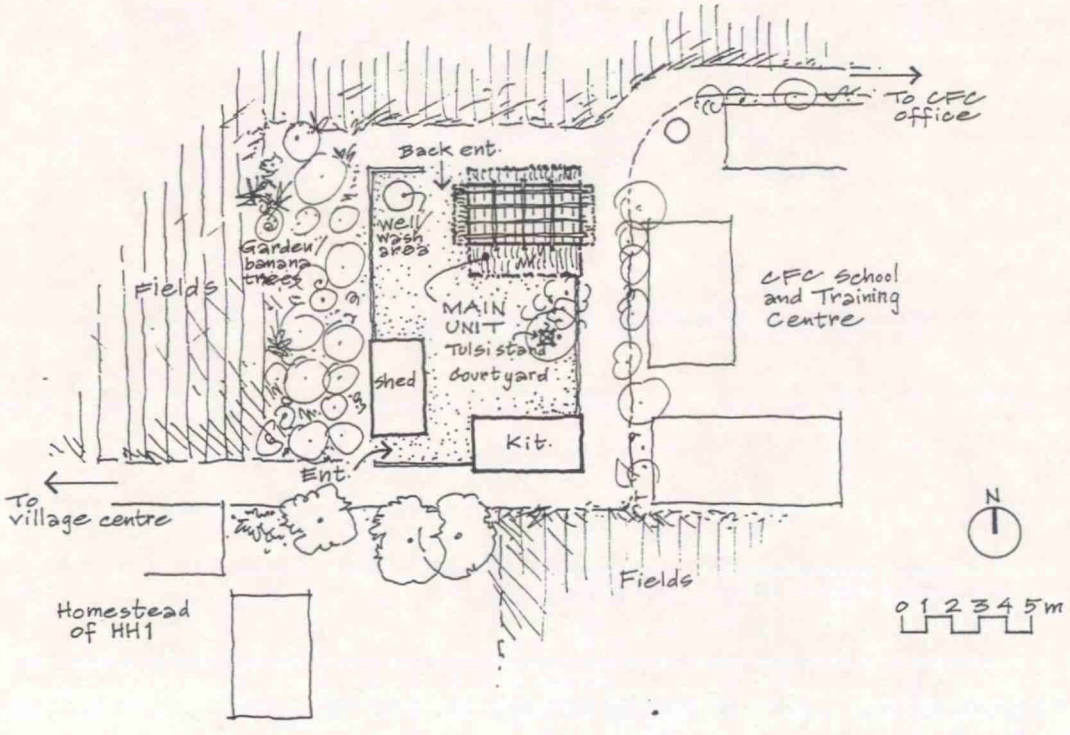
4	None	Dinajpur	Jagannath Ray	1995





SITE LAYOUT

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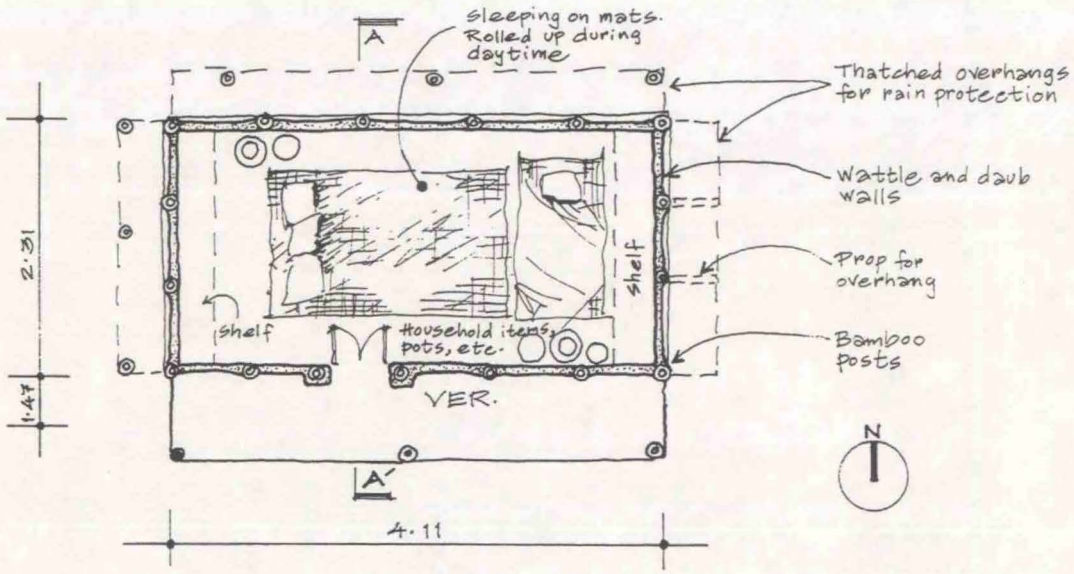

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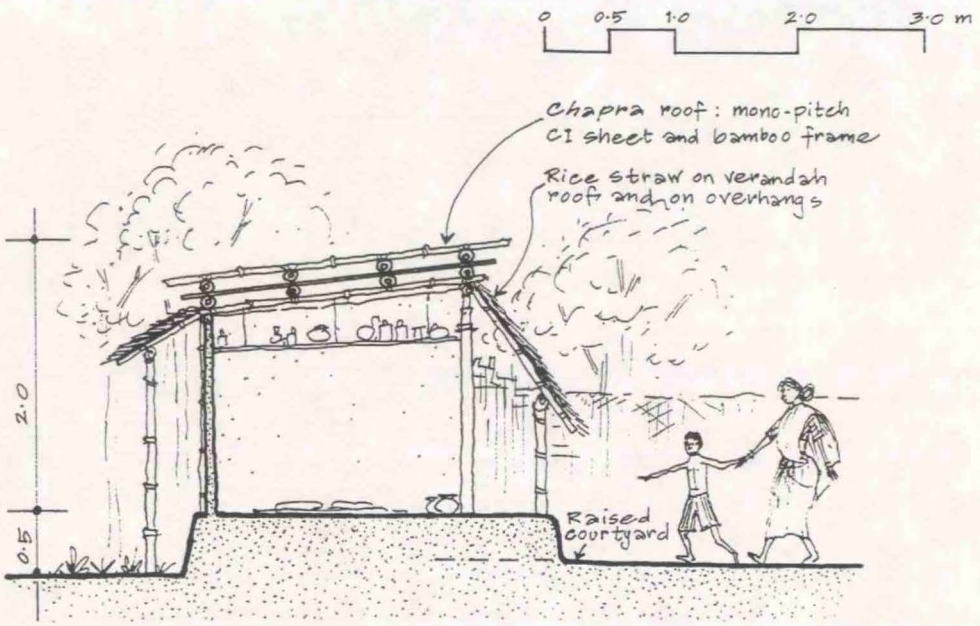

SECTION AA'

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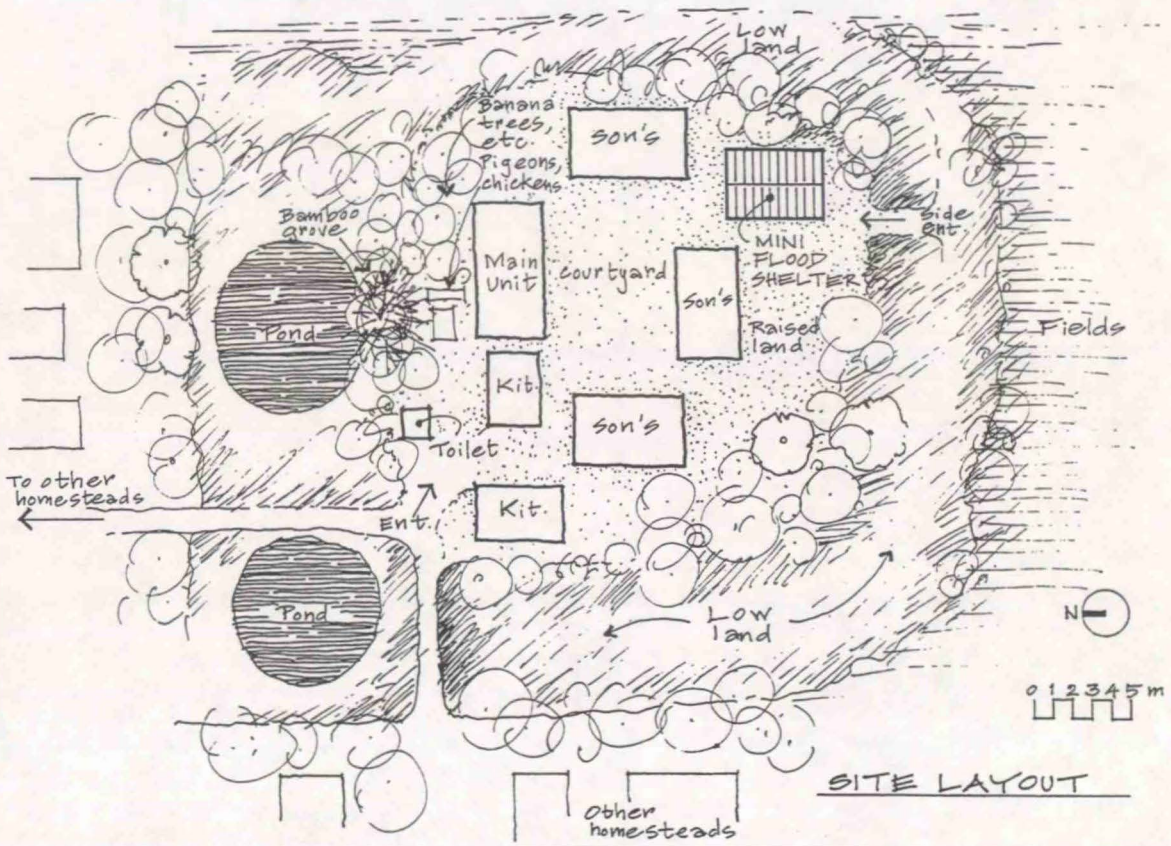

SITE LAYOUT

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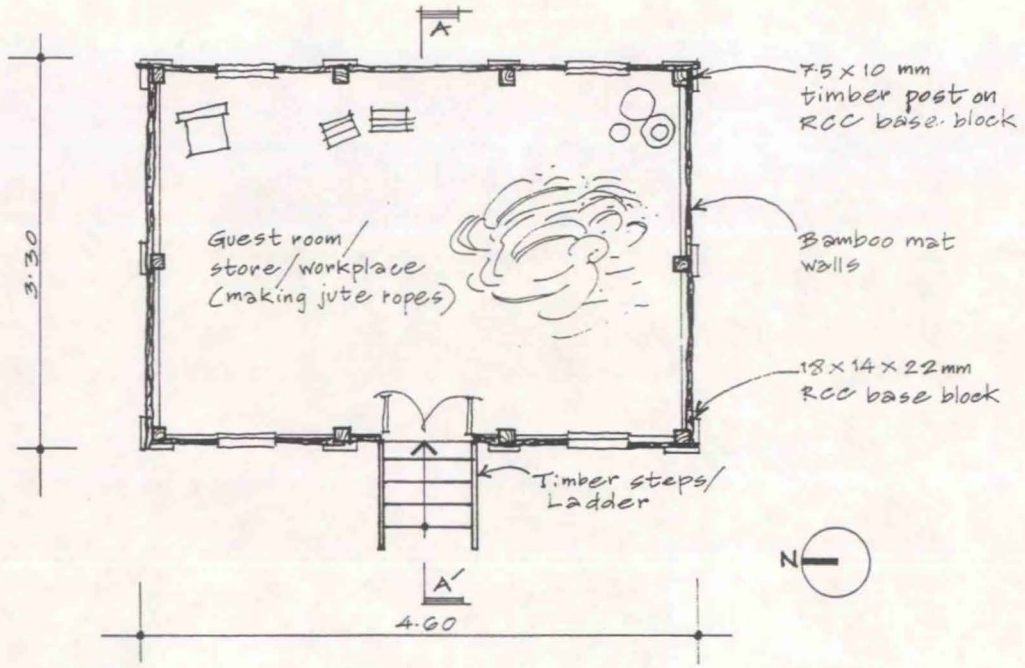

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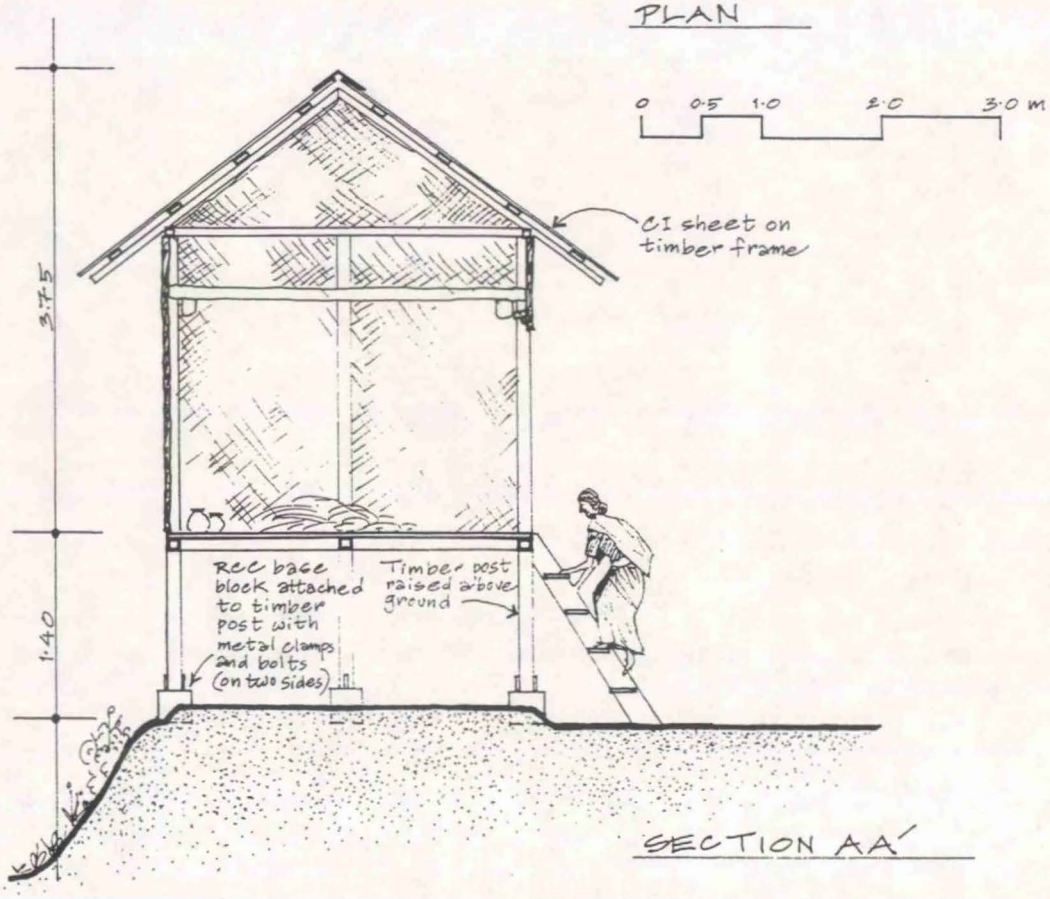

SECTION AA'

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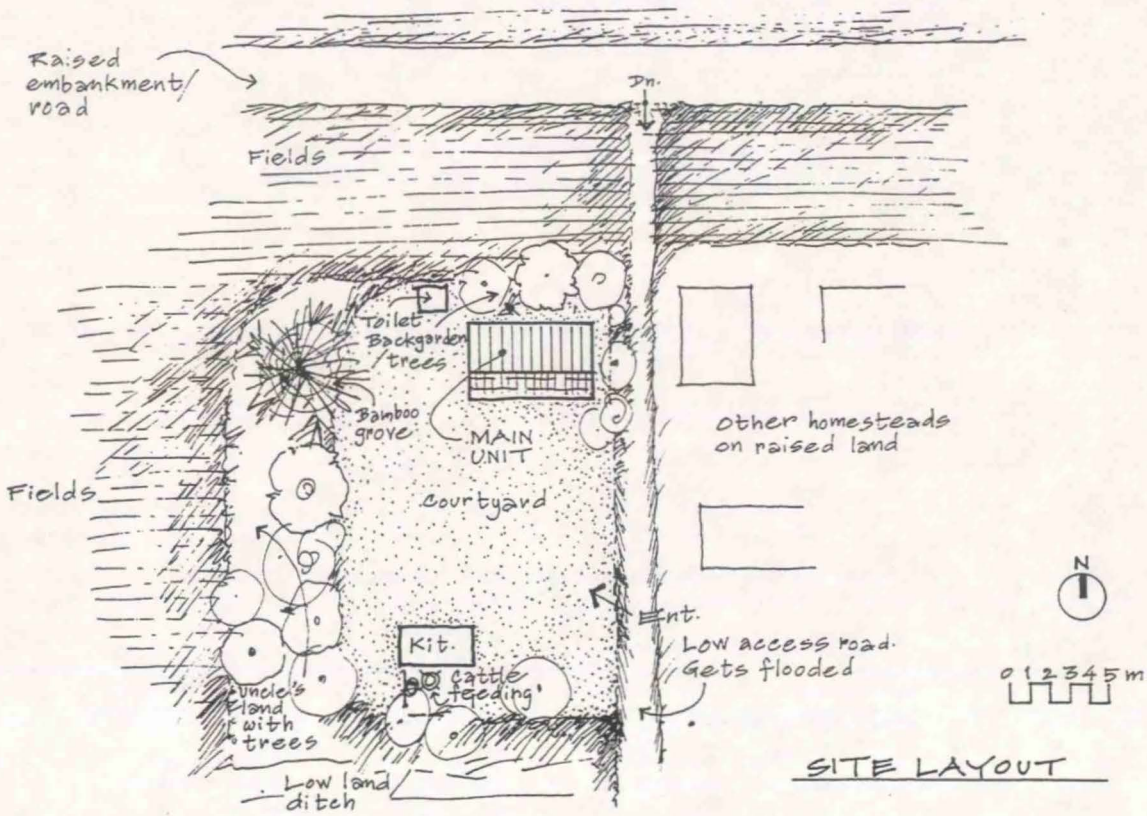
6	CCDB	Manikganj	Vanu Akhtar	1989



HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
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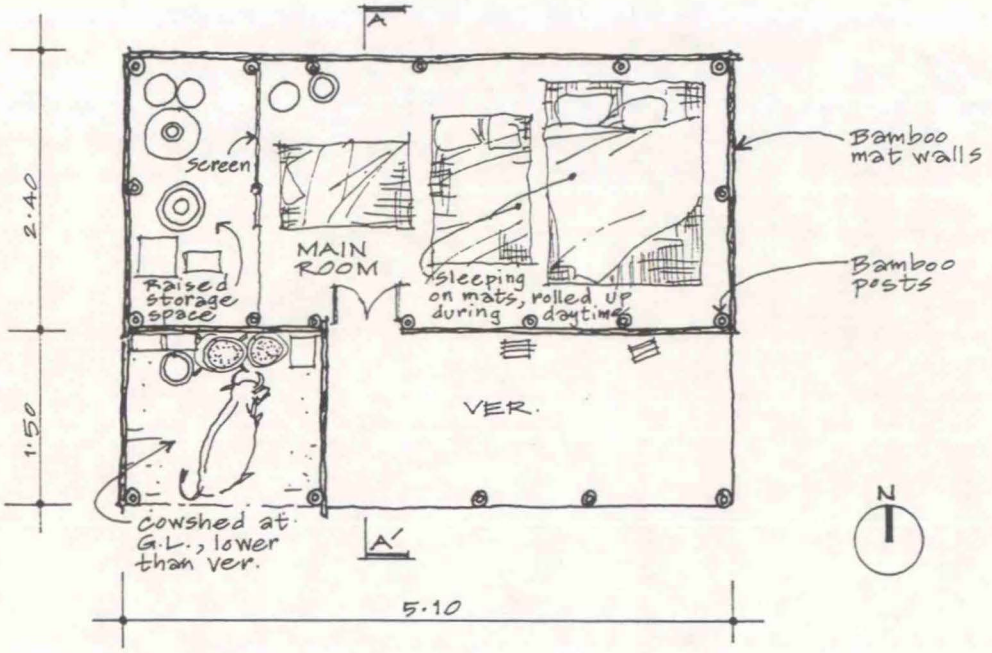

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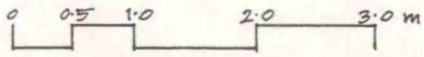

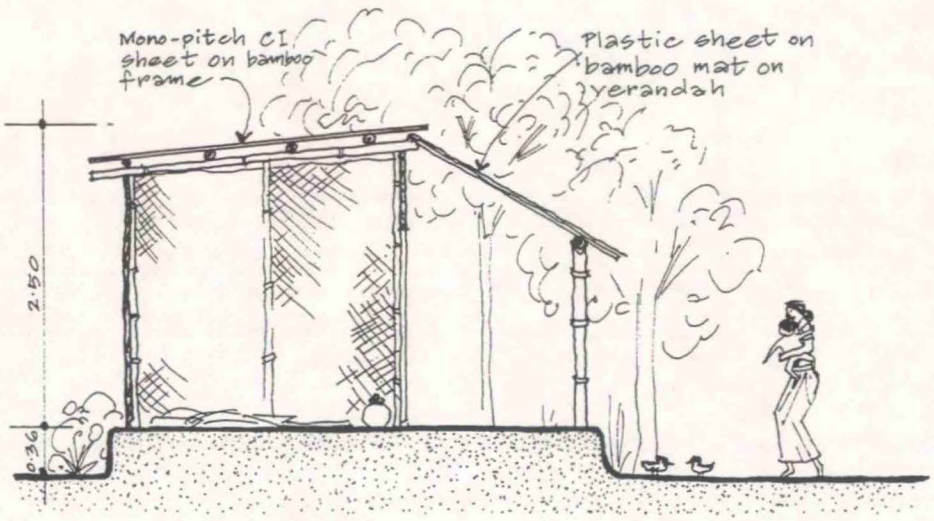

SECTION AA'

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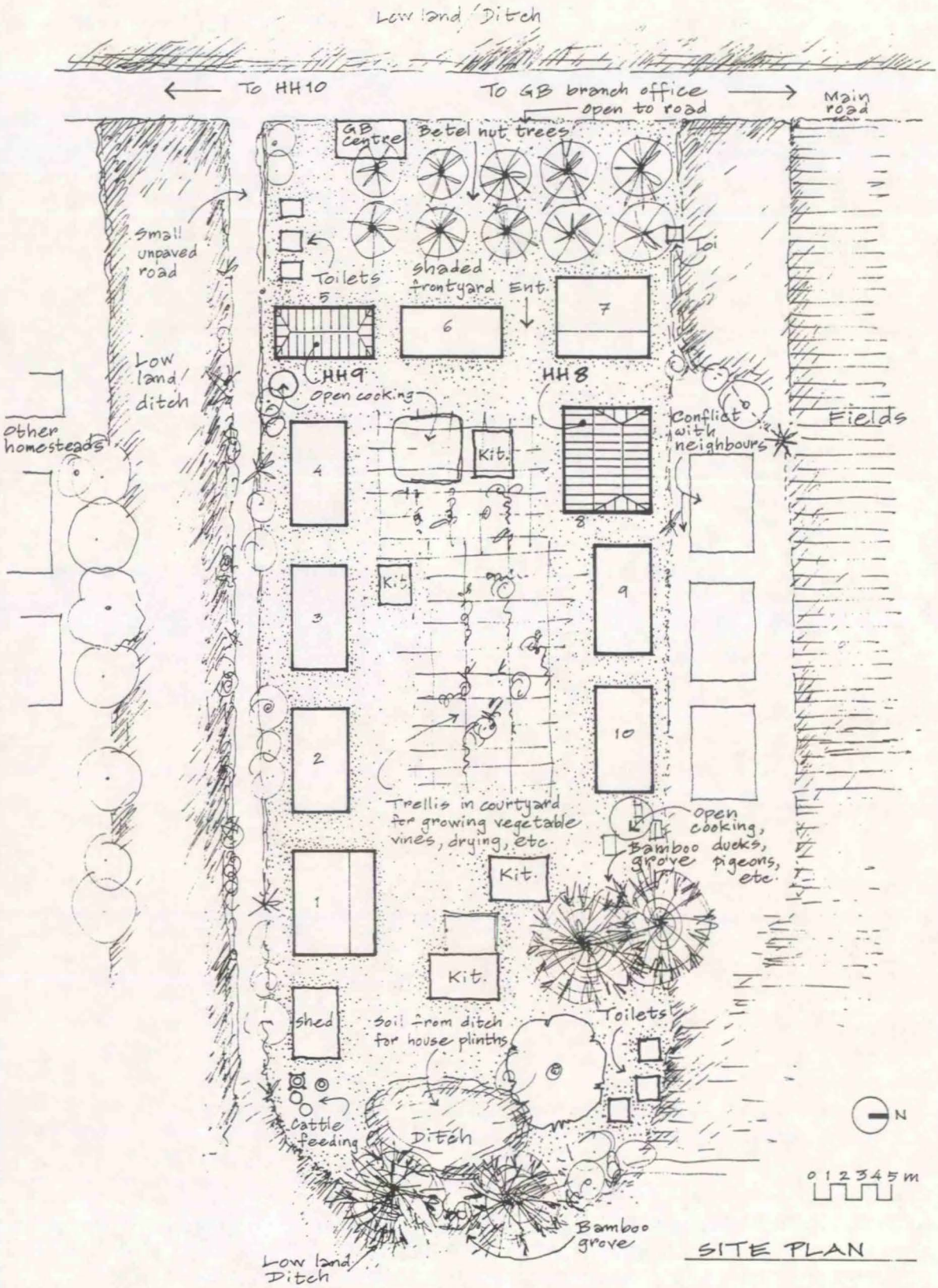
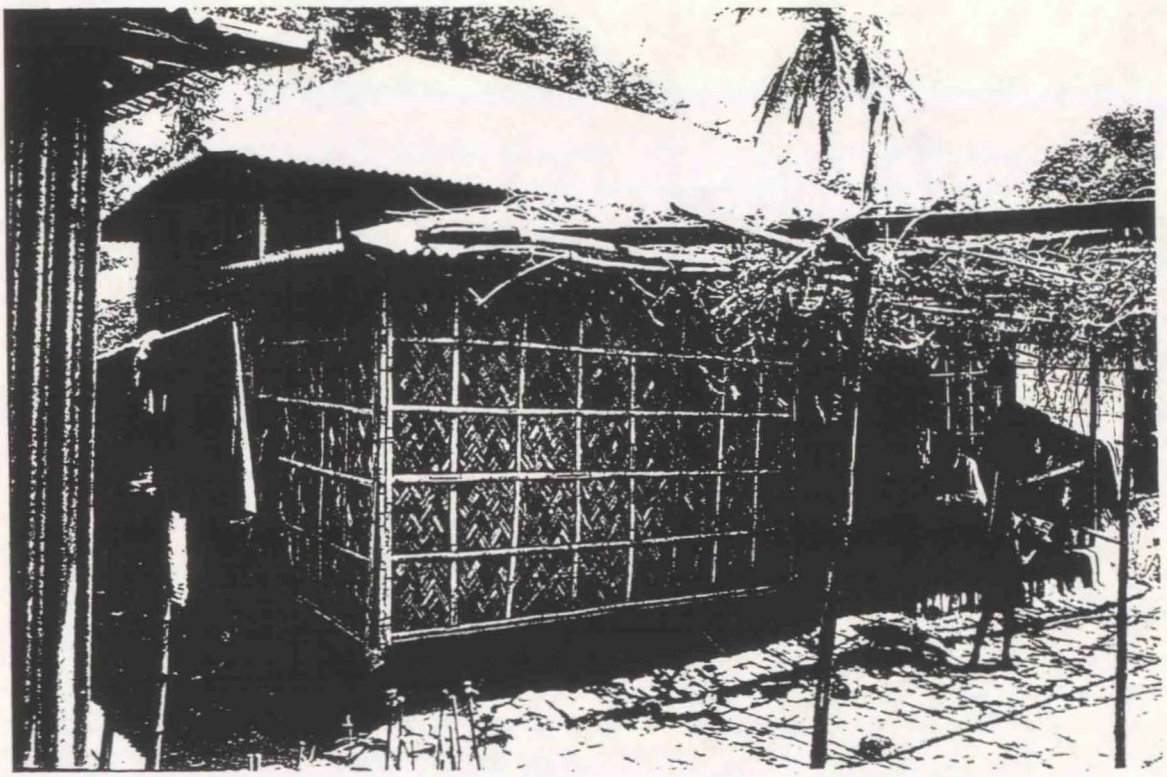
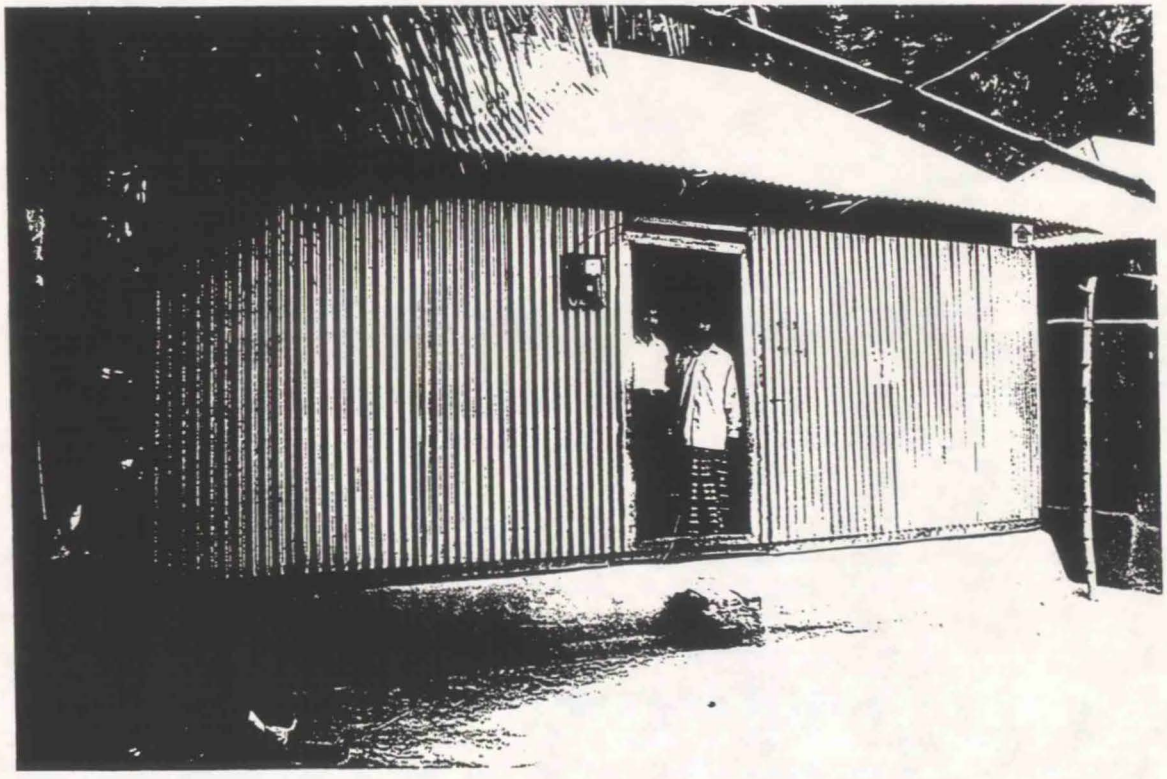
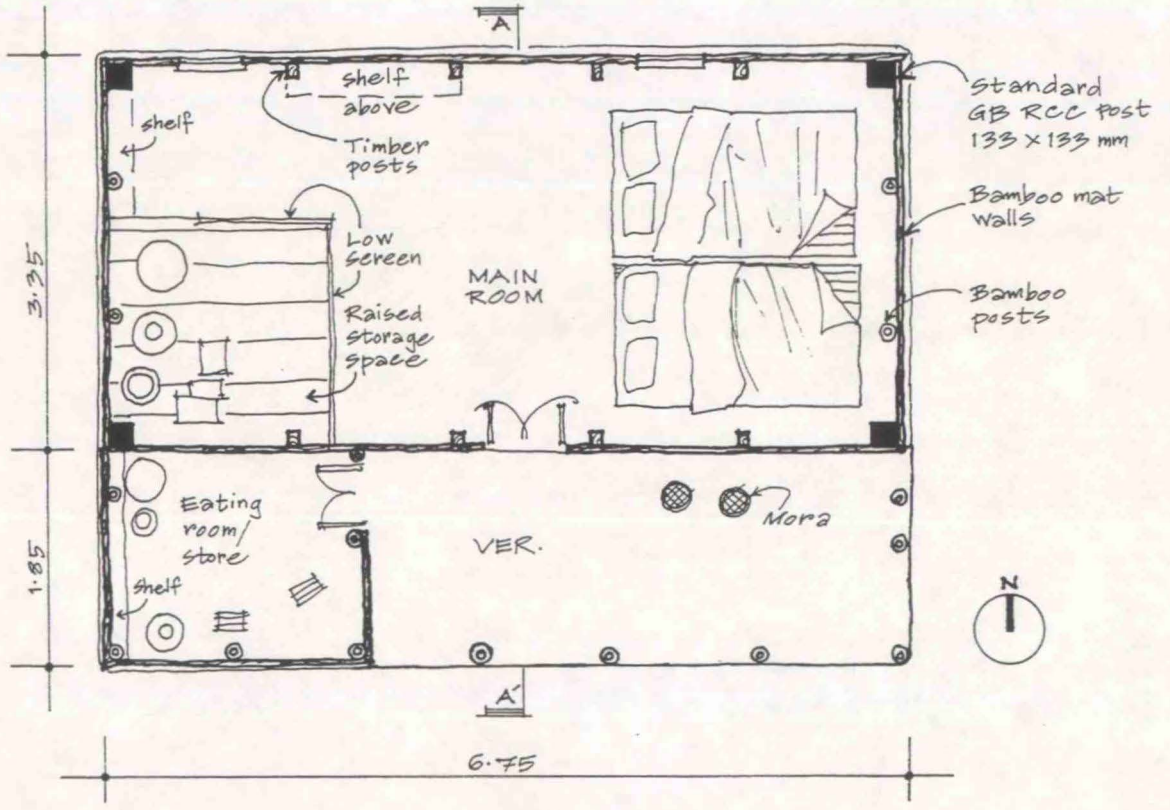


HHs	PROGRAMME	LOCATION	RESPONDENTS	YR. BUILT
8,9	GB	Manikganj	Naz Jahan Moinu Mia	1993





HHs	PROGRAMME	LOCATION	RESPONDENTS	YR. BUILT
8,9	GB	Manikganj	Naz Jahan Moinu Mia	1993



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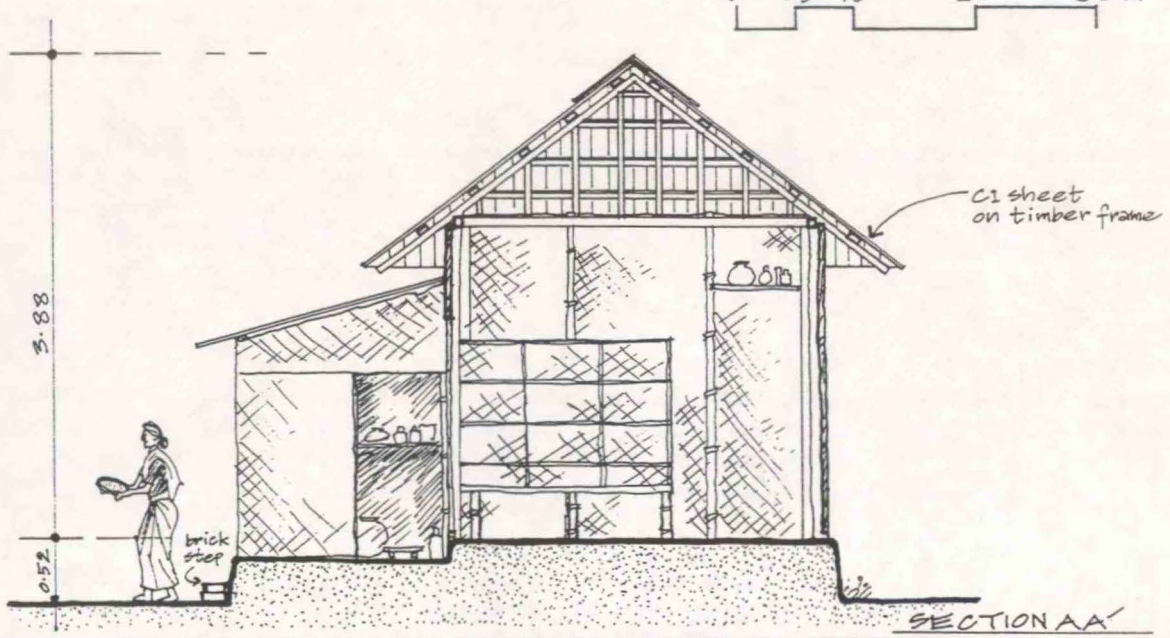

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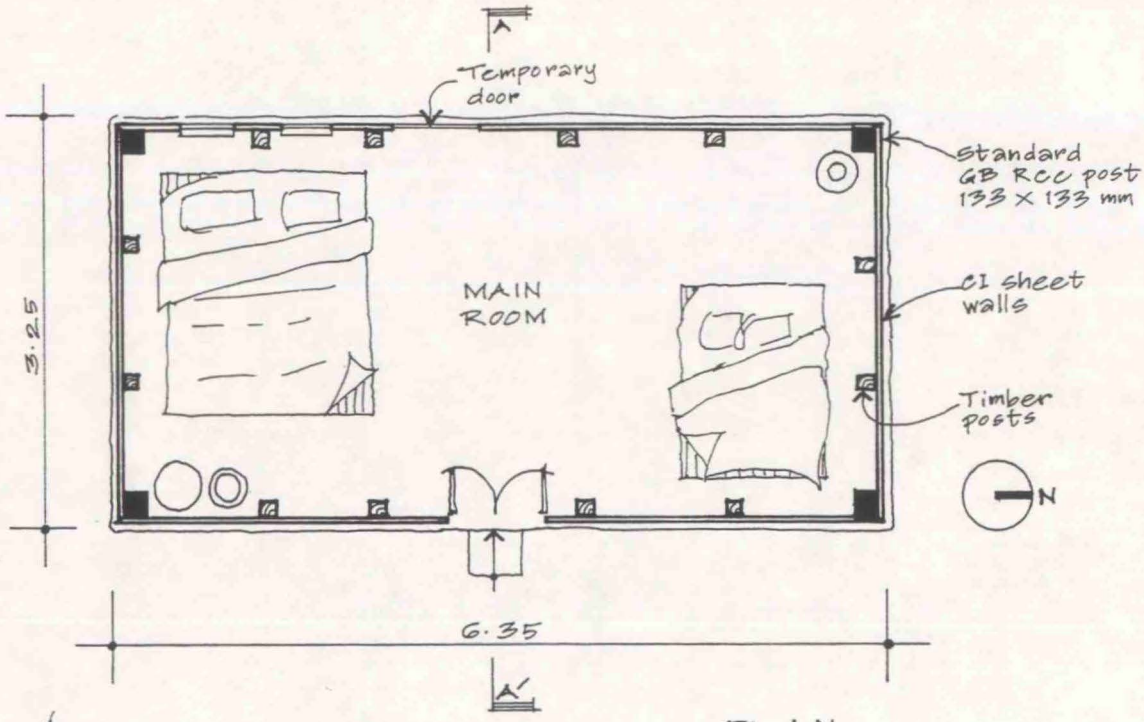

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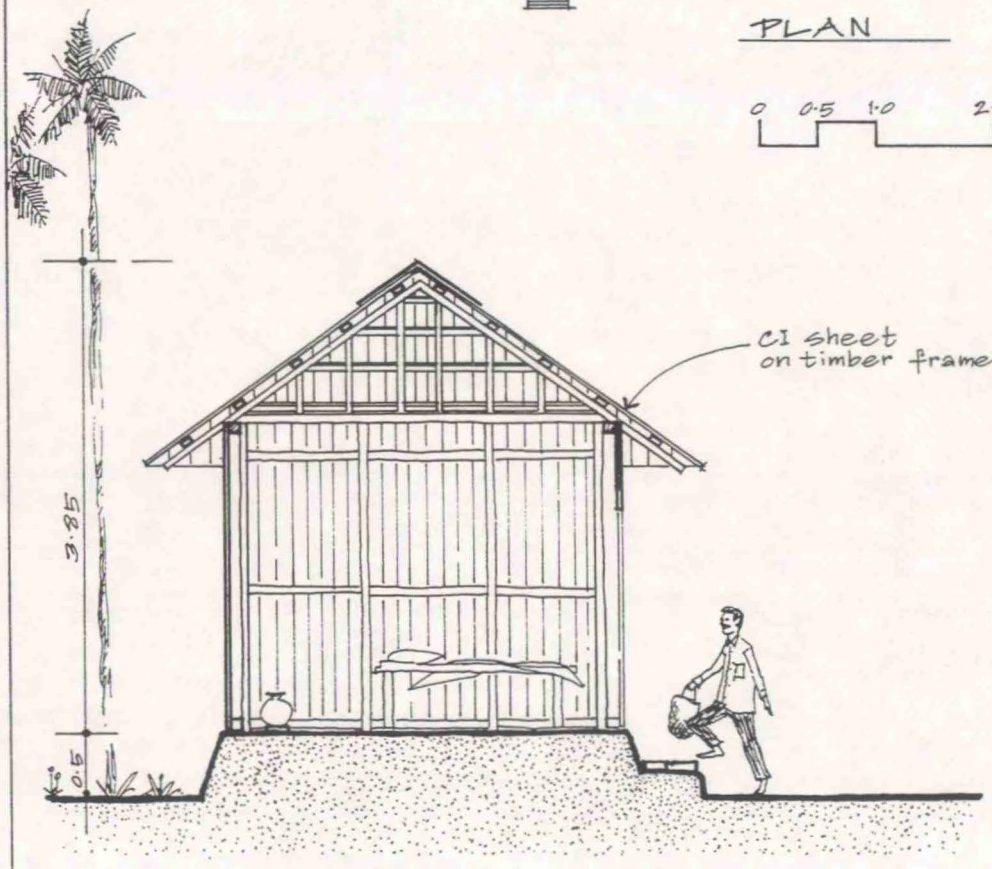

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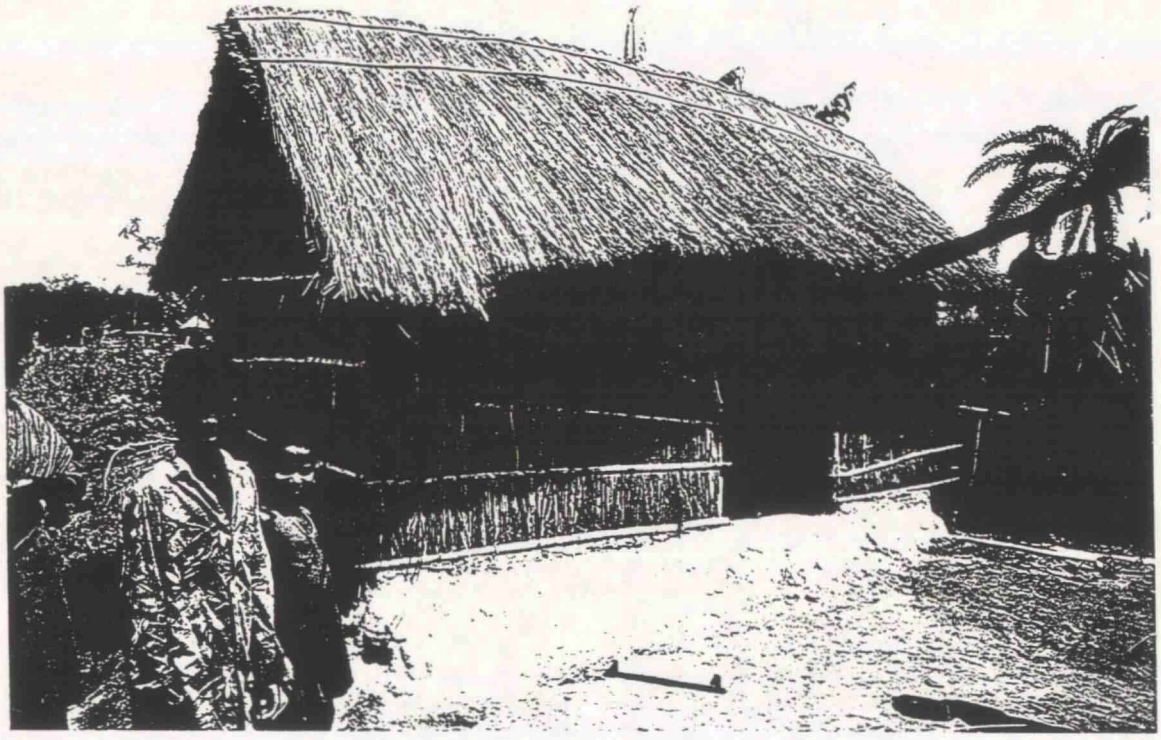

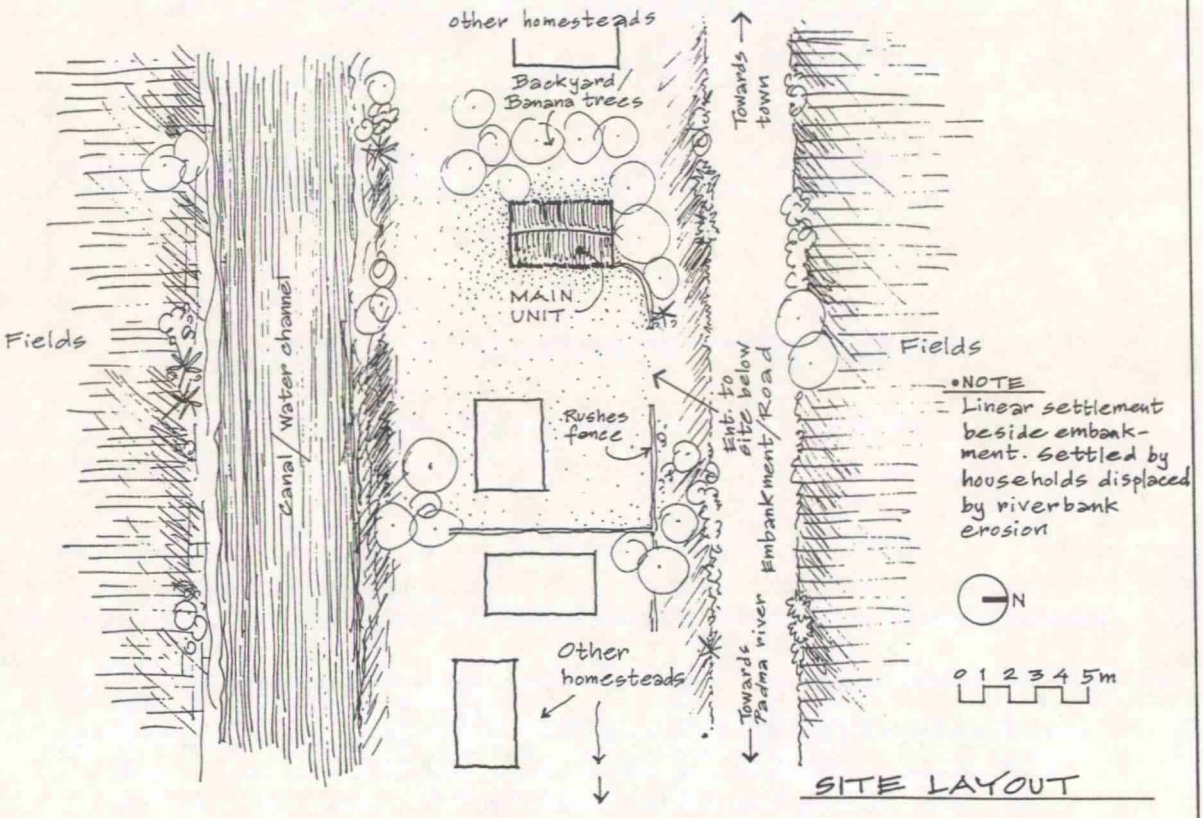

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
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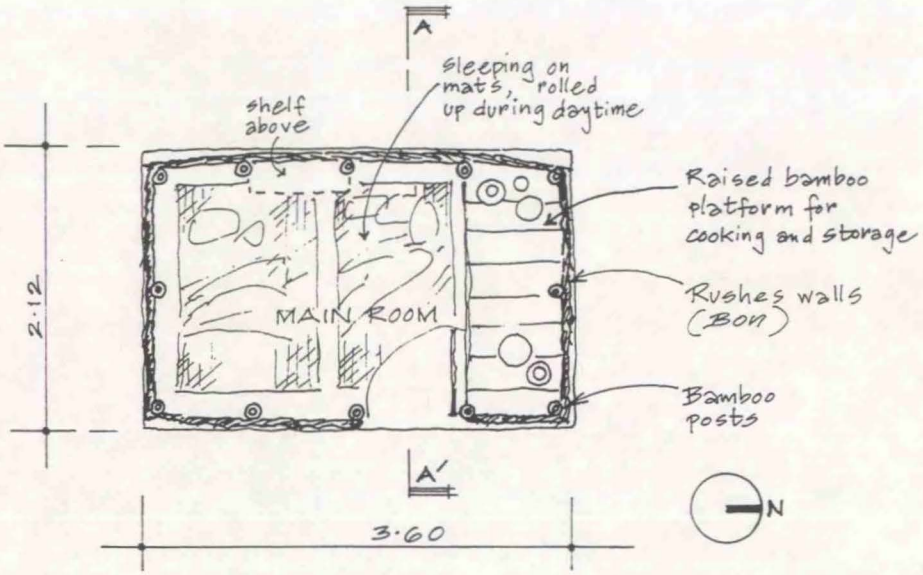
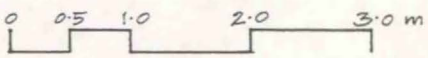
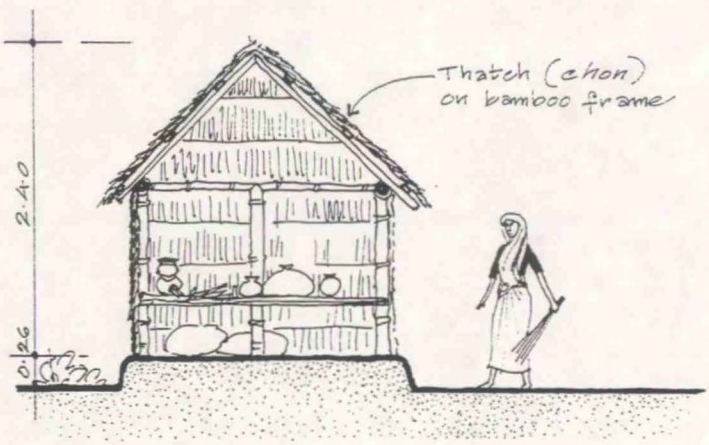


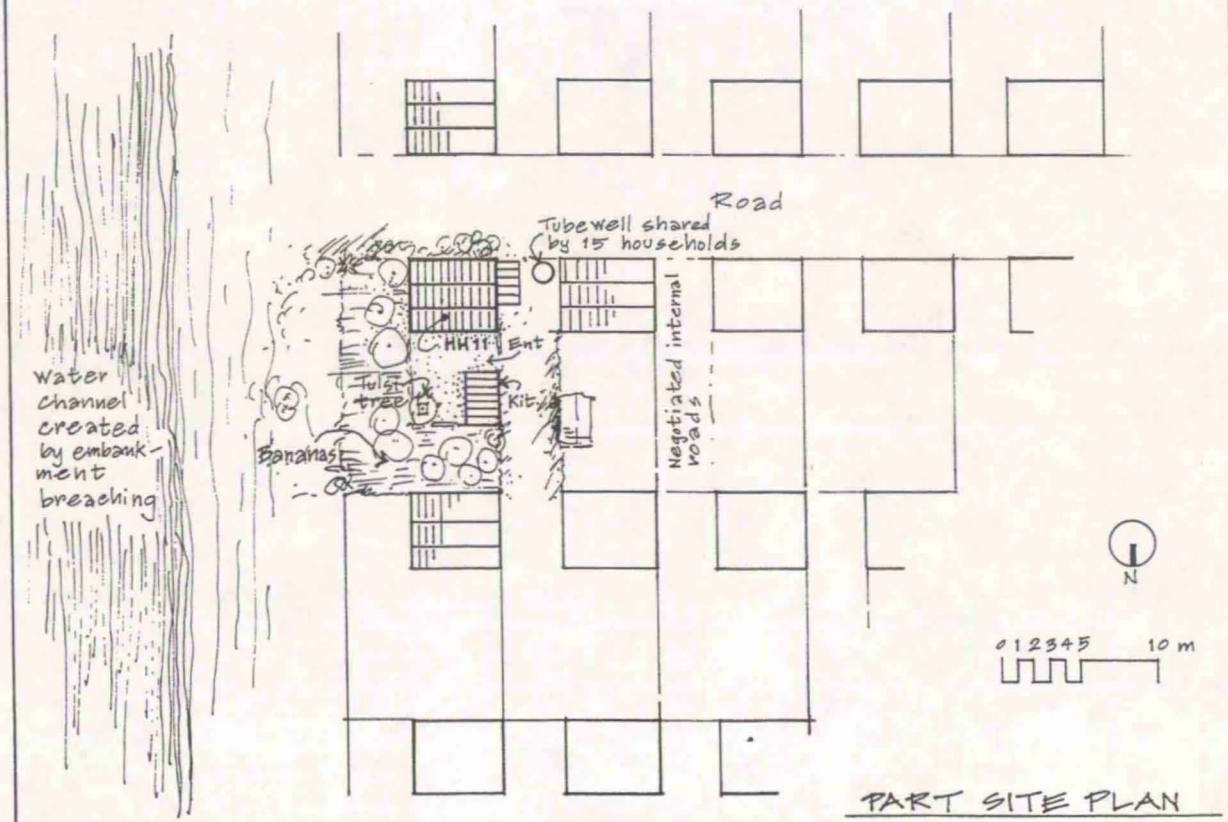
PLAN





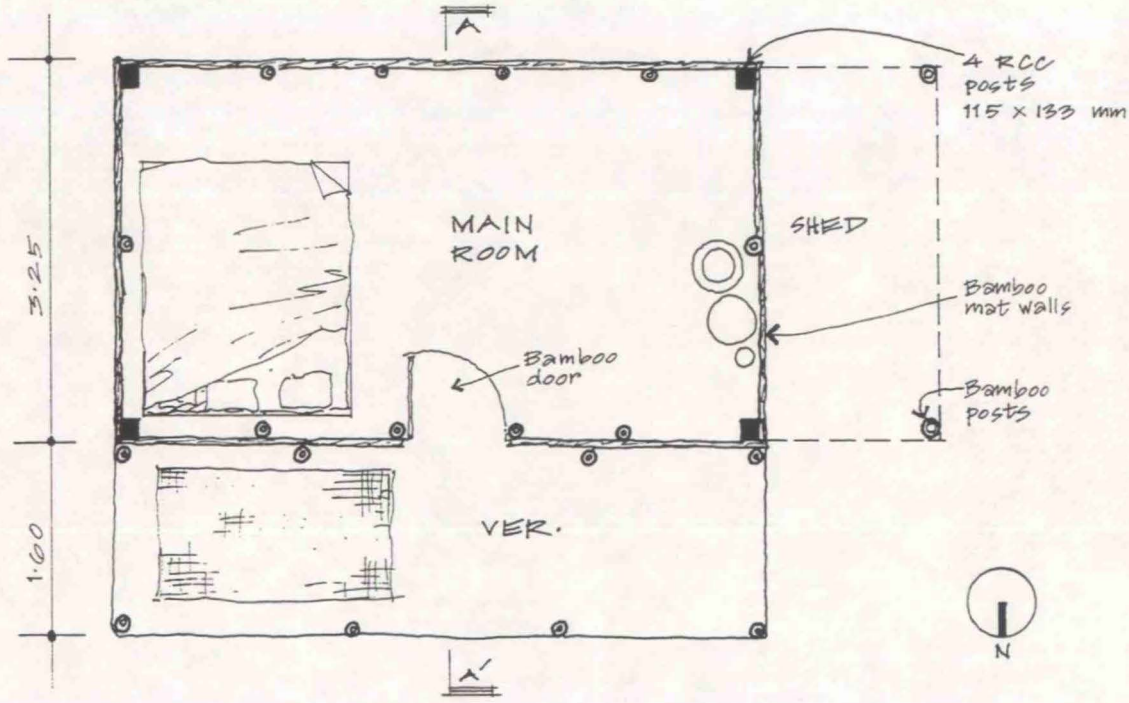
SECTION AA'

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
10	None	Manikganj	Sharmila Begum	1992



PART SITE PLAN

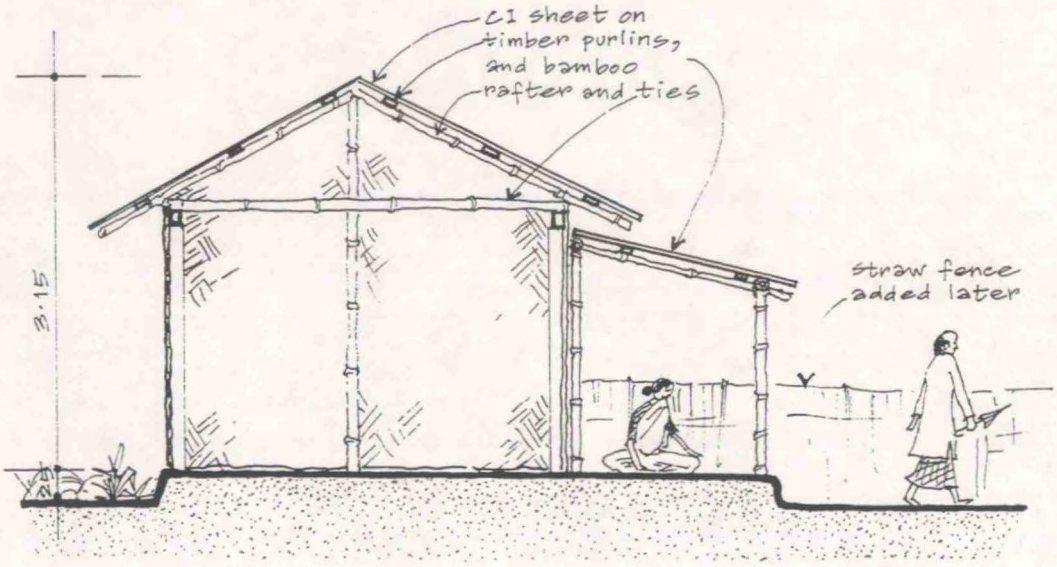
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
11	AG	Dinajpur	Shudipto Chandra Ray	1993



PLAN

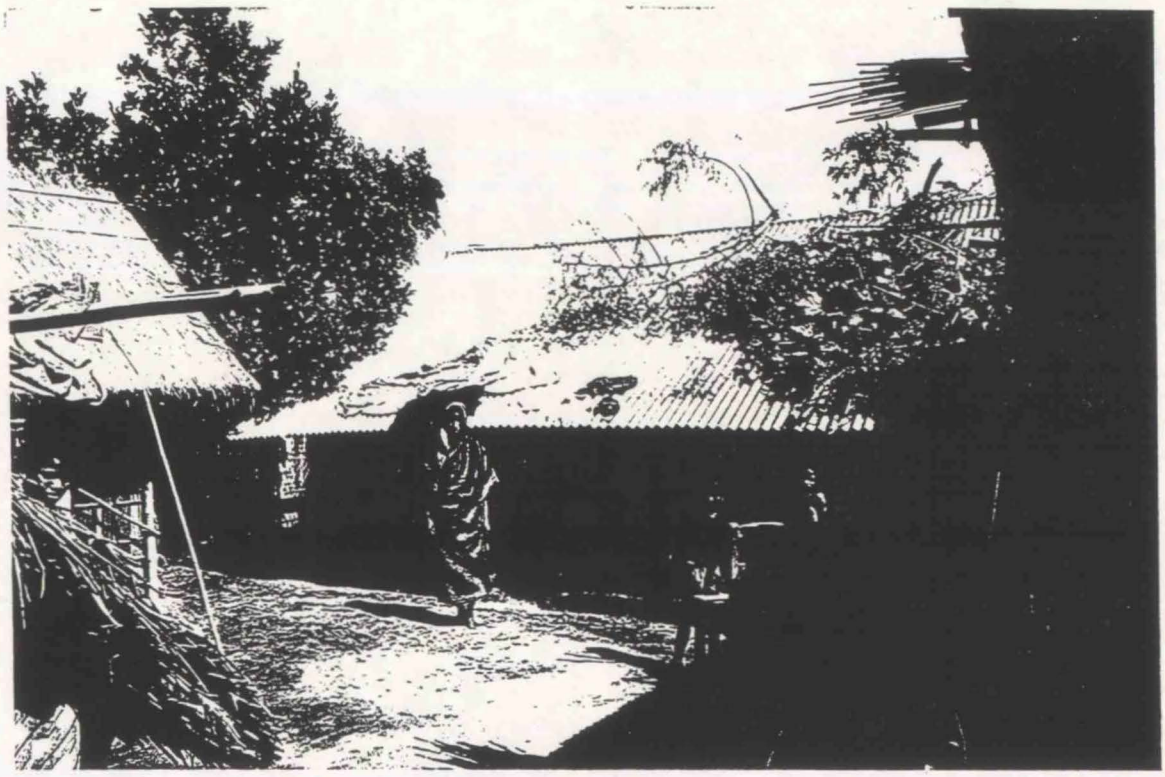
5.55

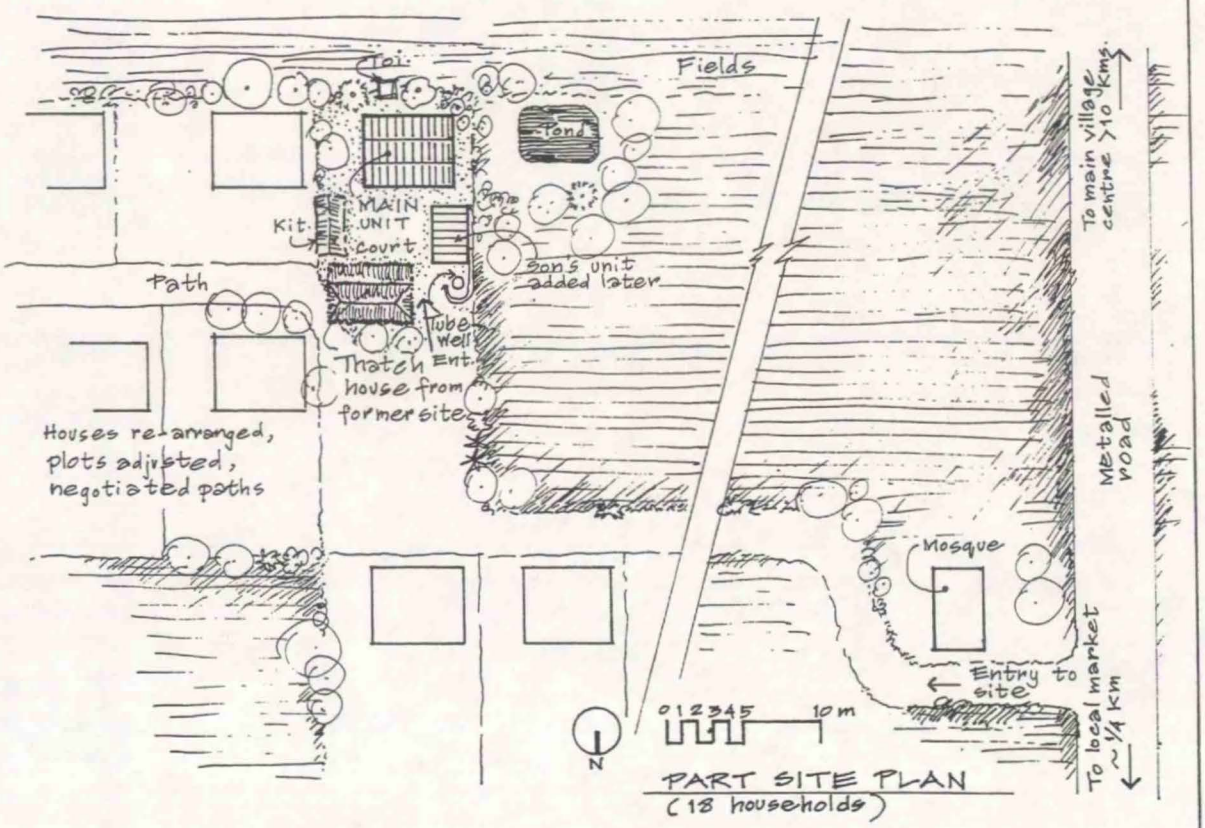
0 0.5 1.0 2.0 3.0 m



SECTION AA'

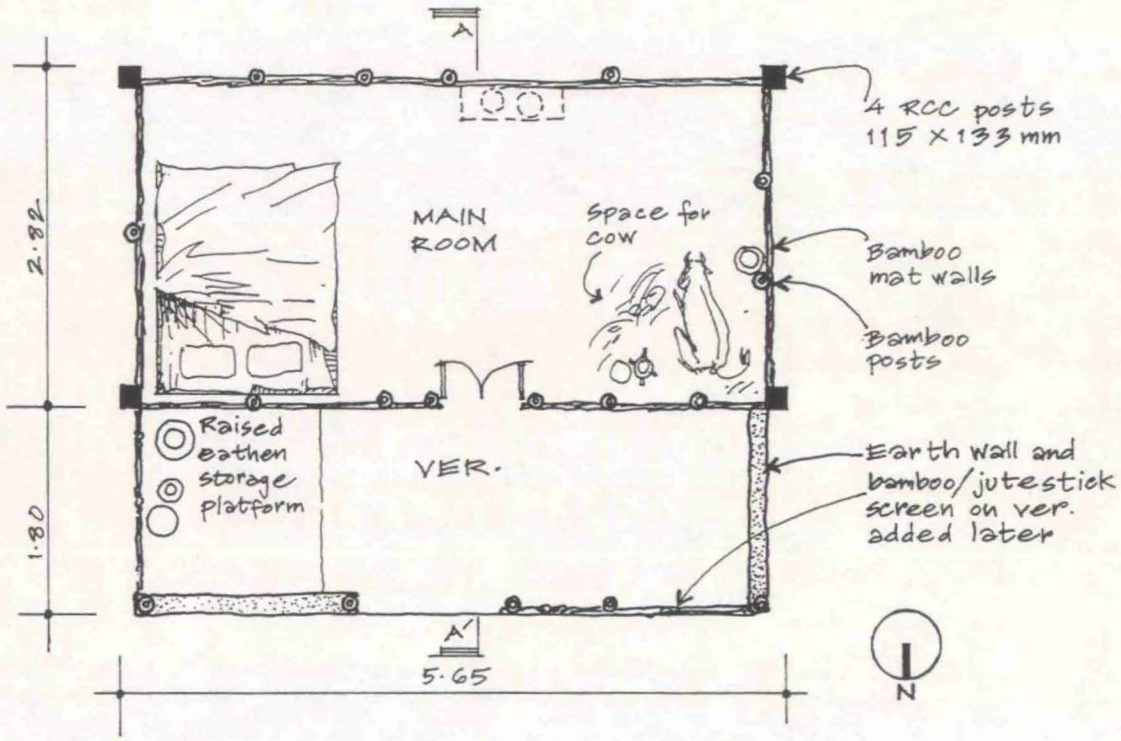
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
11	AG	Dinajpur	Shudipto Chandra Ray	1993





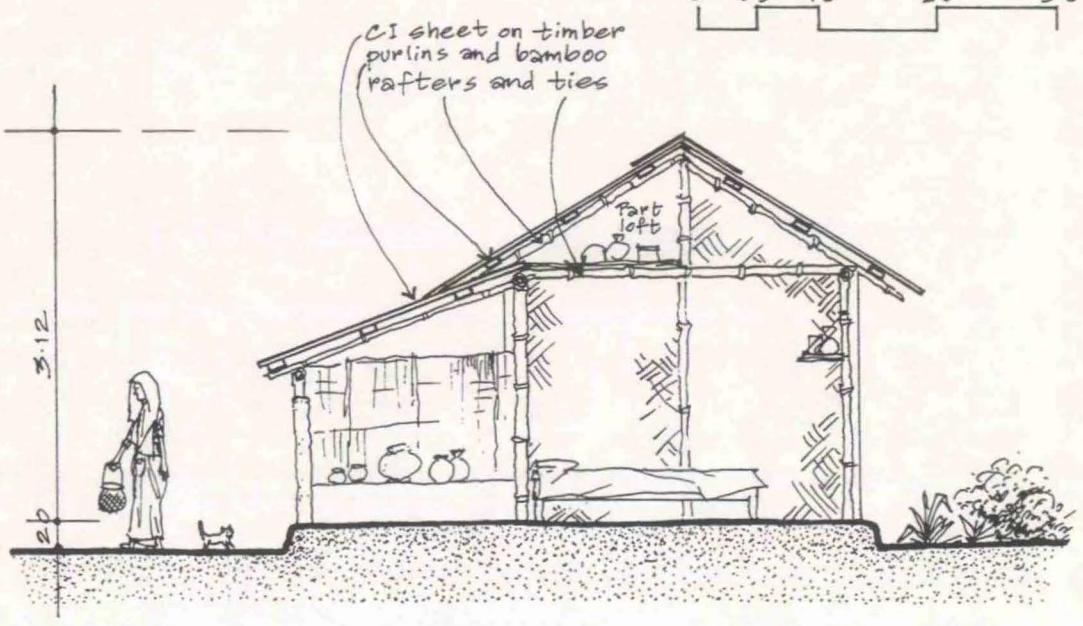
PART SITE PLAN
(18 households)

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
12	AG	Dinajpur	Rohima Khatun	1993



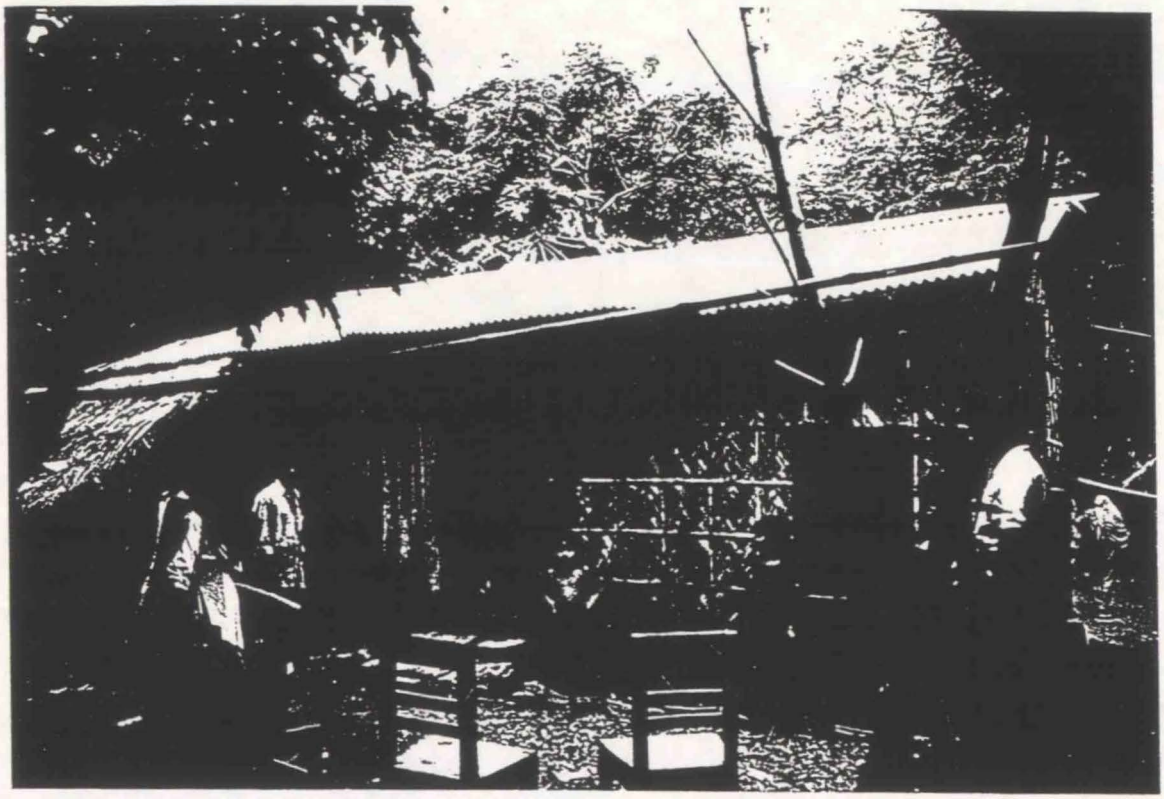
PLAN

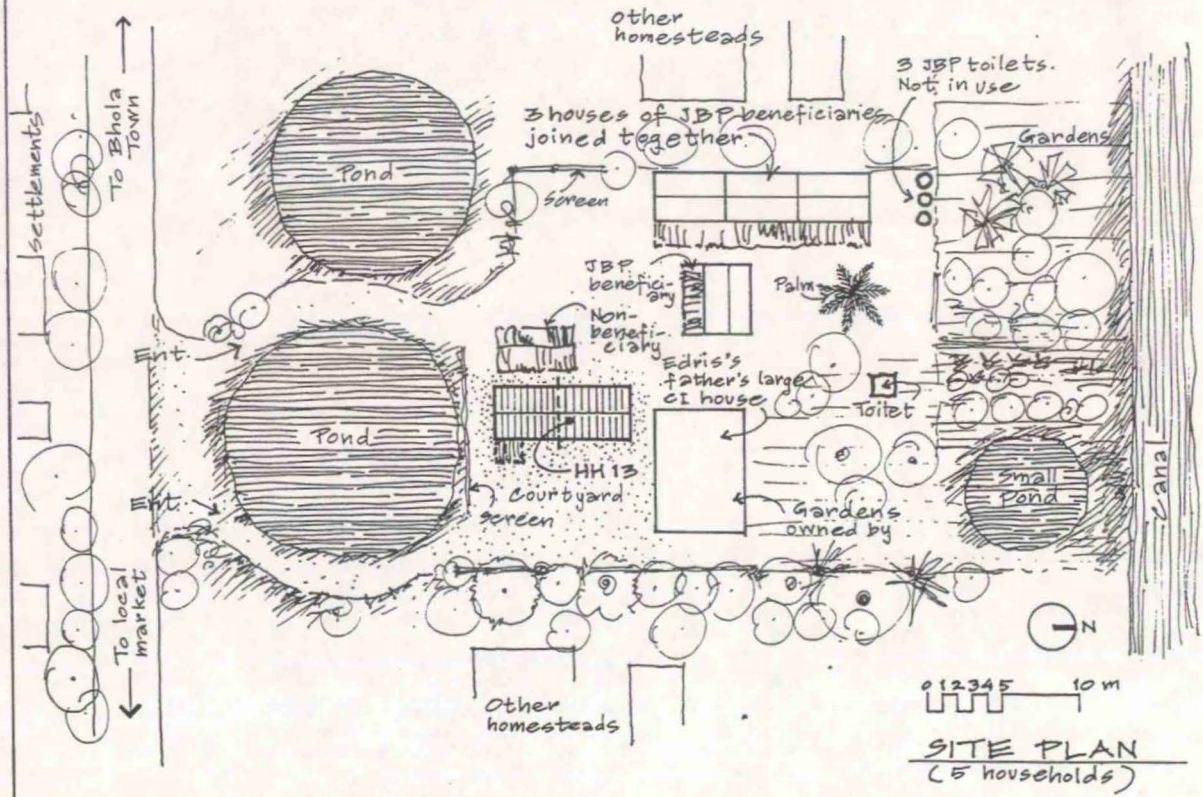
0 0·5 1·0 2·0 3·0 m



SECTION AA'

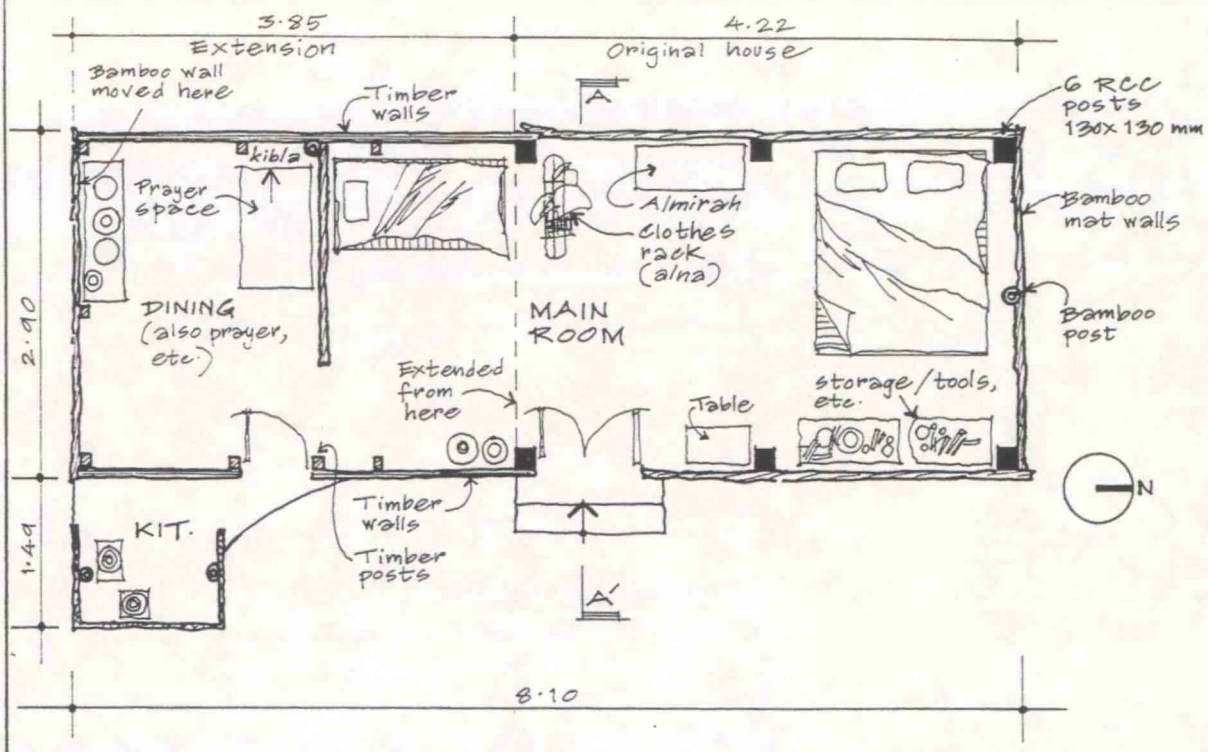
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
12	AG	Dinajpur	Rohima Khatun	1993





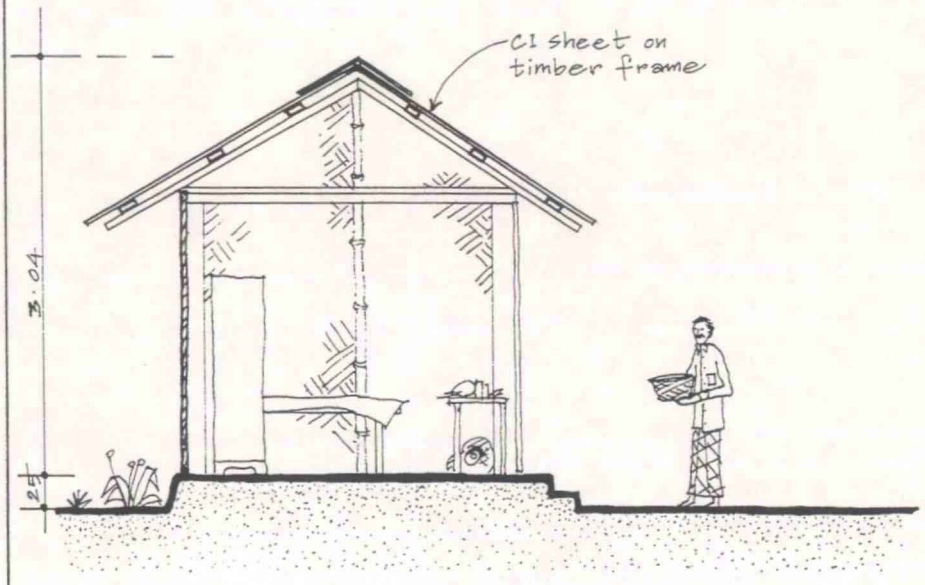
SITE PLAN
(5 households)

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
13	JBP-LGED	Bhola	Mohammed Ejaz	1993



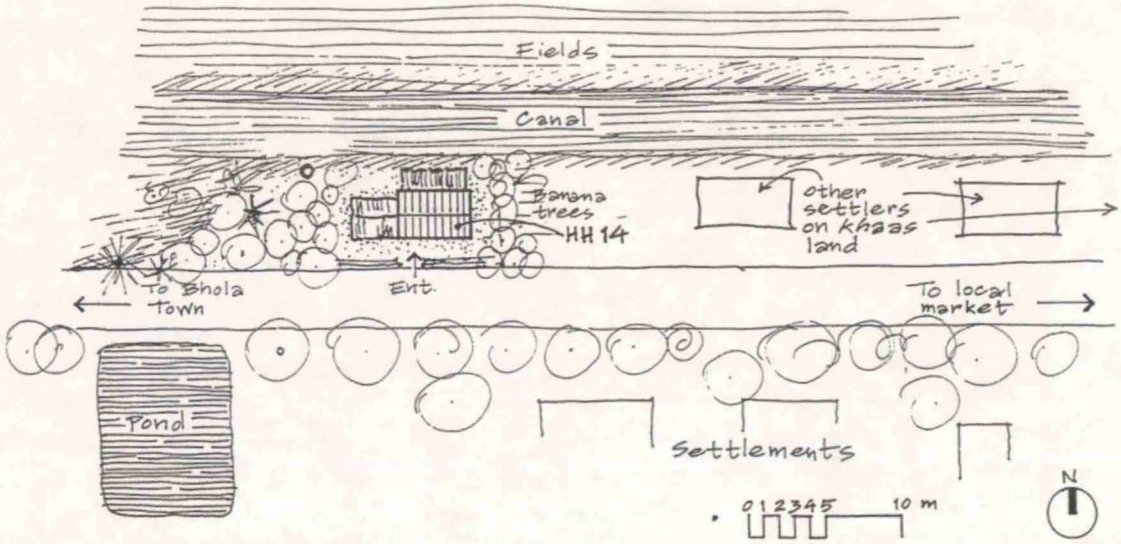
PLAN

0 0.5 1.0 2.0 3.0 m



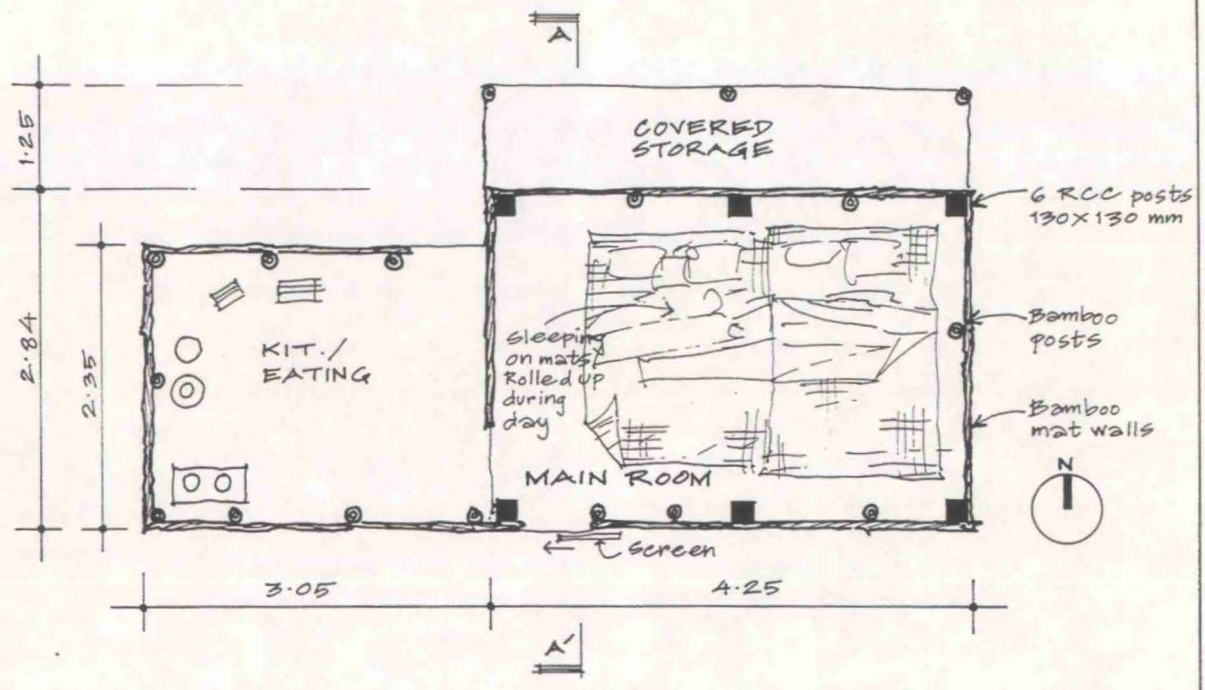
SECTION AA'

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
13	JBP-LGED	Bhola	Mohammed Ejaz	1993



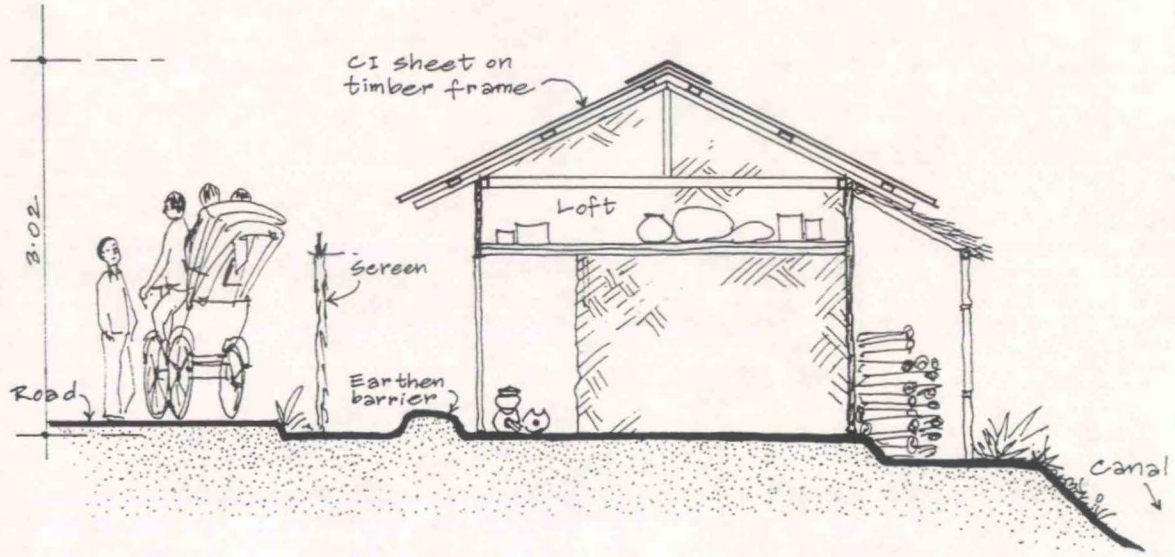
SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
14	JBP-LGED	Bhola	Kajol Mia	1994



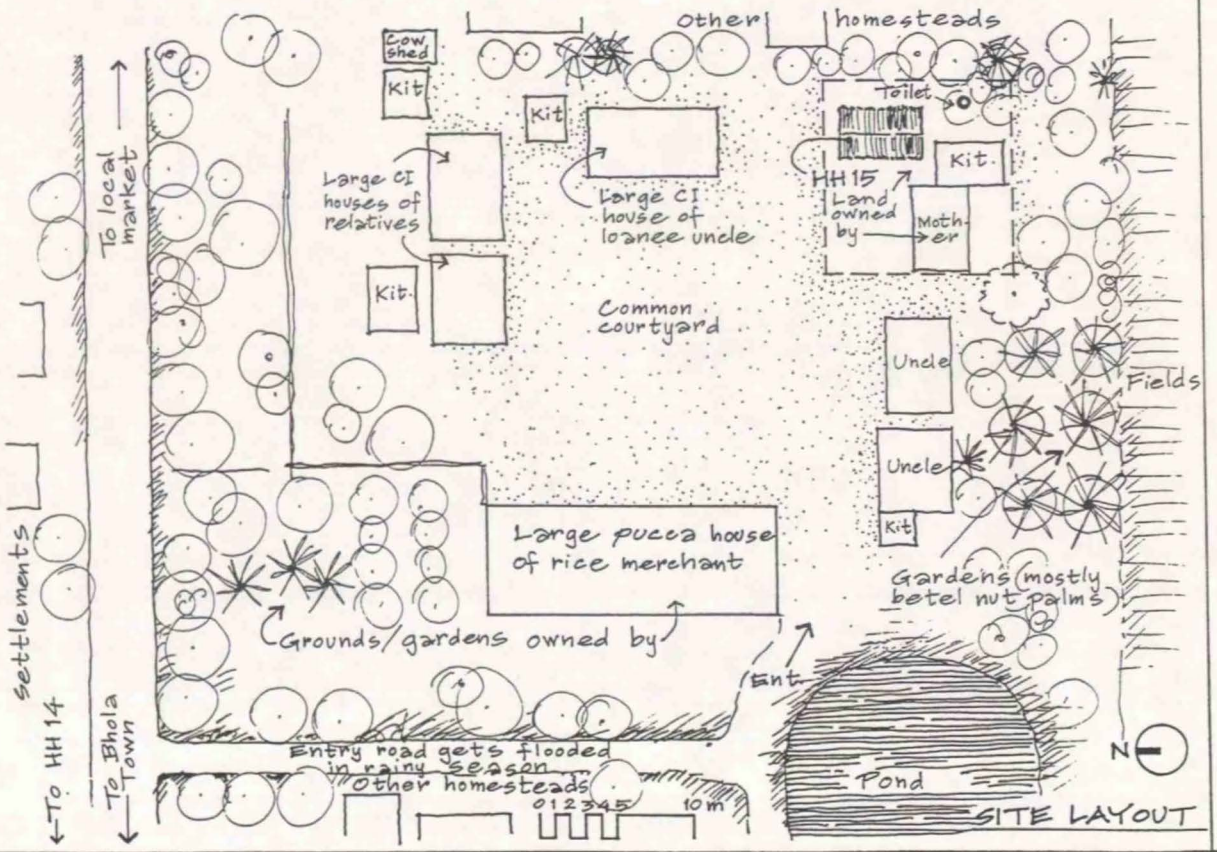
PLAN

0 0·5 1·0 2·0 3·0 m



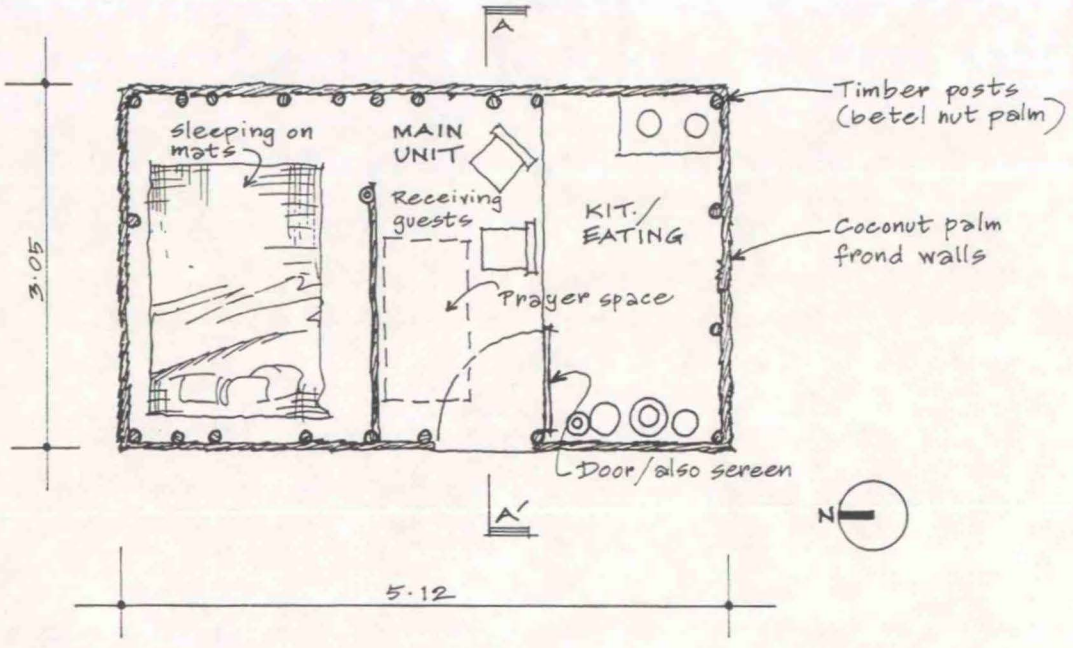
SECTION AA'

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
14	JBP-LGED	Bhola	Kajol Mia	1994

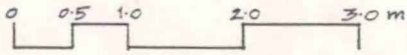


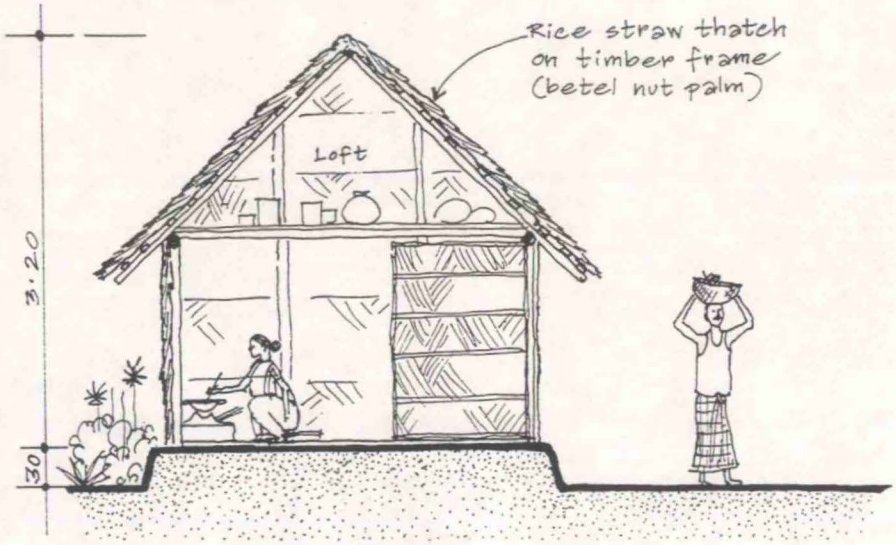
SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
15	None	Bhola	Jamal Alam	1990



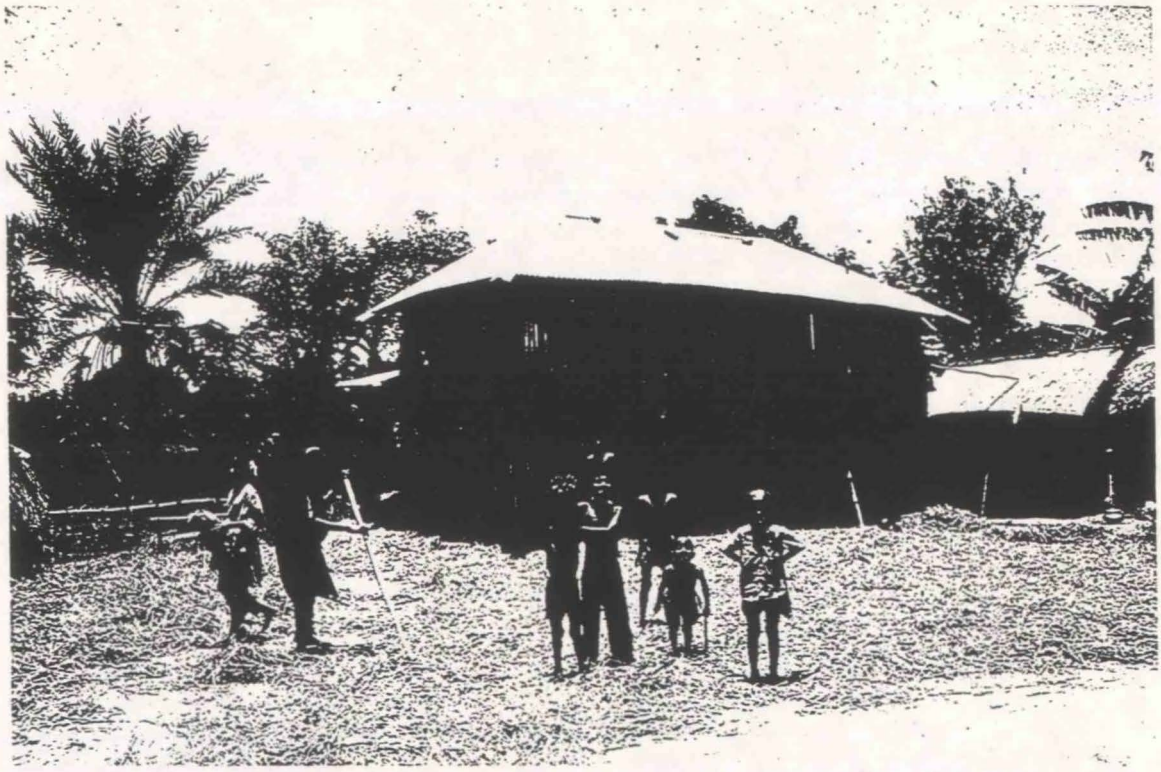
PLAN

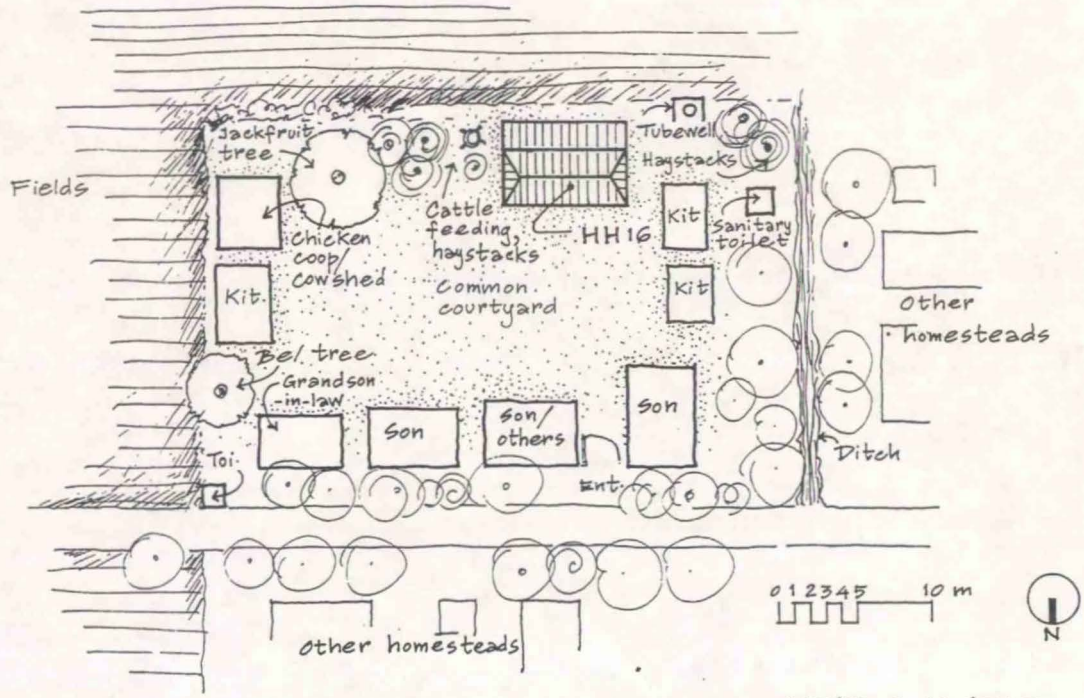




SECTION AA'

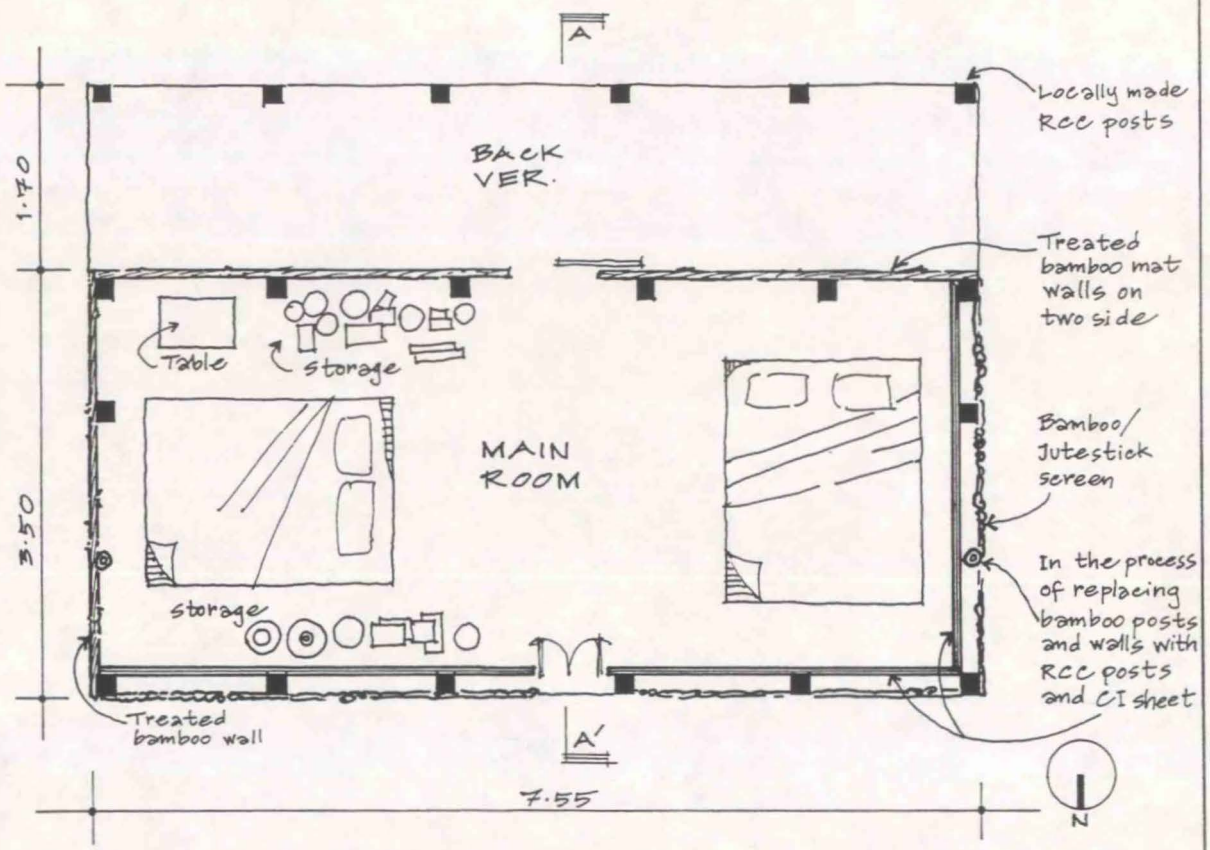
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
15	None	Bhola	Jamal Alam	1990



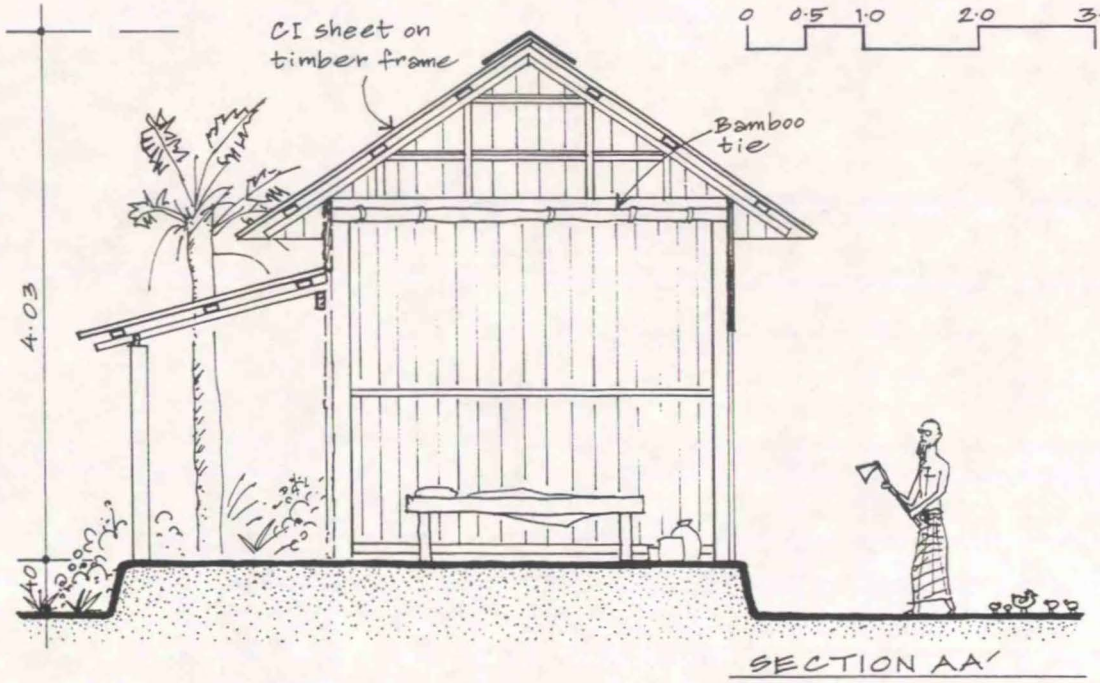


SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
16	Proshika/bamboo treatmnt.	Dhamrai	Rashid Ali	1987

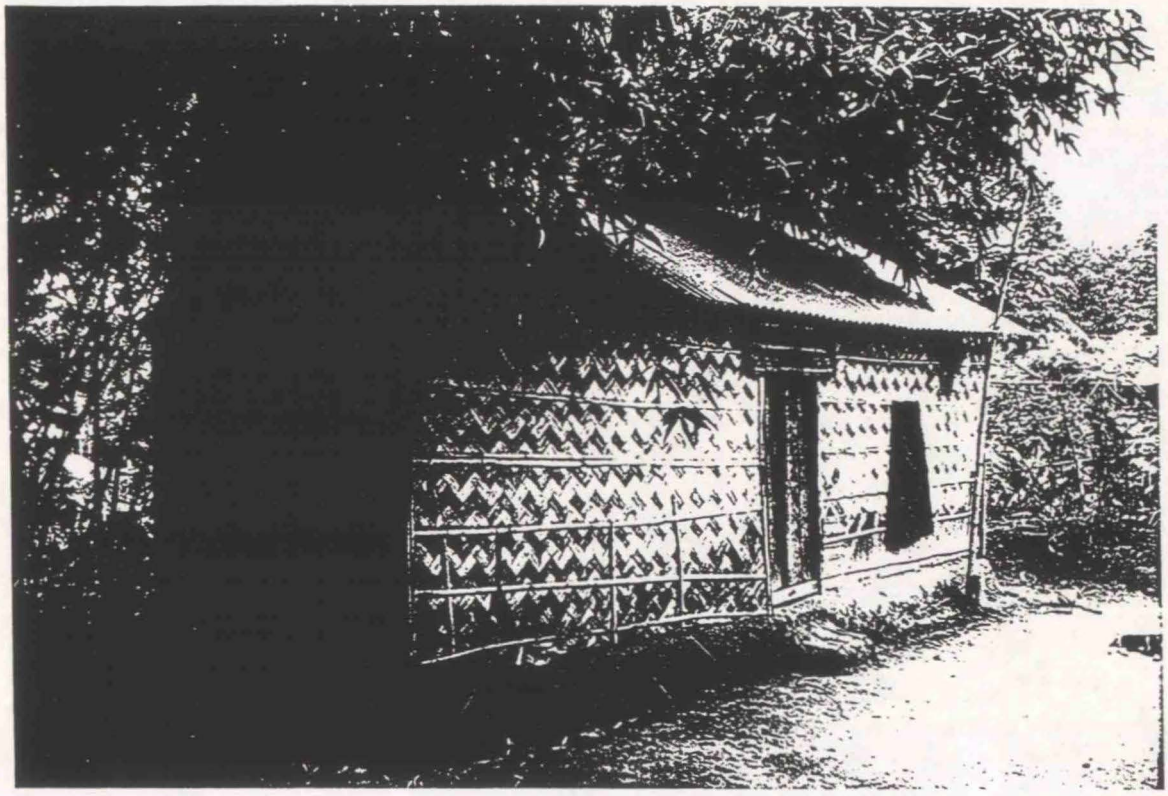


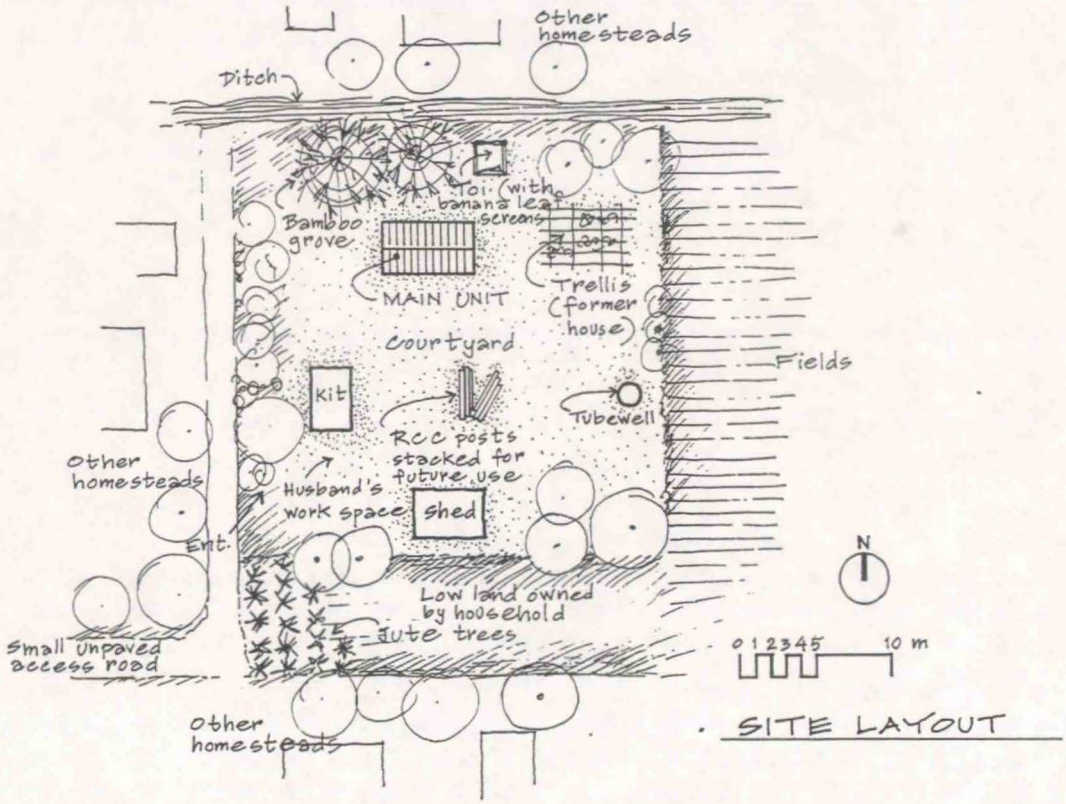
PLAN



SECTION AA'

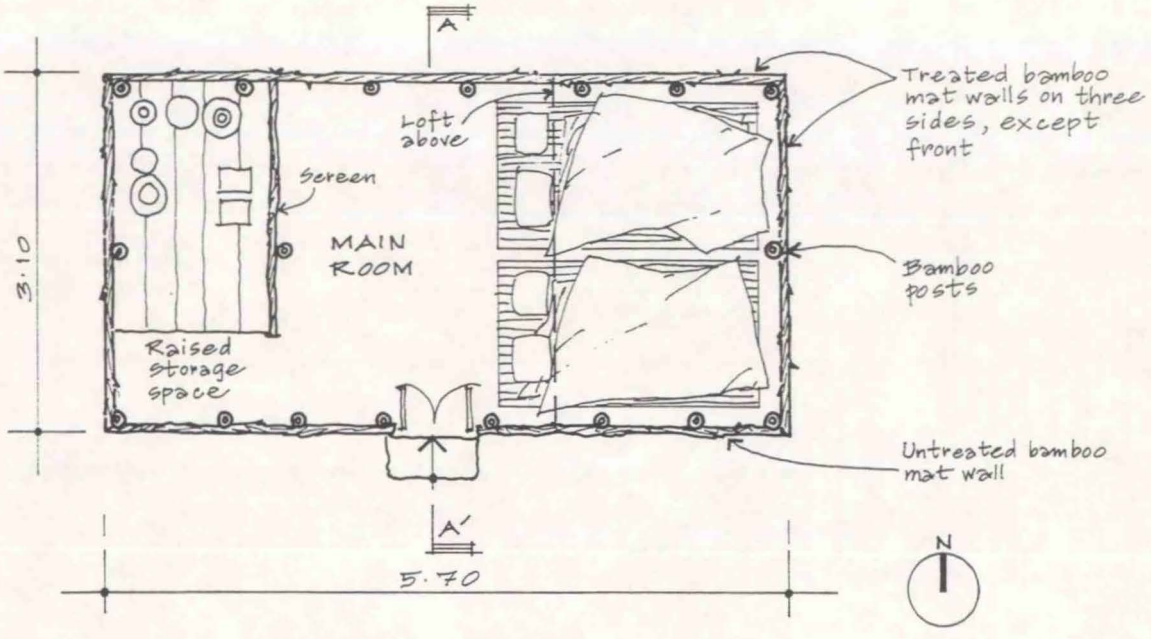
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
16	Proshika/bamboo treatmnt.	Dhamrai	Rashid Ali	1987





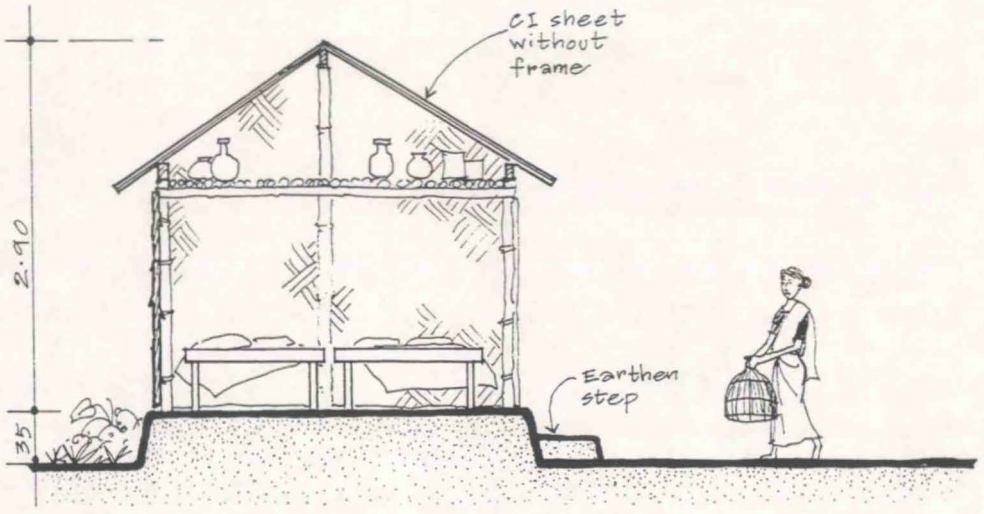
SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
17	Proshika/bamboo treatmnt.	Dhamrai	Momota Begum	1977



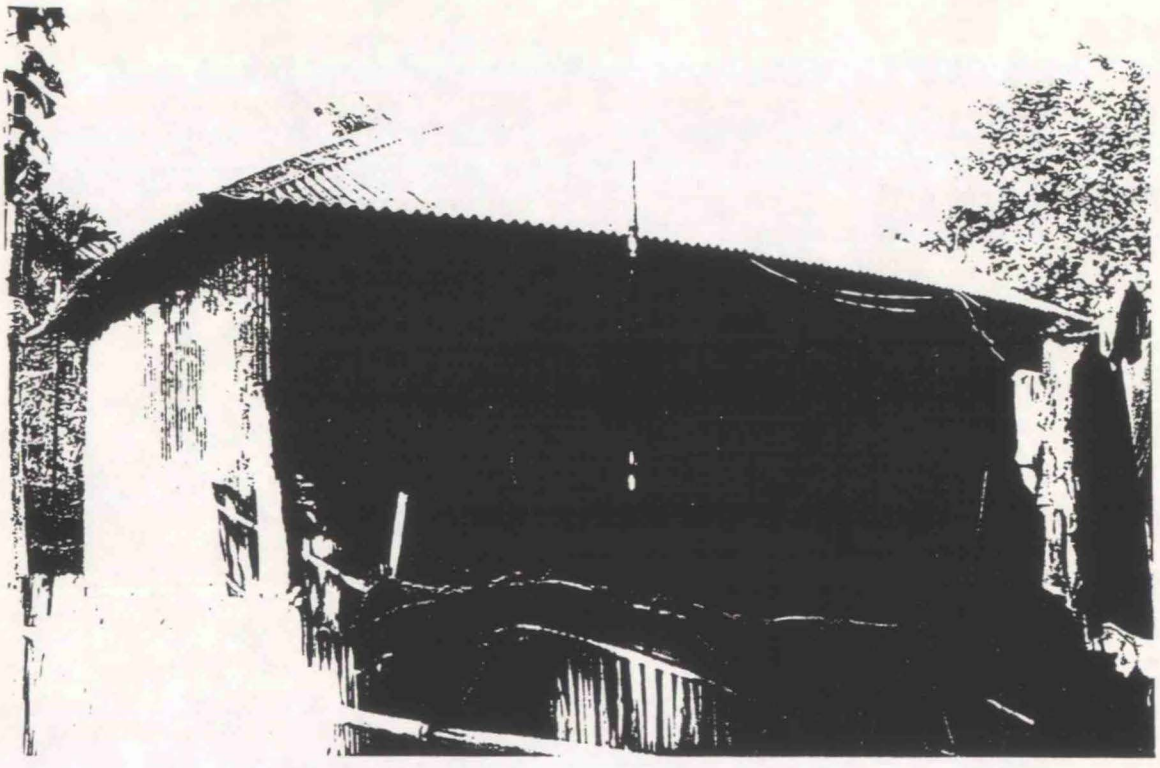
PLAN

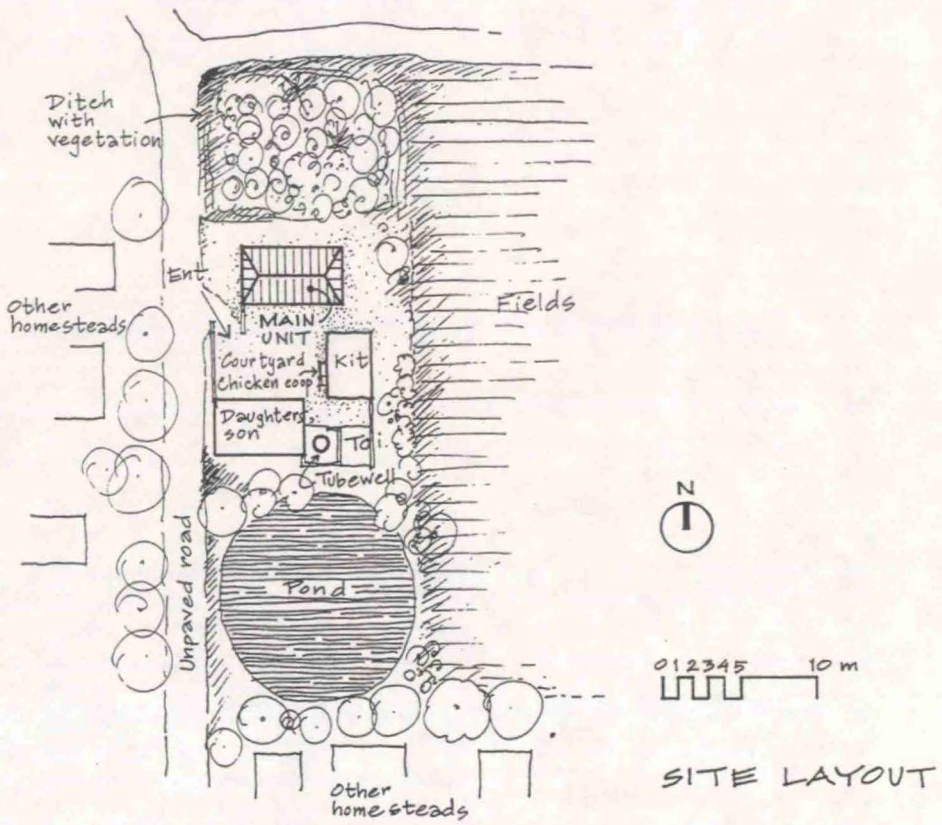
0 0.5 1.0 2.0 3.0 m



SECTION AA'

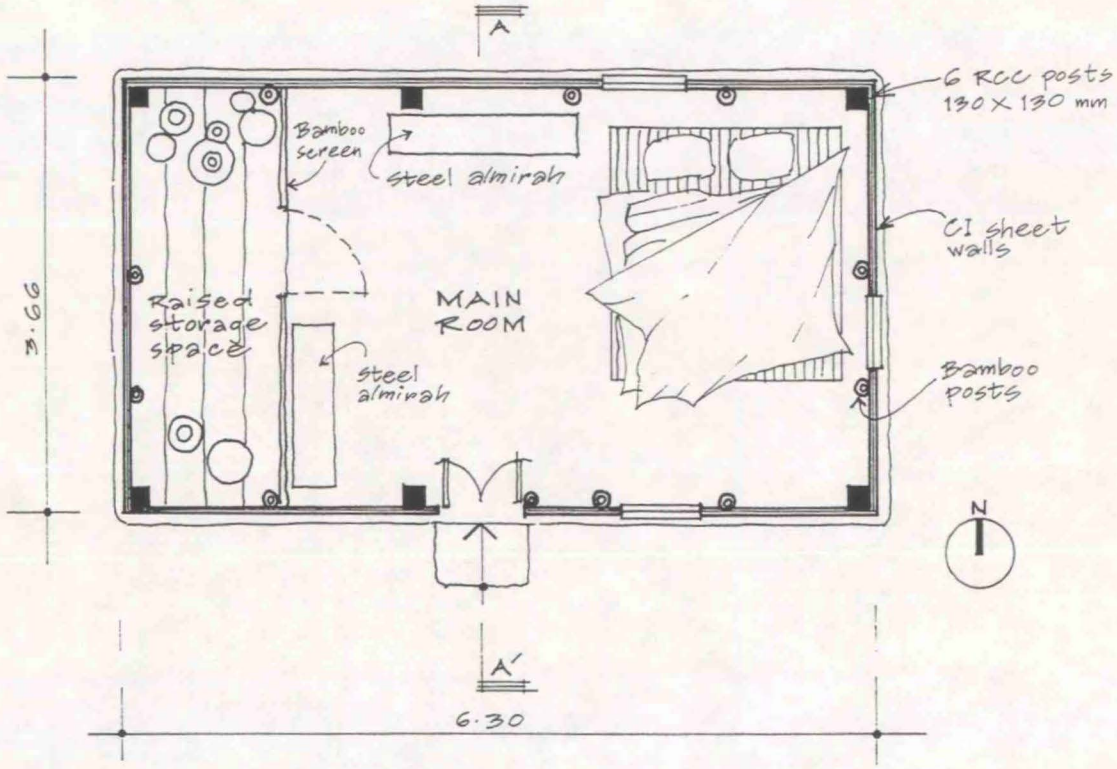
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
17	Proshika/bamboo treatmnt.	Dhamrai	Momota Begum	1977





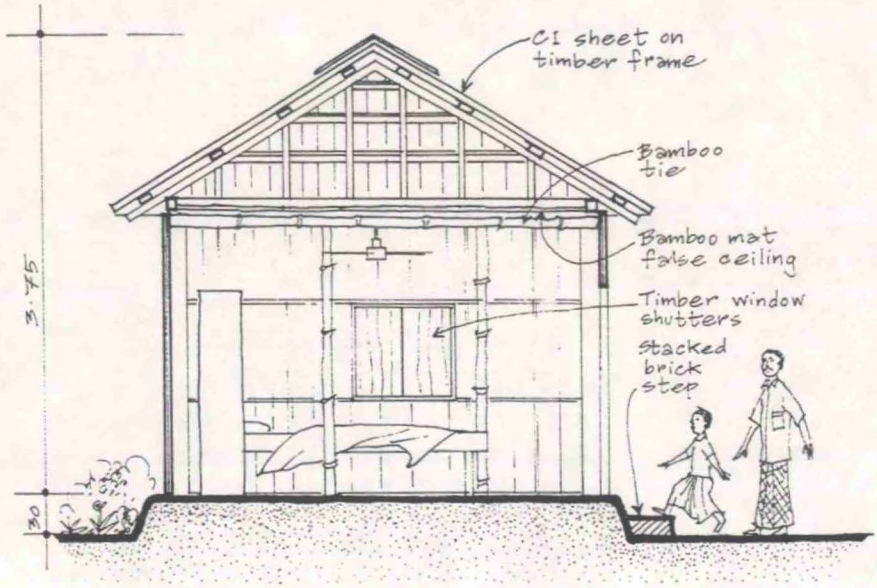
SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
18	Proshika	Dhamrai	Lokman Mia	1992



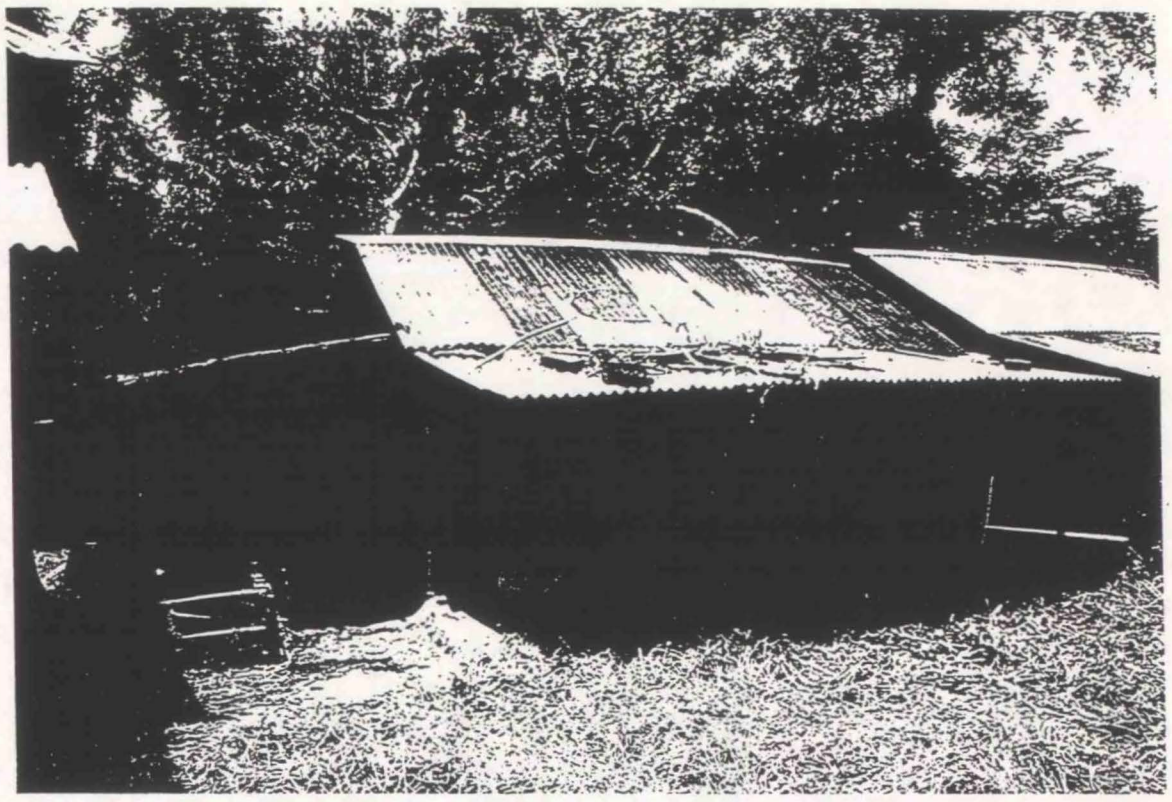
PLAN

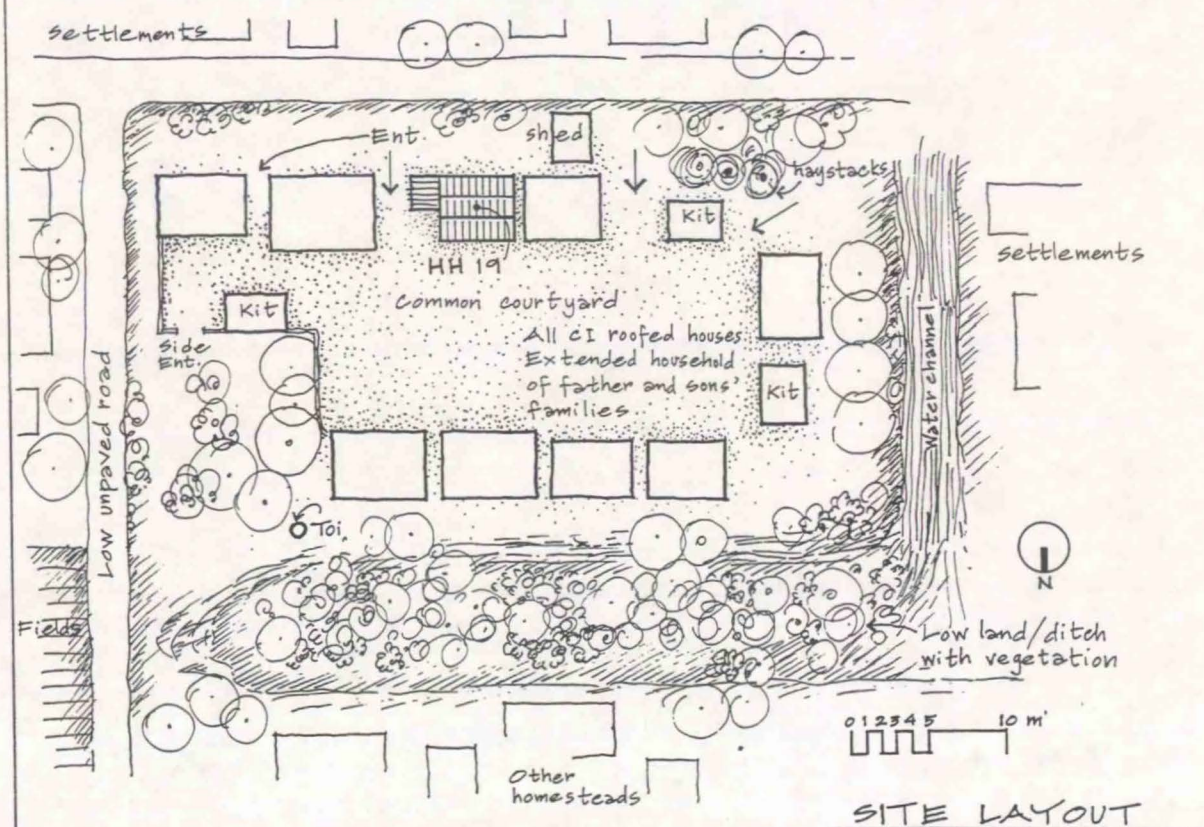
0 0.5 1.0 2.0 3.0 m



SECTION AA'

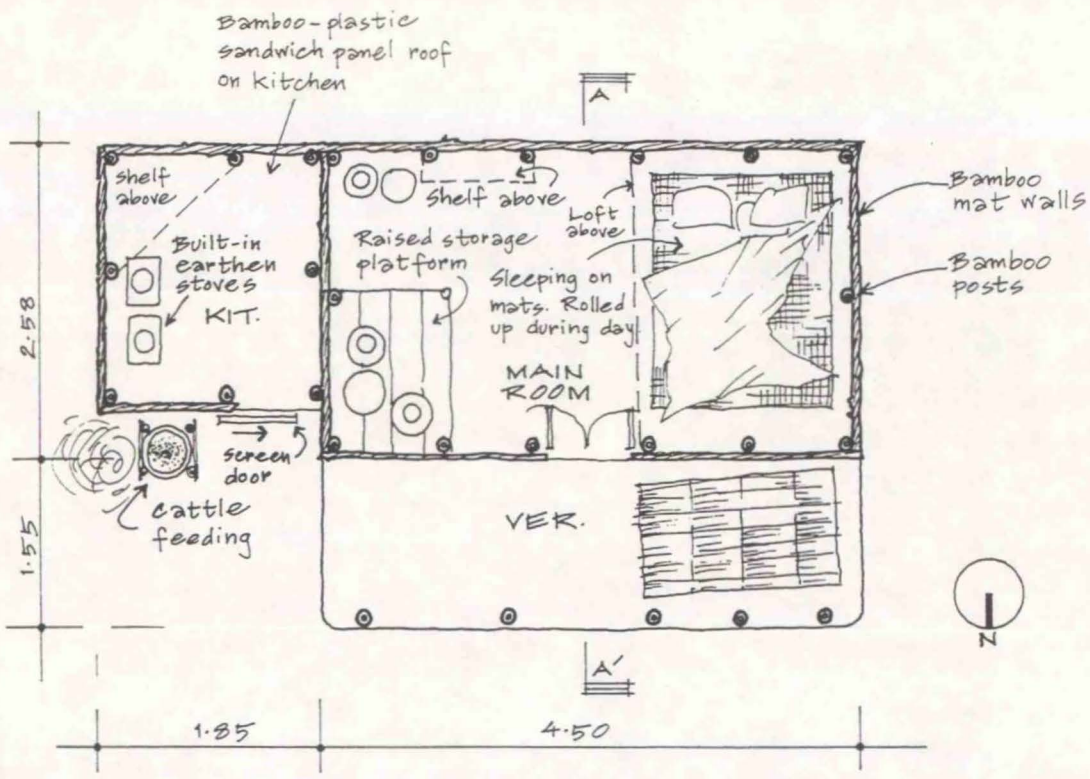
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
18	Proshika	Dhamrai	Lokman Mia	1992





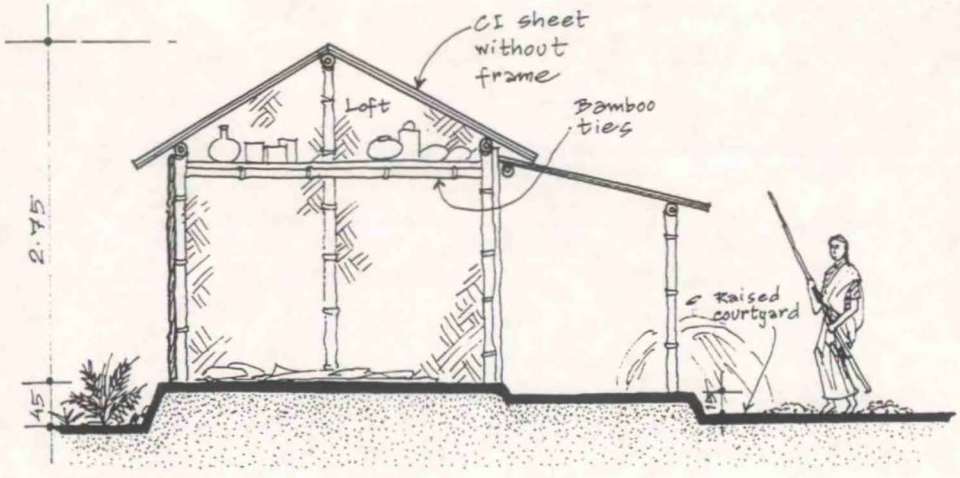
SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
19	None	Dhamrai	Koruna Rani Shutradhar	1994



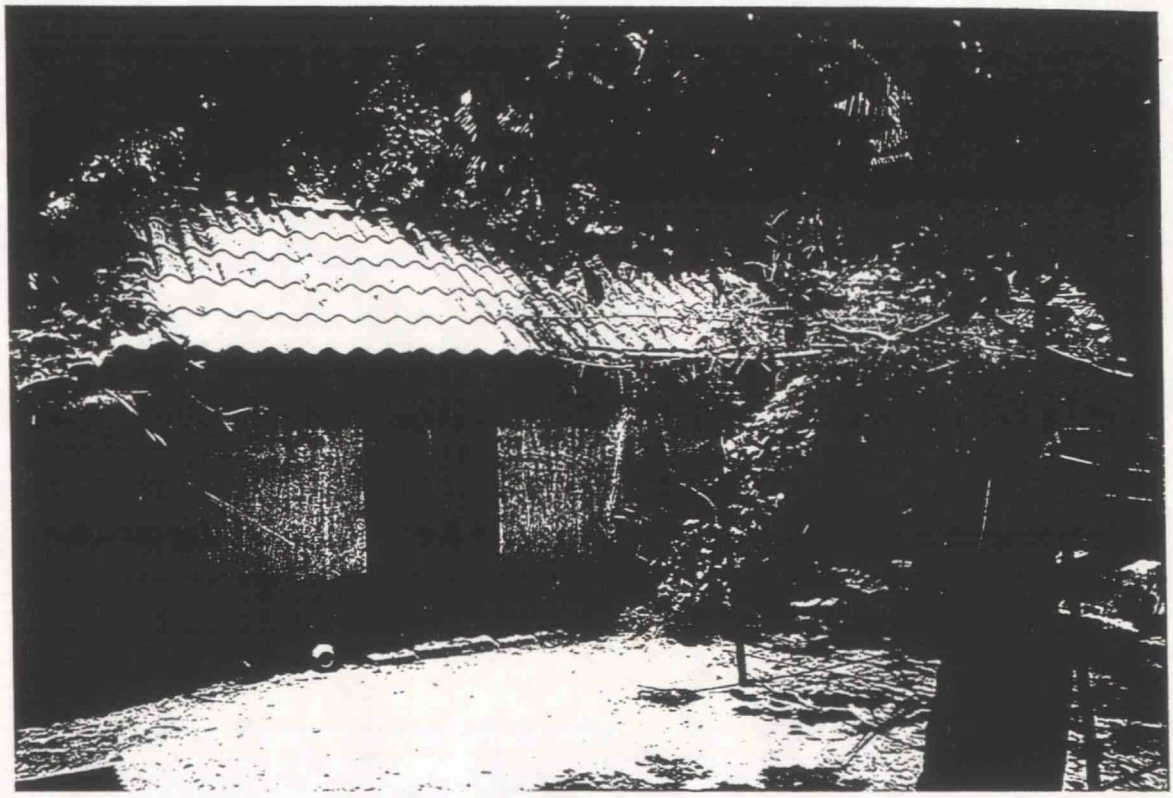
PLAN

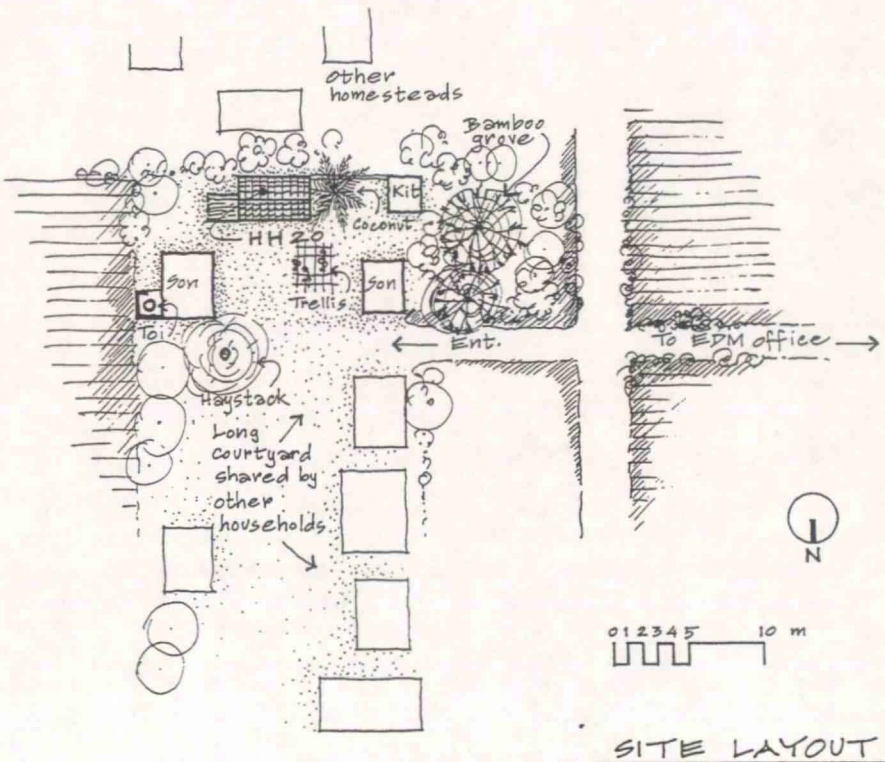
0 0.5 1.0 2.0 3.0 m



SECTION AA'

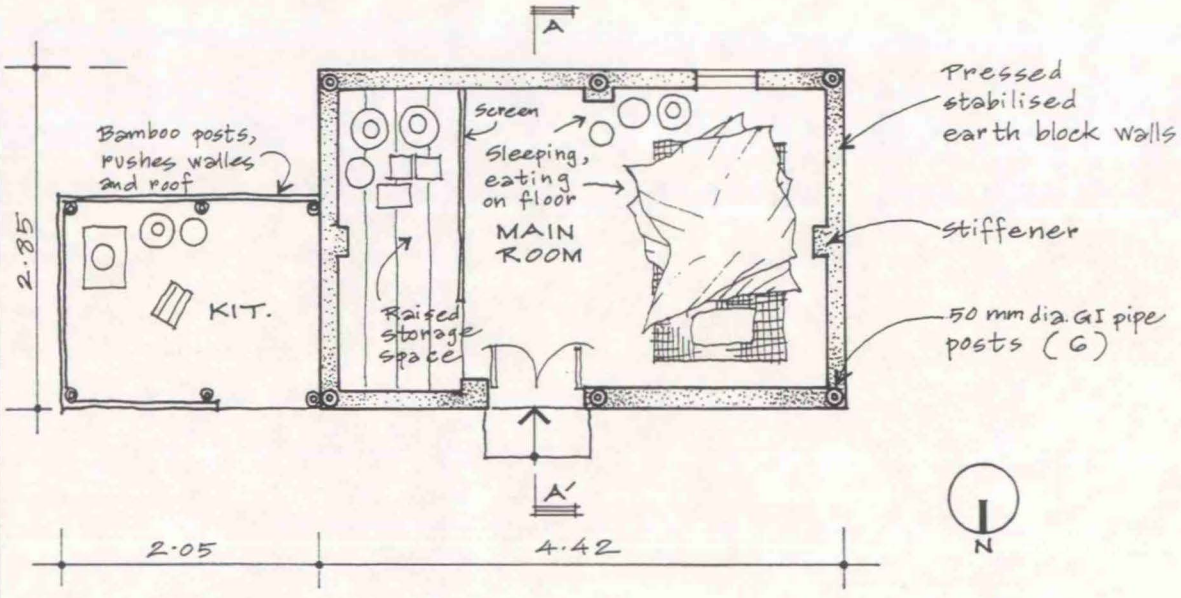
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
19	None	Dhamrai	Koruna Rani Shutradhar	1994





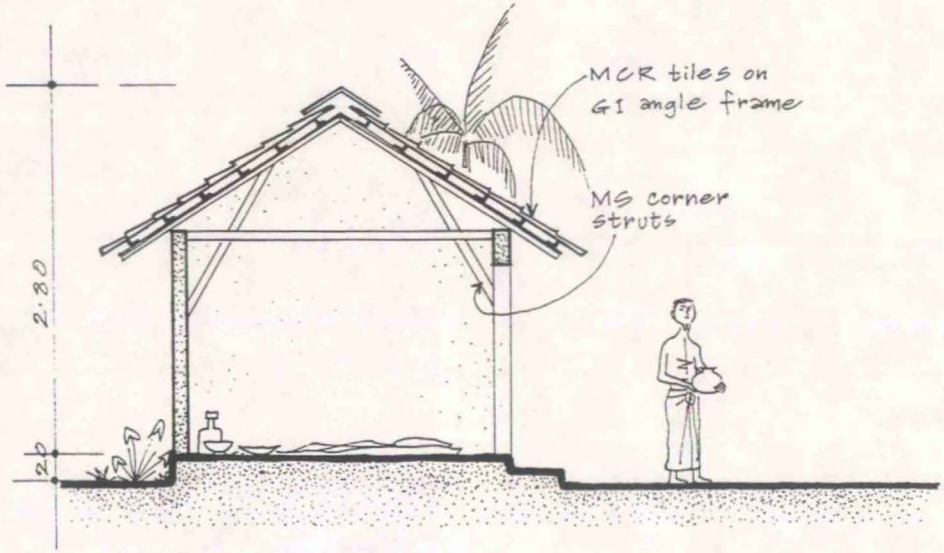
SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
20	EDM	Saturia	Ehsan Ali	1993



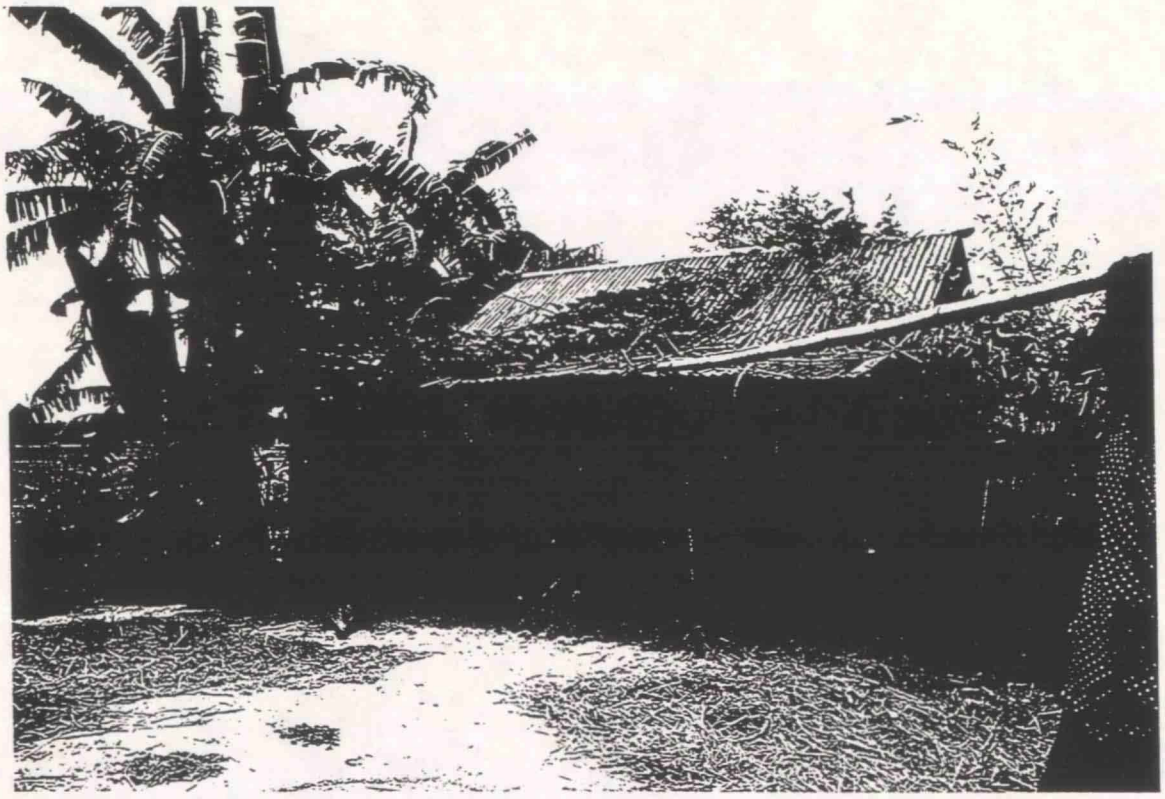
PLAN

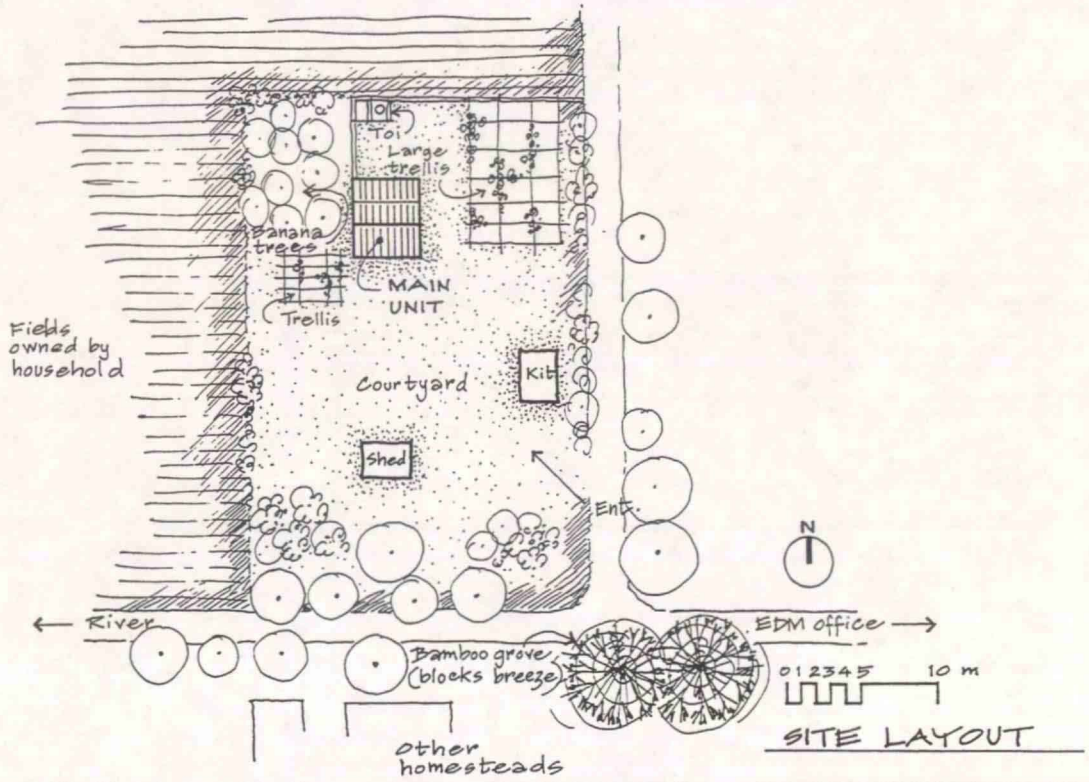
0 0.5 1.0 2.0 3.0 m



SECTION AA'

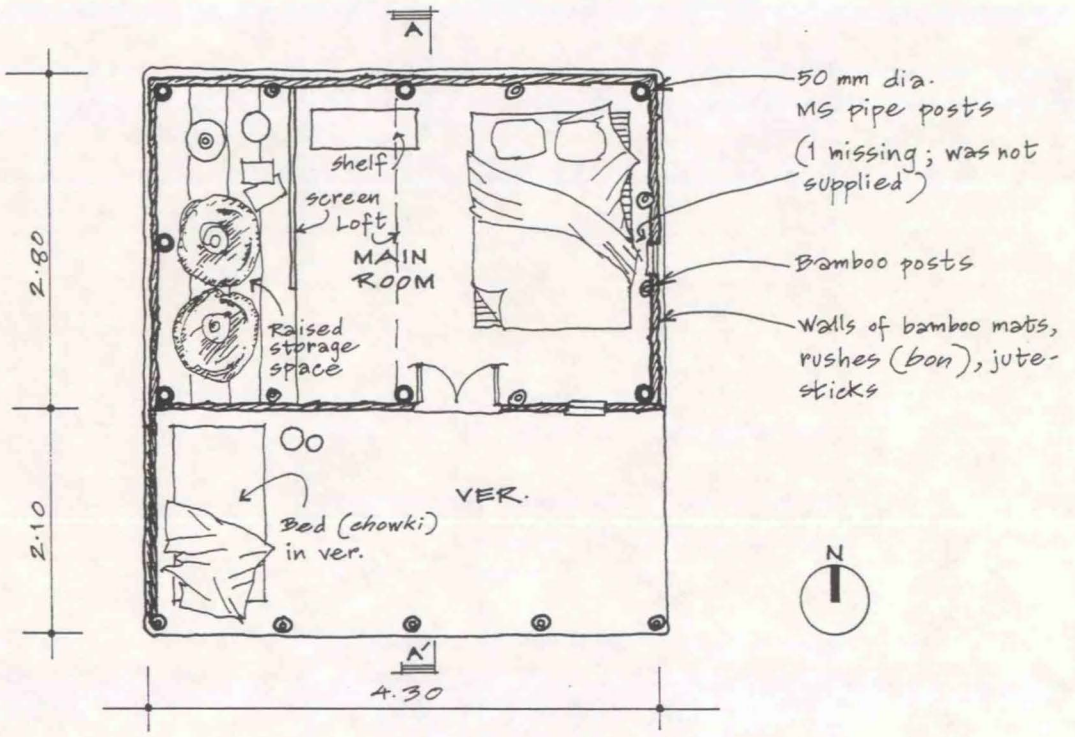
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
20	EDM	Saturia	Ehsan Ali	1993





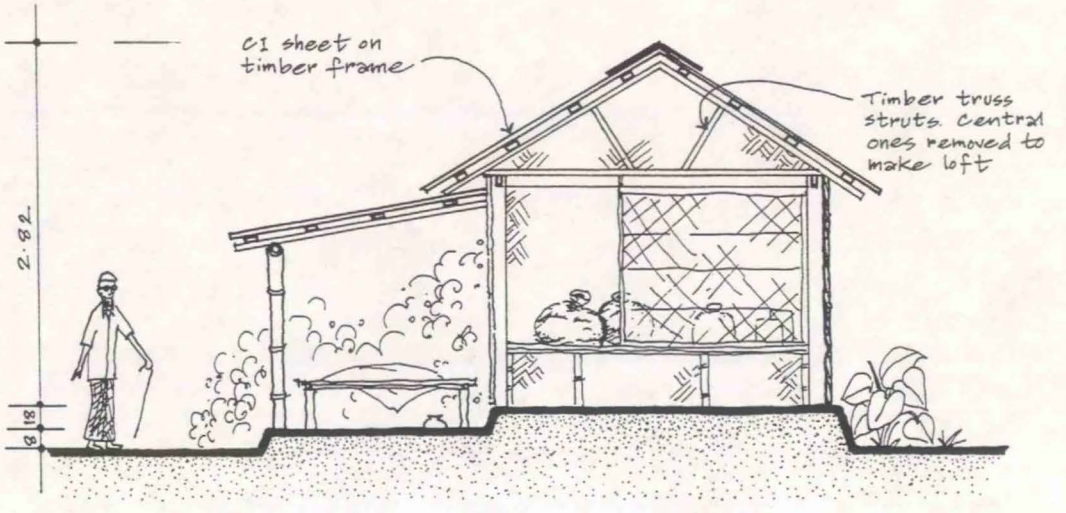
SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
21	EDM	Saturia	Borhan Uddin	1989



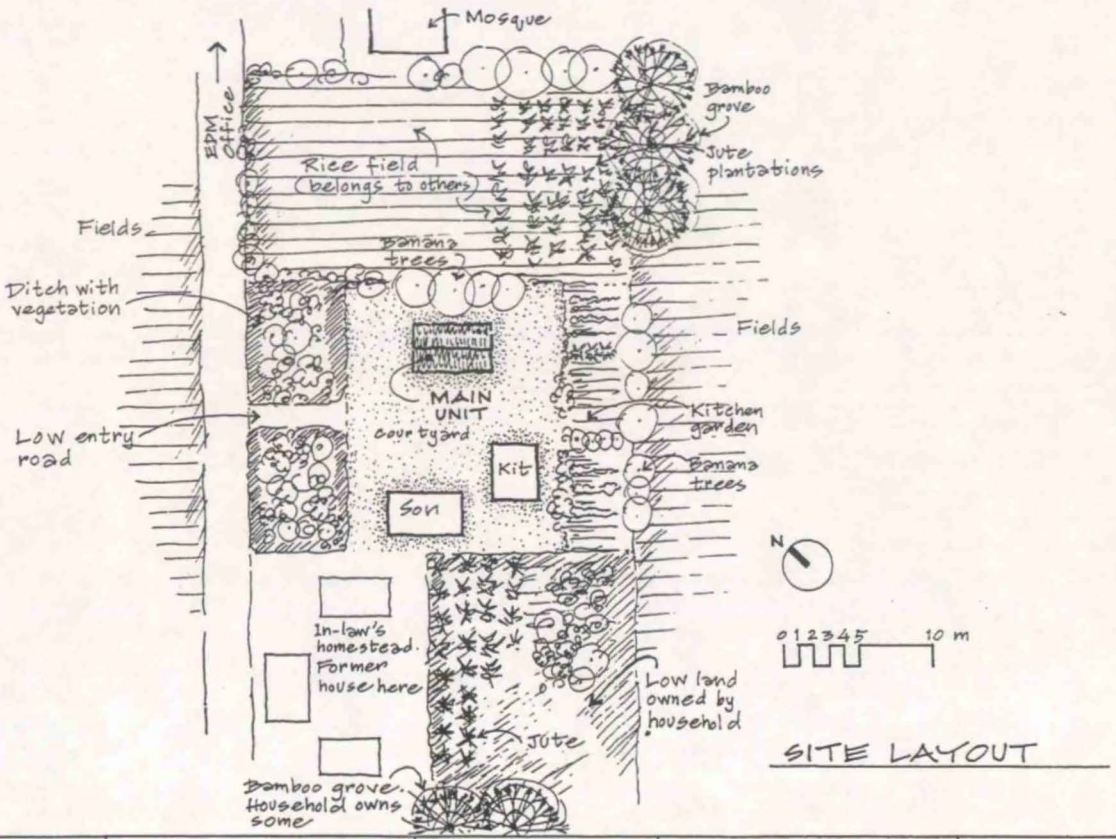
PLAN

0 0.5 1.0 2.0 3.0 m



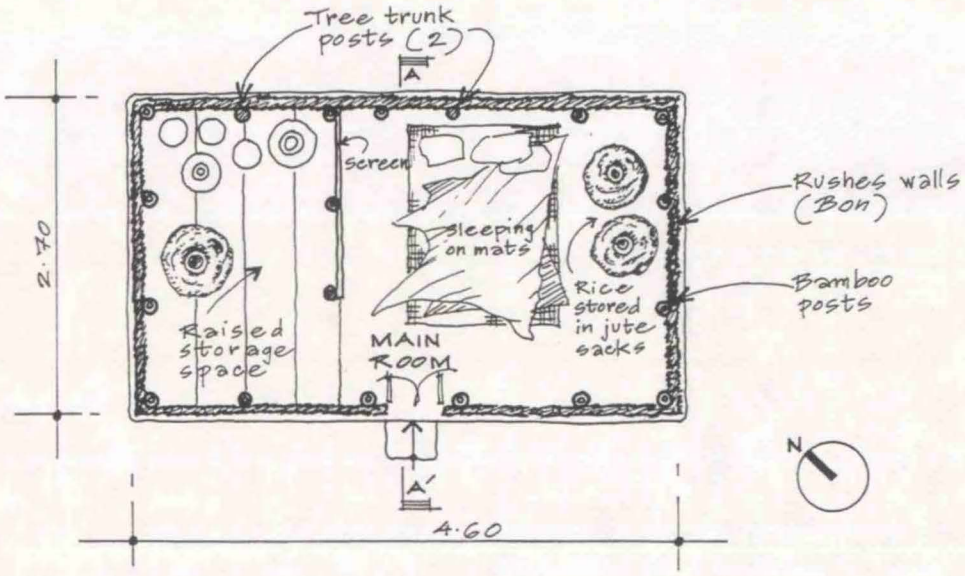
SECTION AA'

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
21	EDM	Saturia	Borhan Uddin	1989

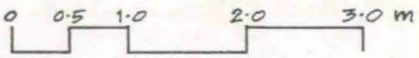


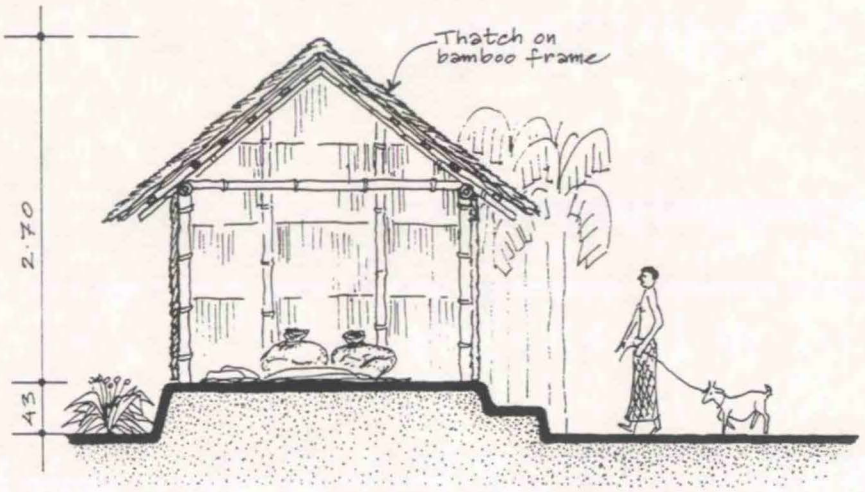
SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
22	EDM/sold off	Saturia	Shahjalal Ali	1989



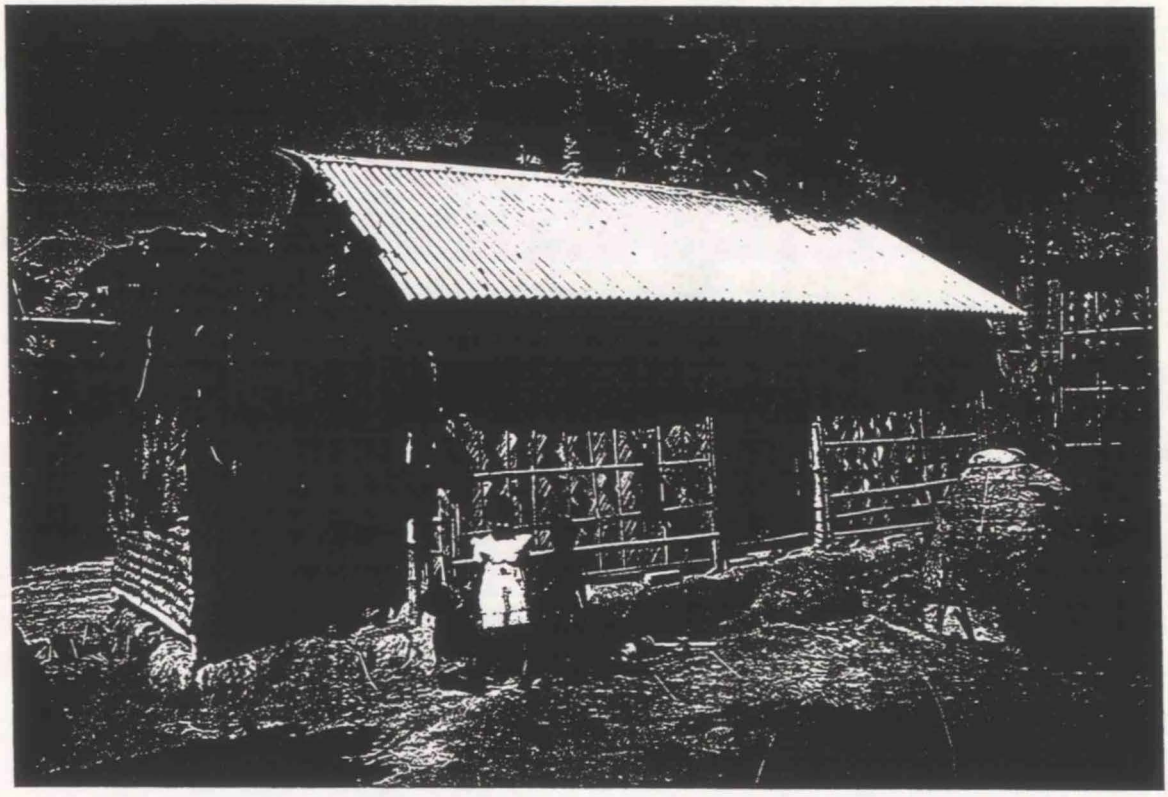
PLAN

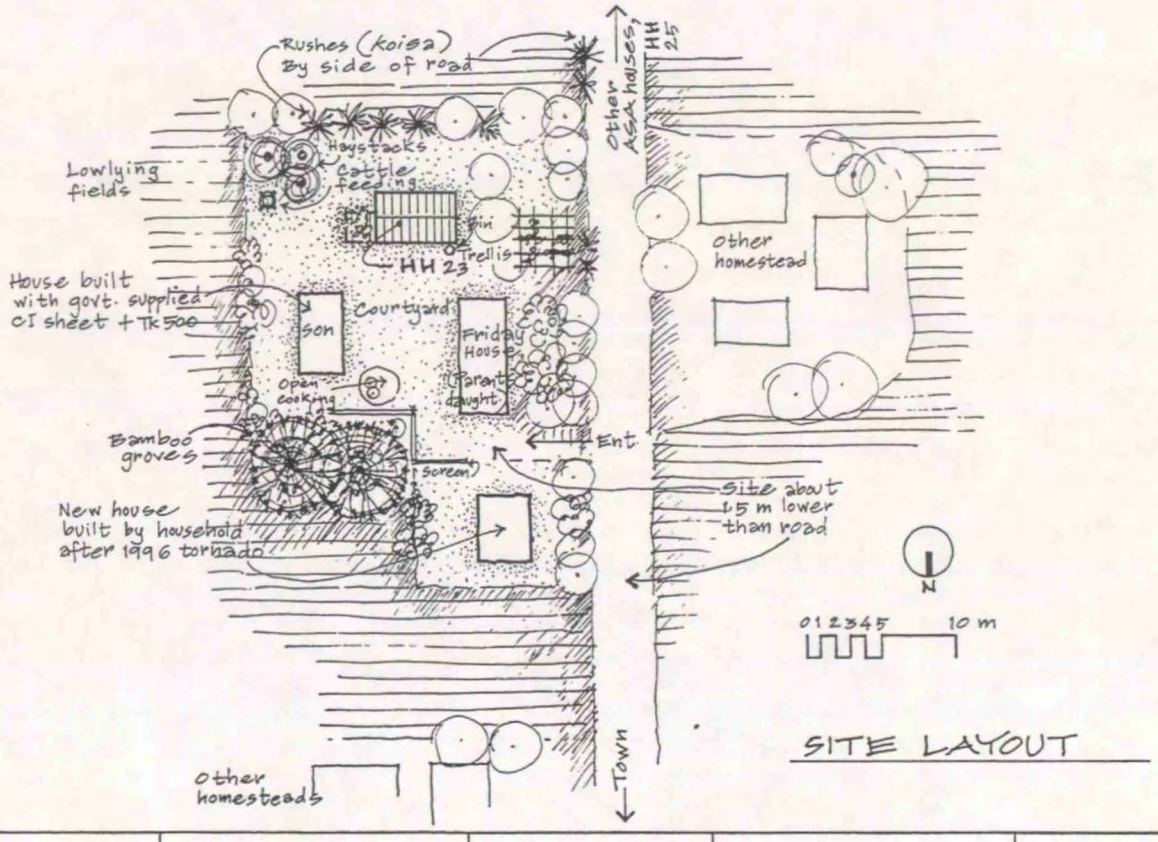




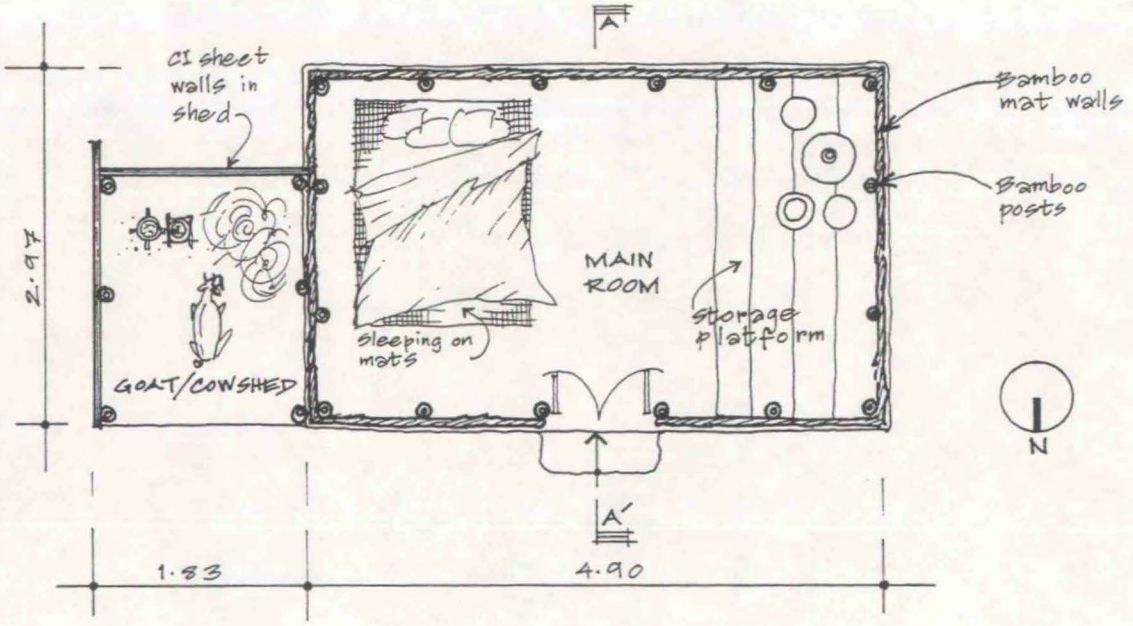
SECTION AA'

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
22	EDM/sold off	Saturia	Shahjalal Ali	1989





HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
23	ASA	Tangail	Nazmul Islam	1996



PLAN

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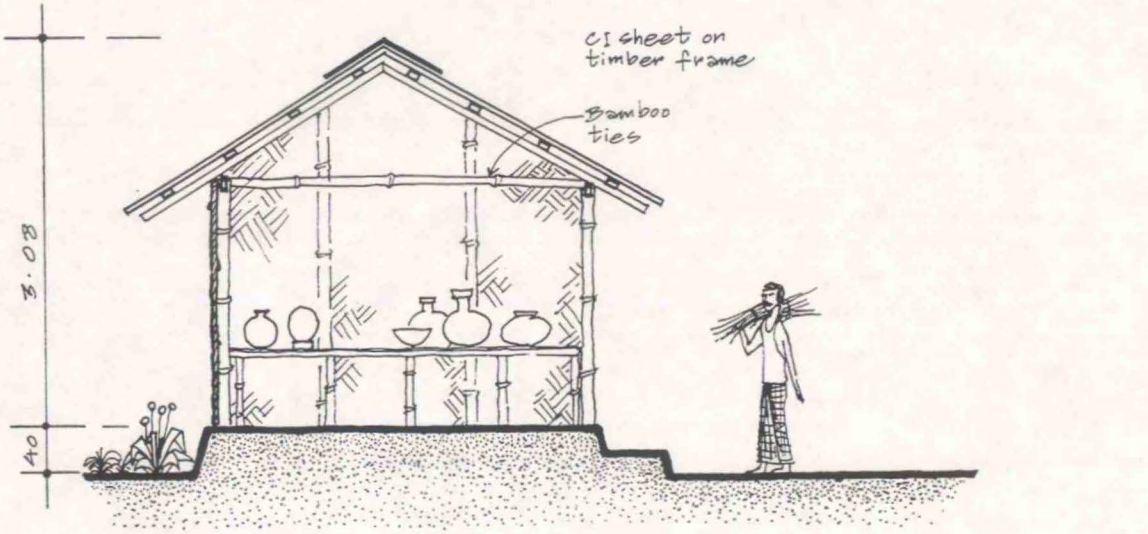
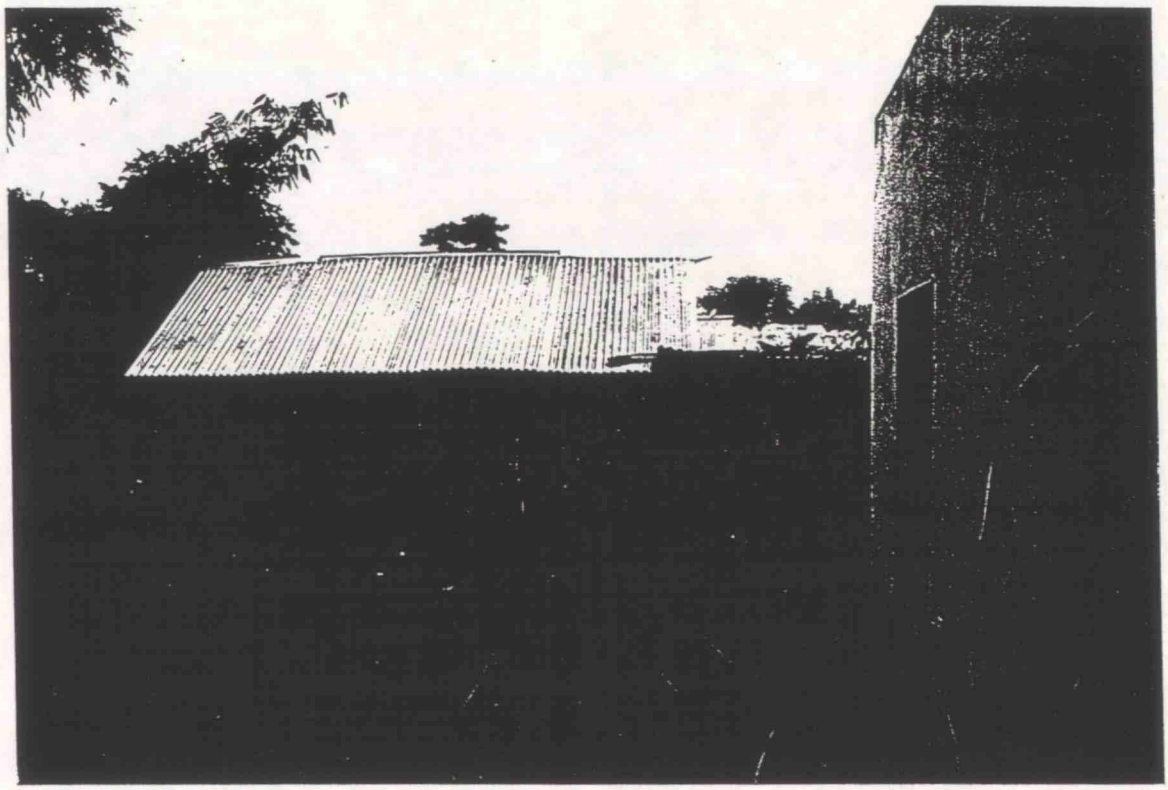
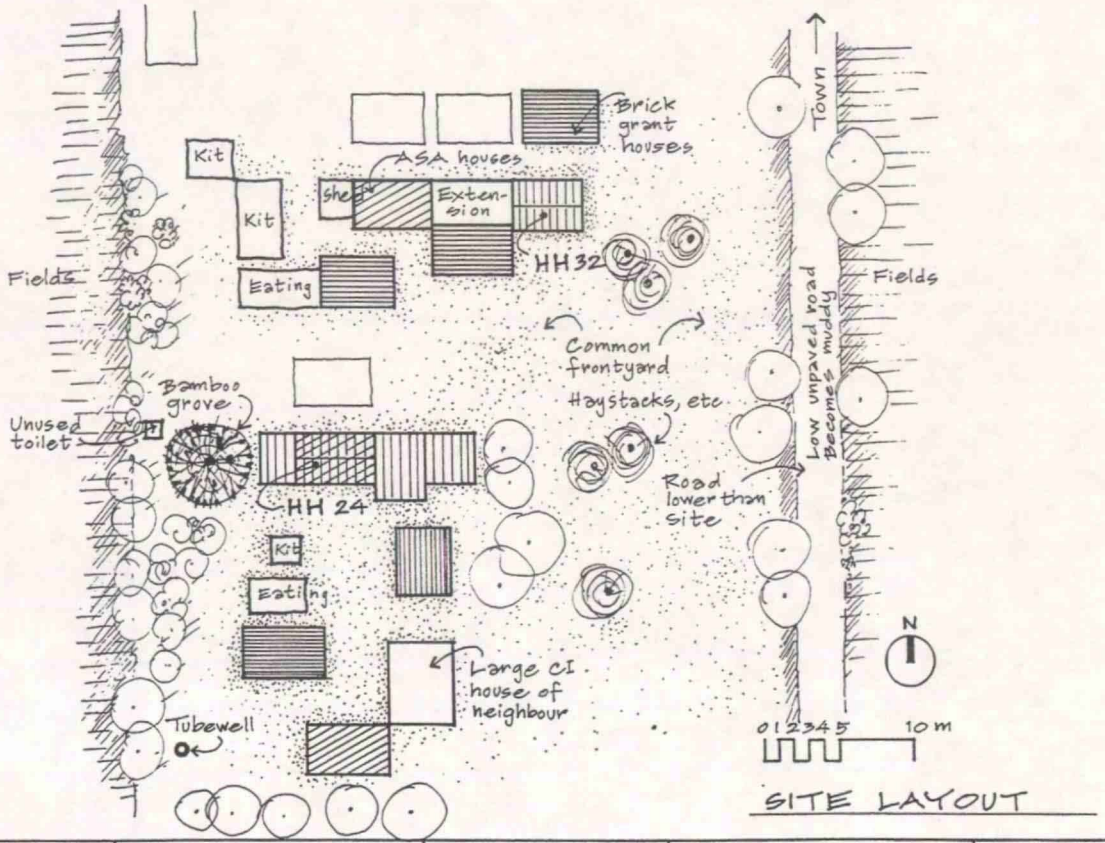


SECTION AA'

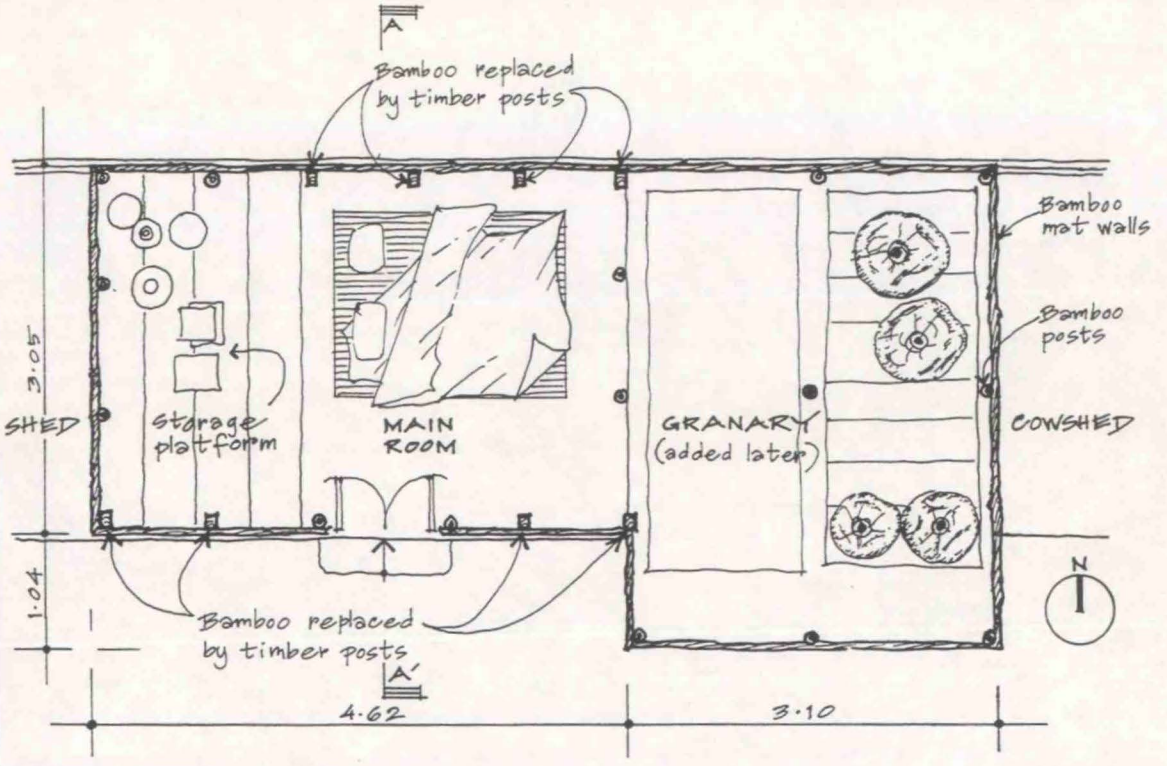
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
23	ASA	Tangail	Nazmul Islam	1996





SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
24	ASA	Tangail	Laila Khatun	1996



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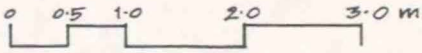
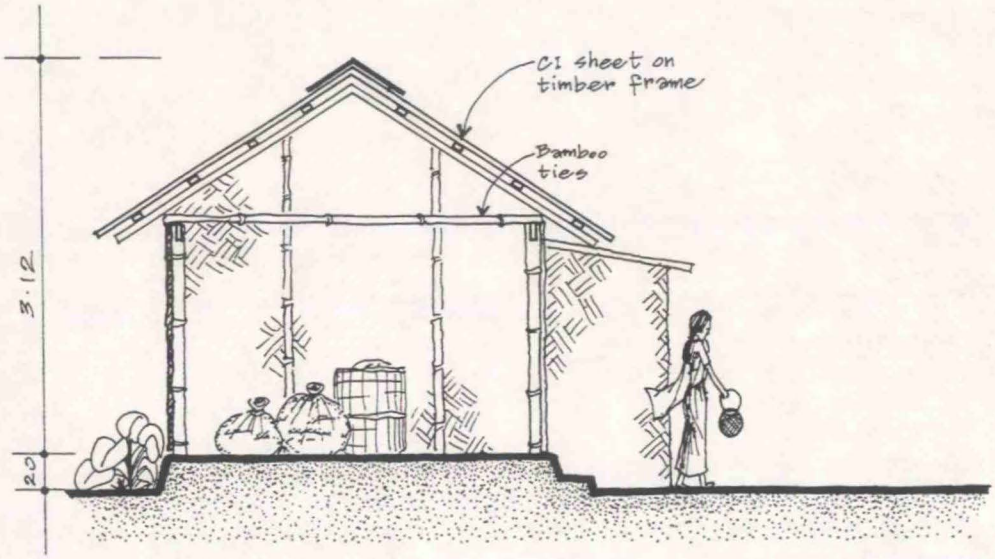
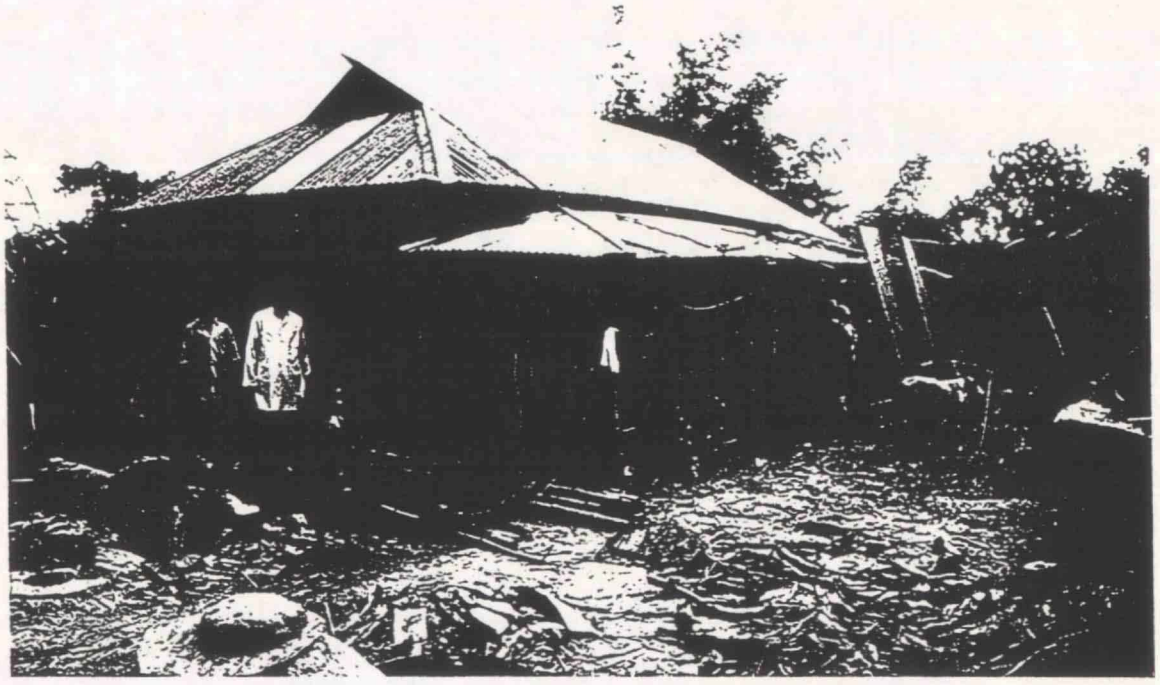
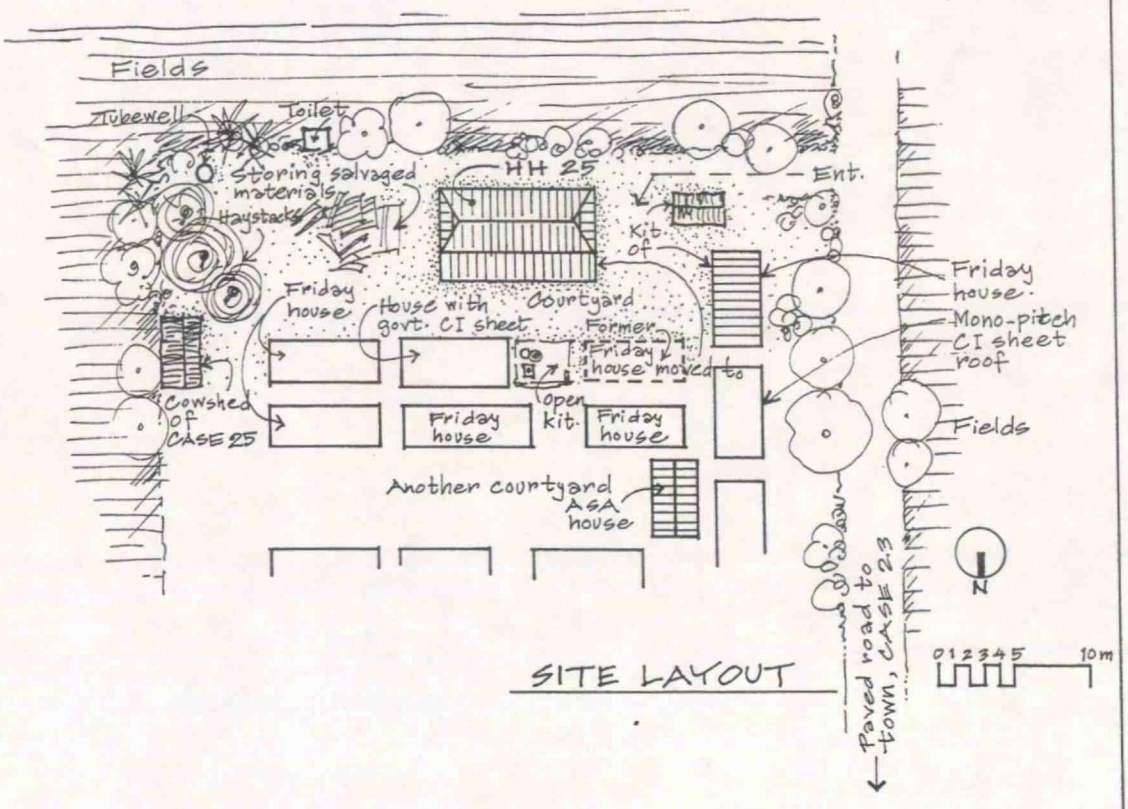




SECTION AA'

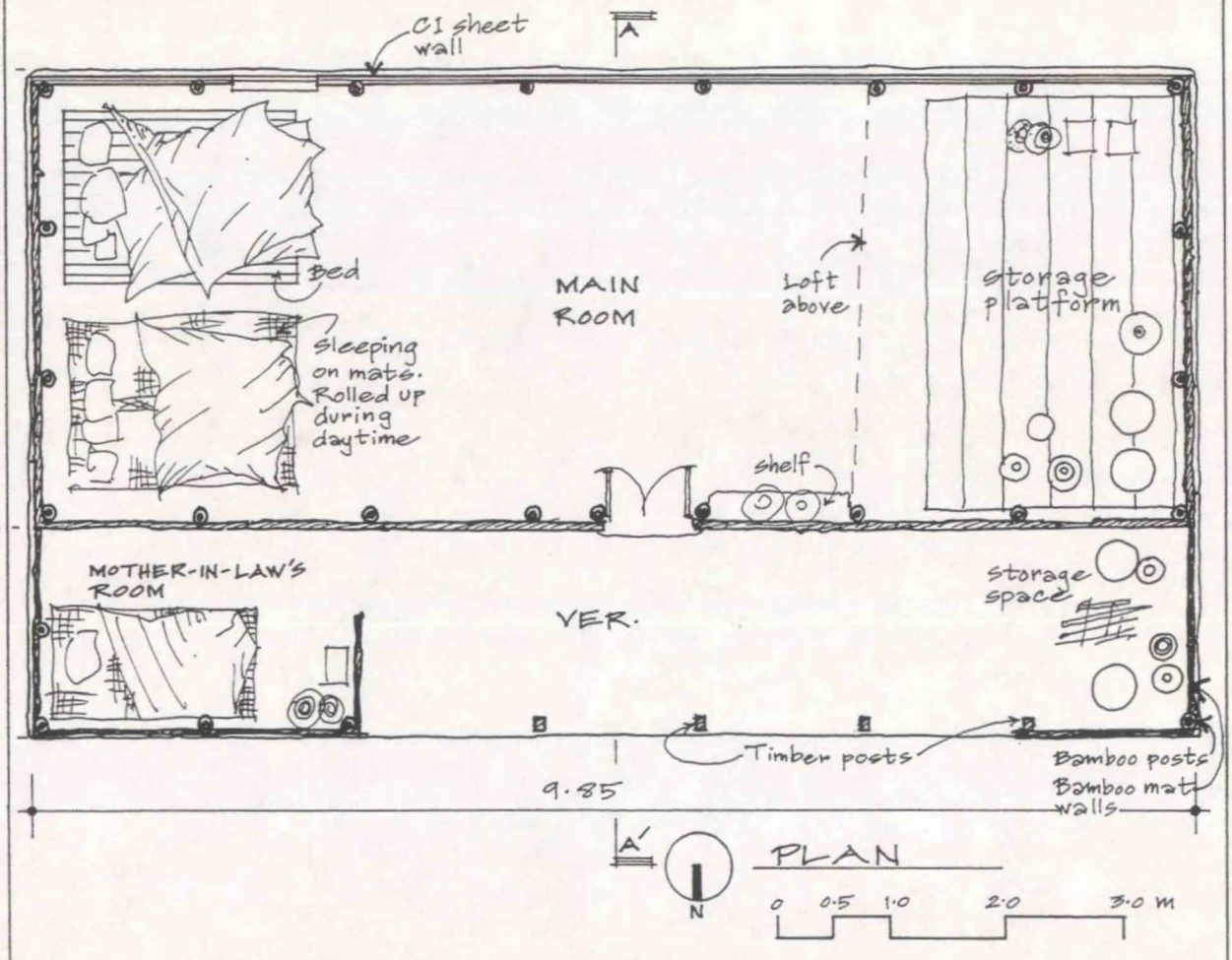
HH	PROGRAMME	LOCATION	RESPONDENT	YR BUILT
24	ASA	Tangail	Laila Khatun	1996

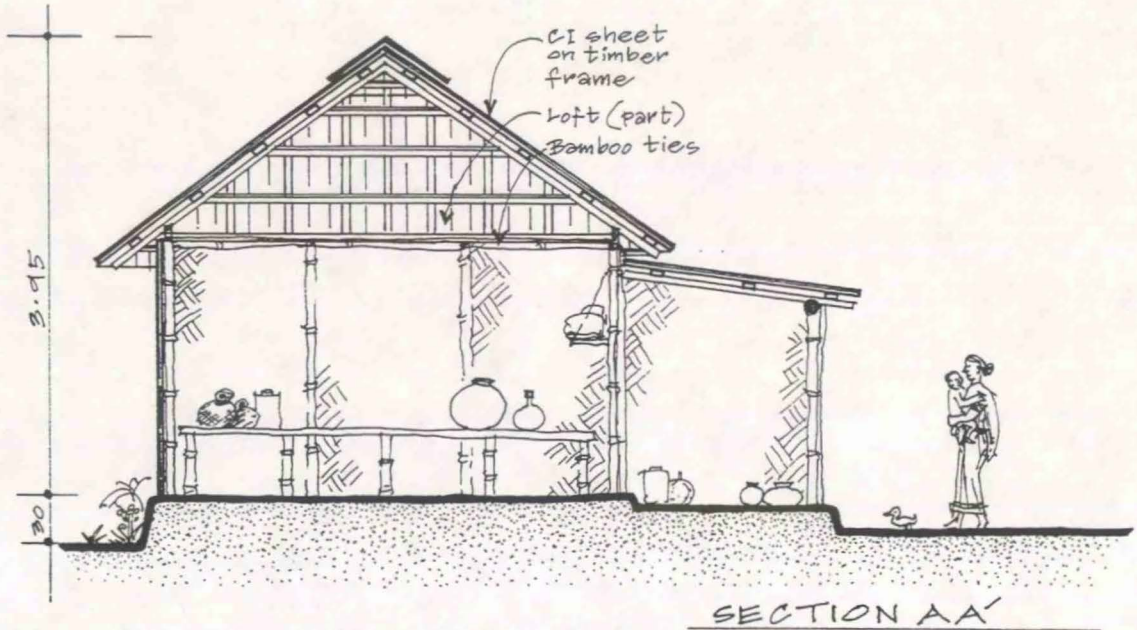




SITE LAYOUT

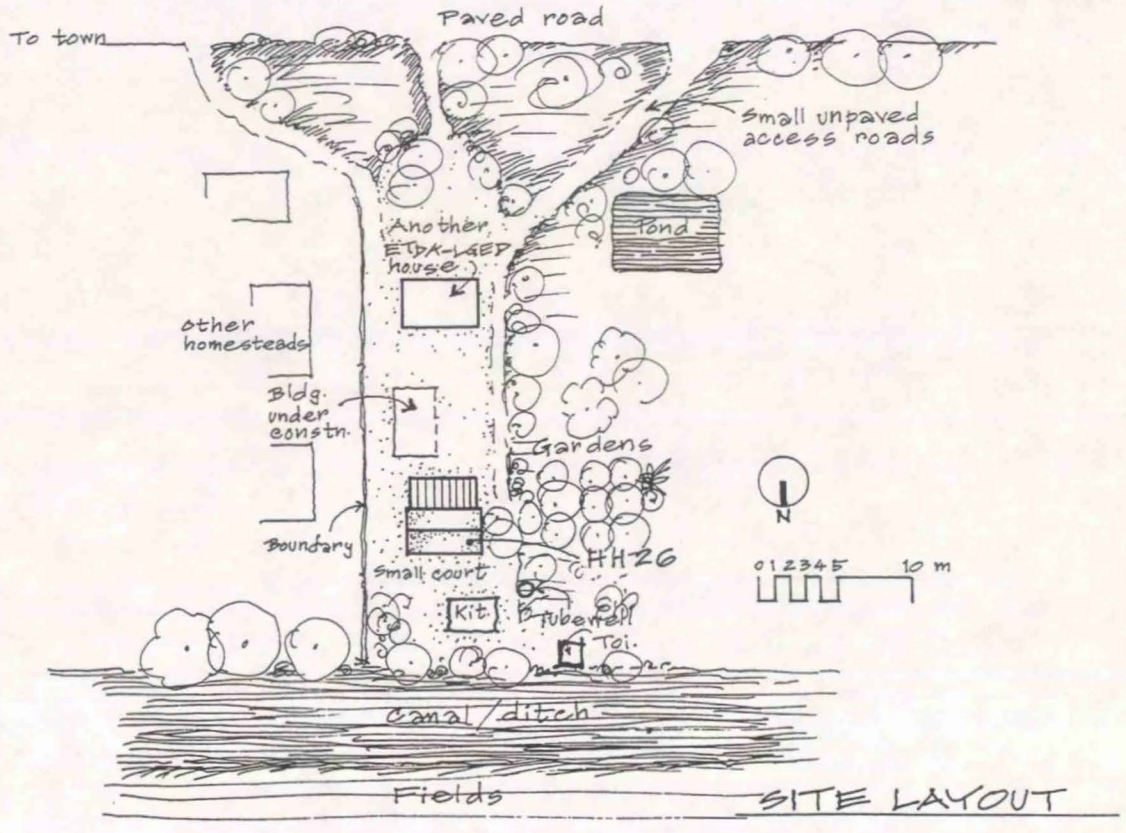
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
25	GB/gen. loan	Tangail	Jahanara Khatun	1997





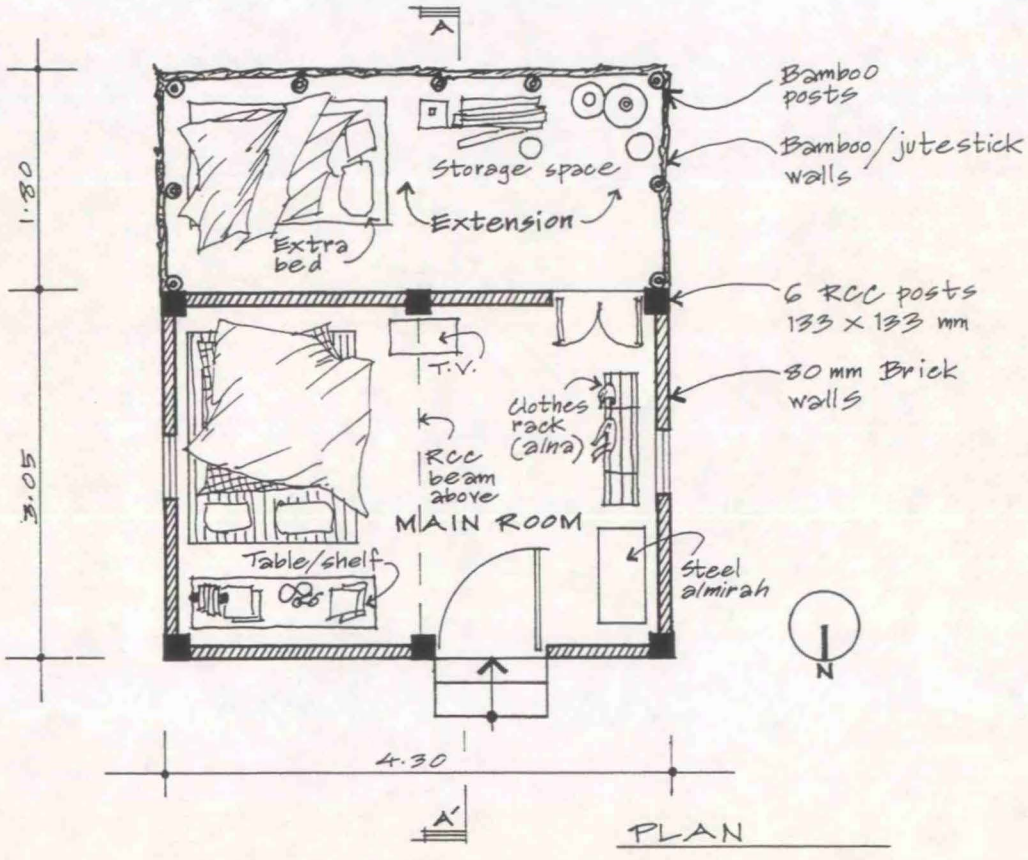
SECTION AA'

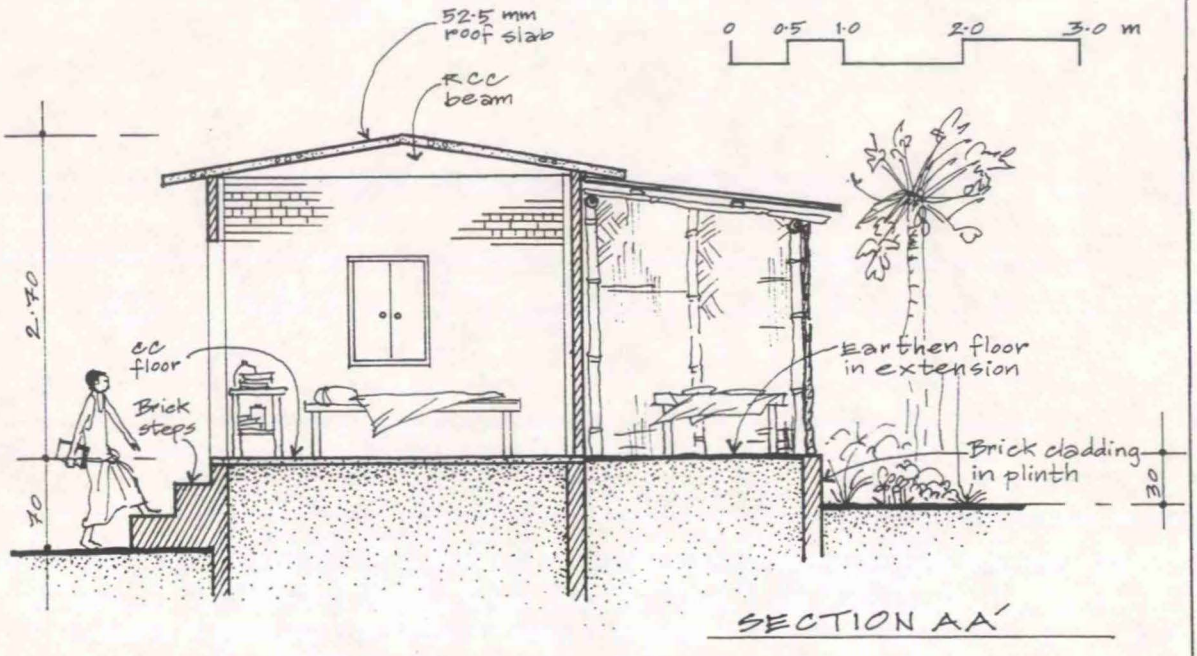
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
25	GB/gen. loan	Tangail	Jahanara Khatun	1997



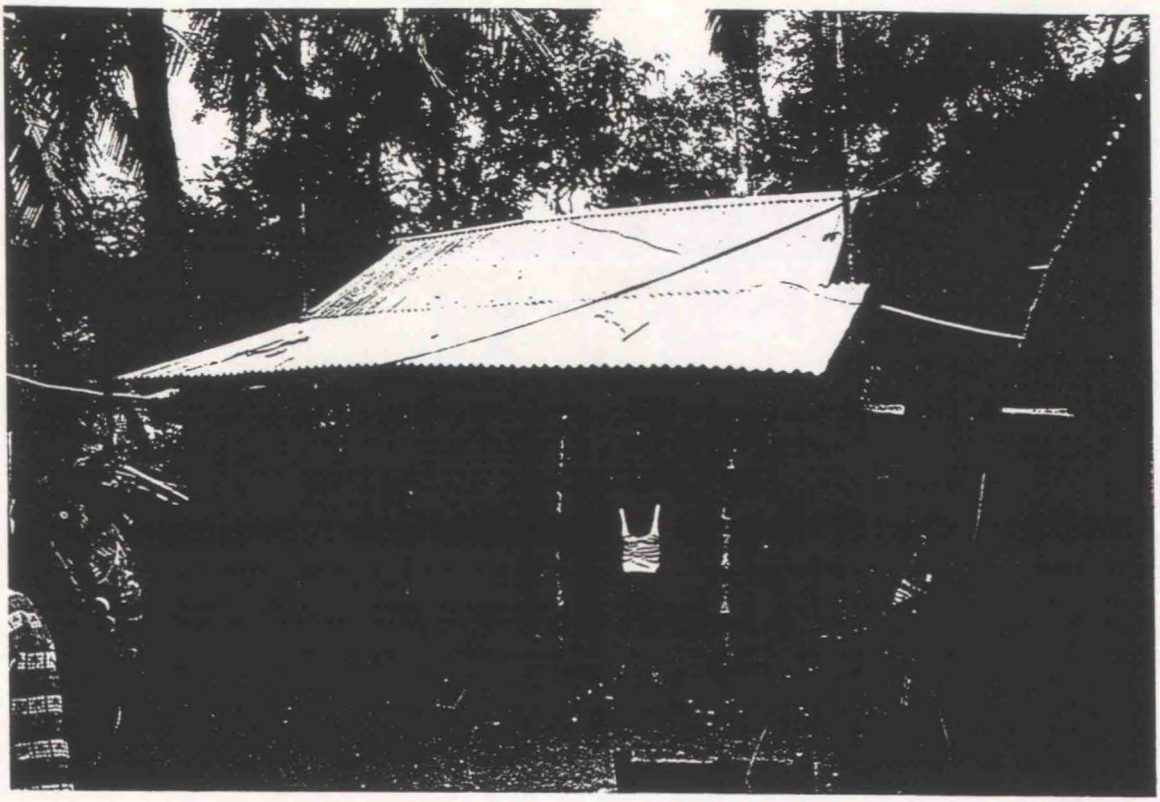
SITE LAYOUT

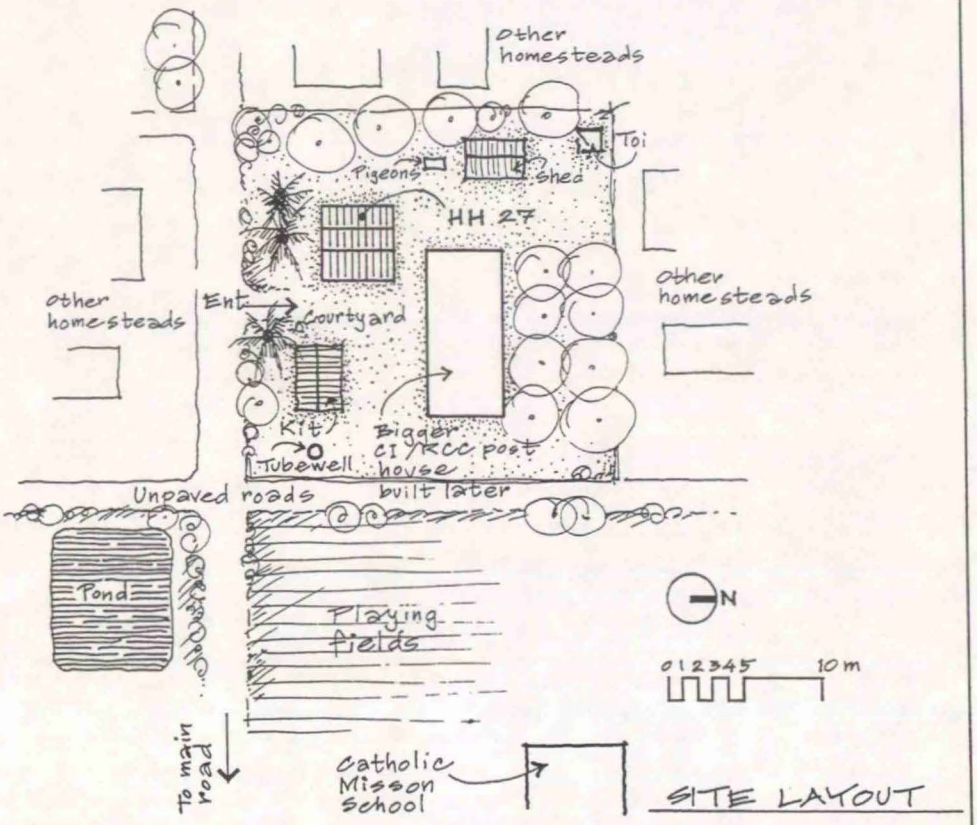
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
26	ETDA-LGED	Faridpur	Enamul Ali	1994





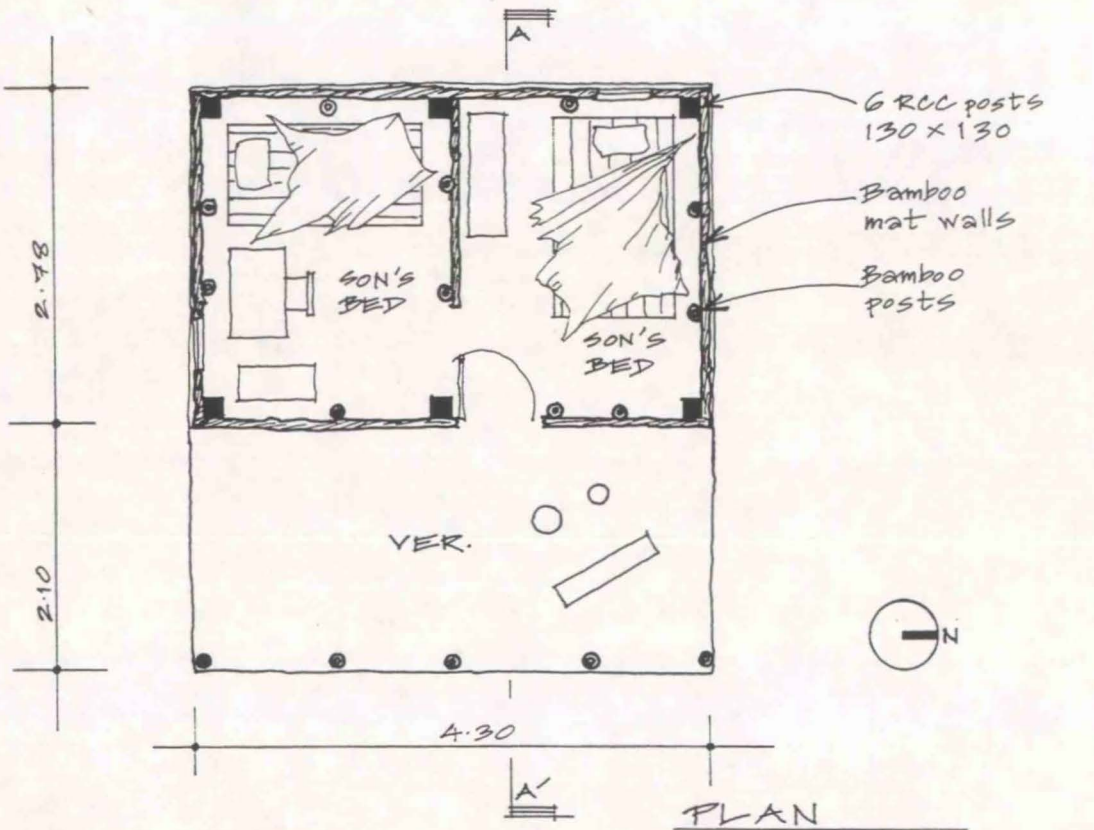
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
26	ETDA-LGED	Faridpur	Enamul Ali	1994





SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR: BUILT
27	ETDA-LGED	Faridpur	Ashim Gaine	1993



PLAN

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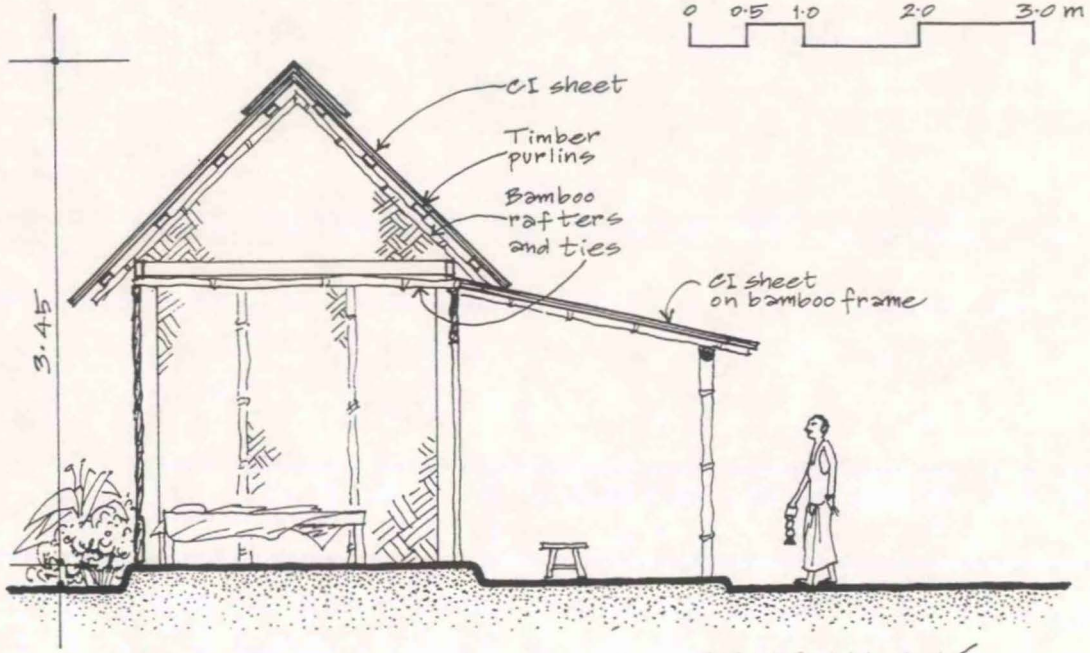
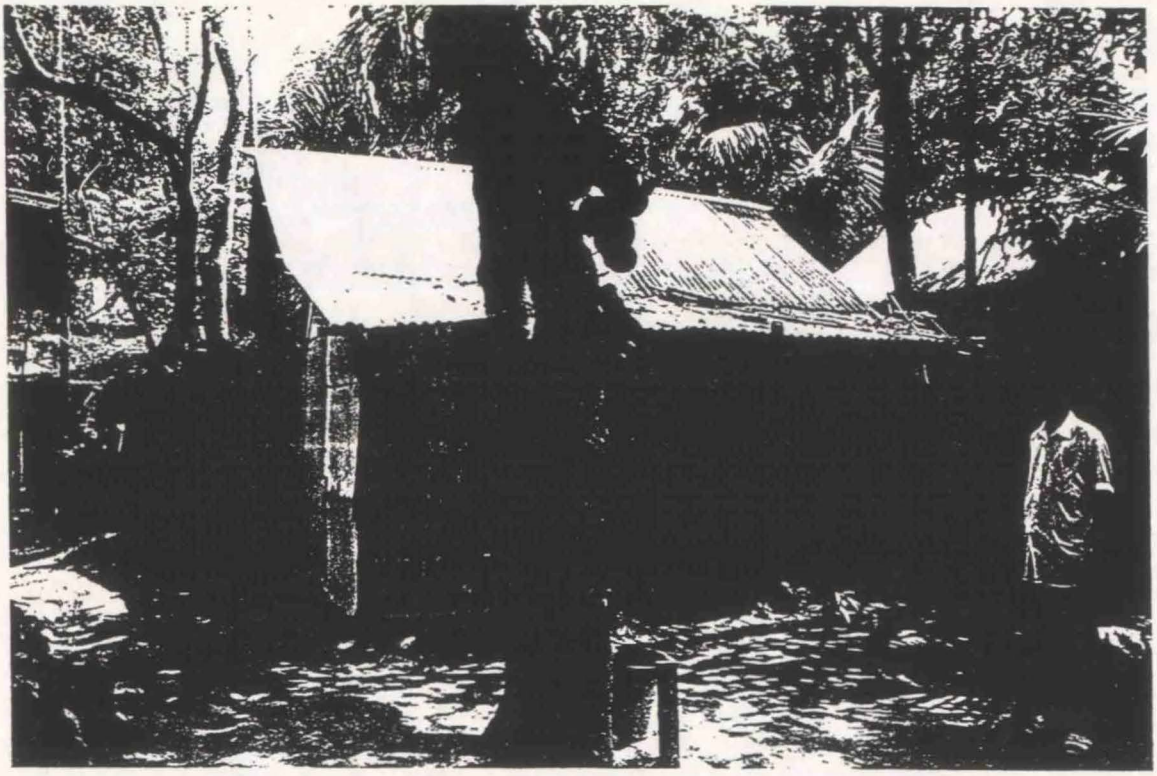
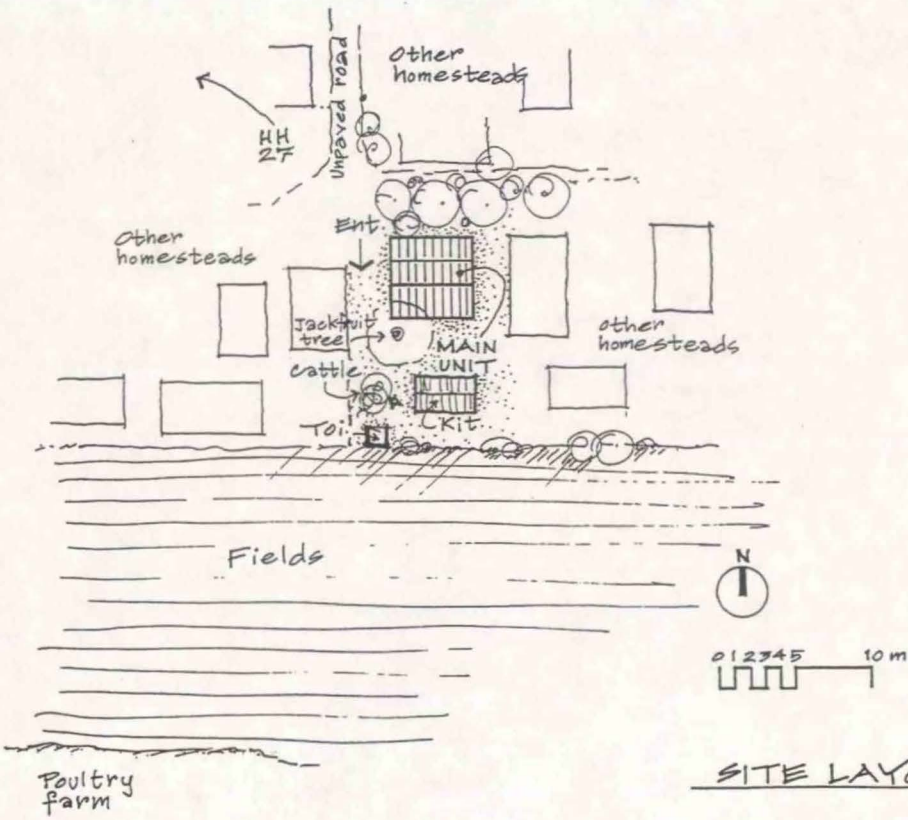


SECTION AA'

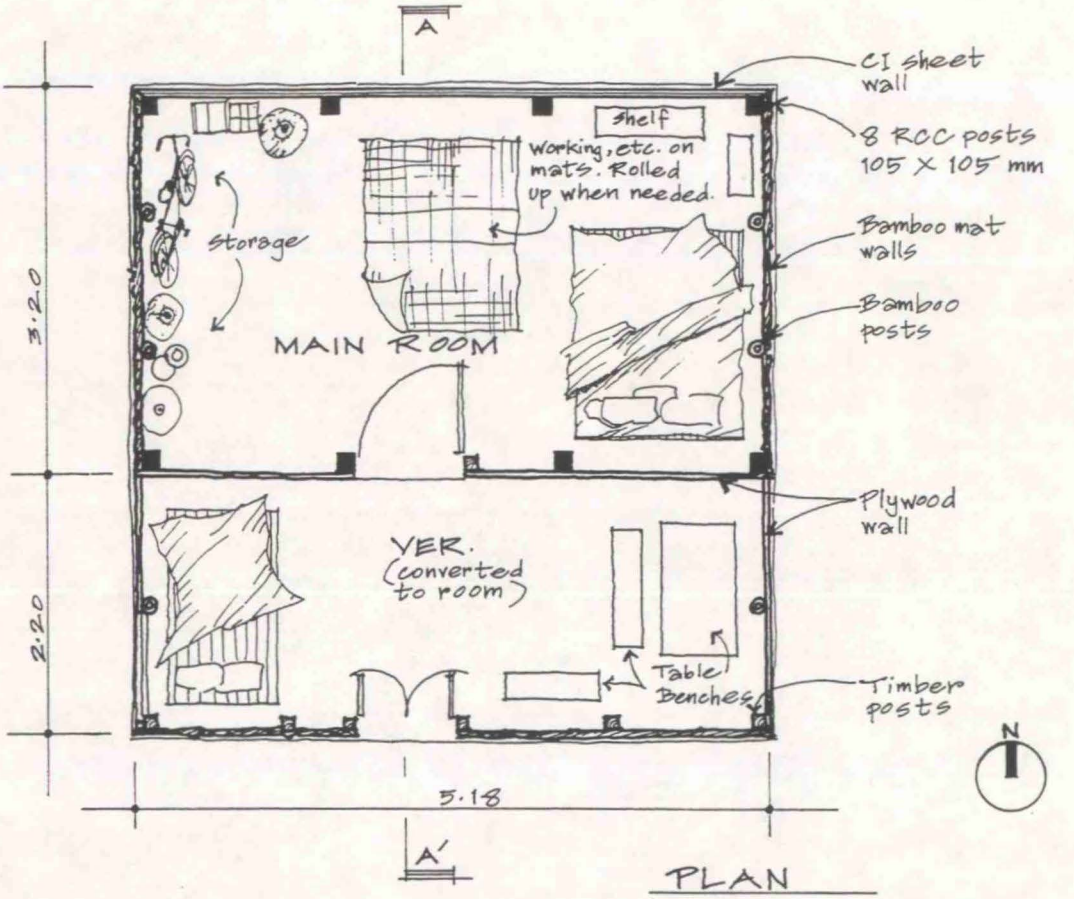
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
27	ETDA-LGED	Faridpur	Ashim Gaine	1993





SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
28	None	Faridpur	Lota Bala	1997



PLAN

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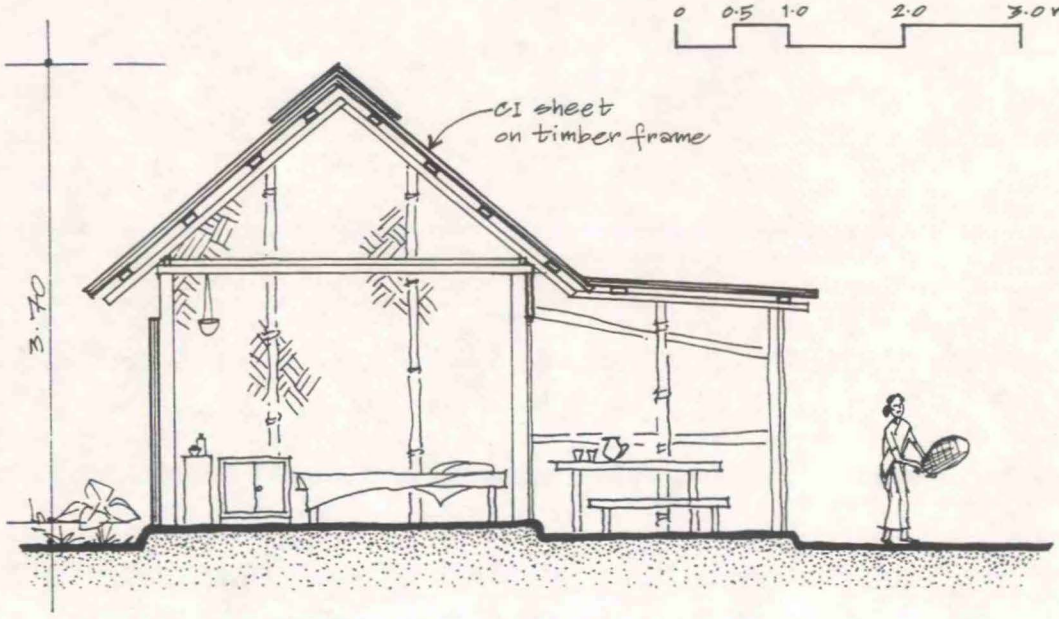
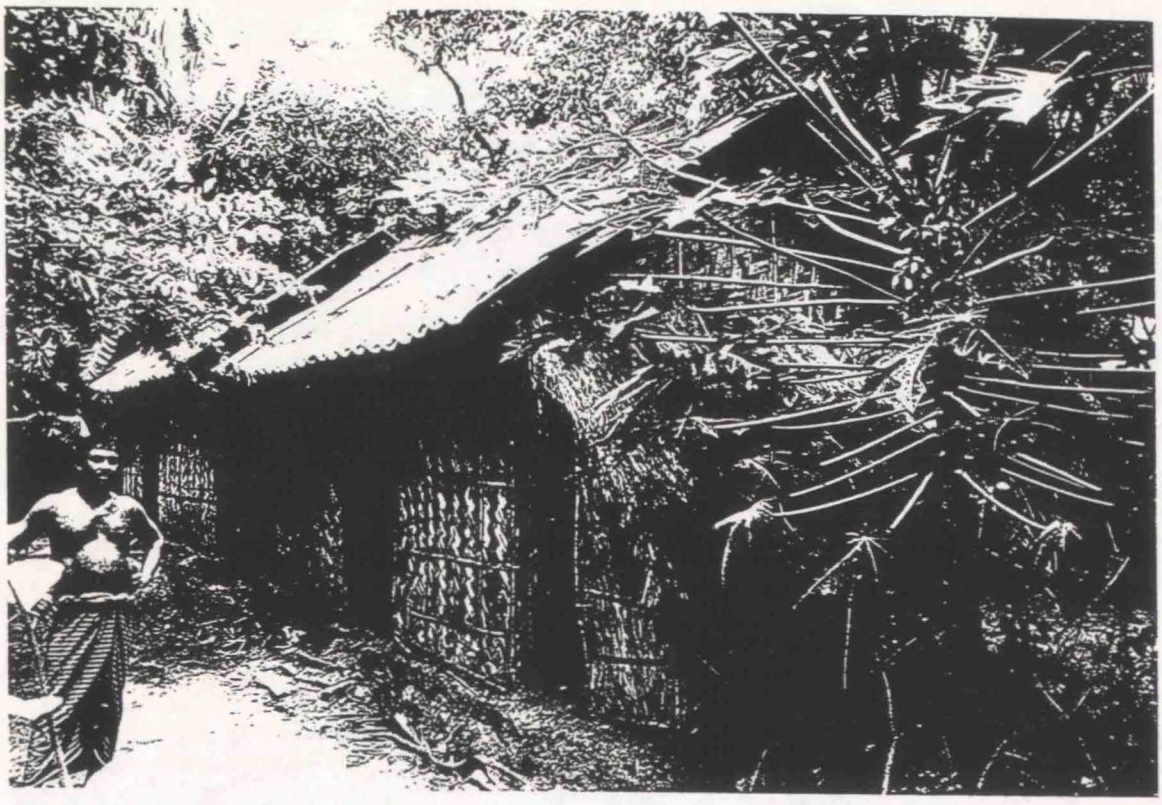
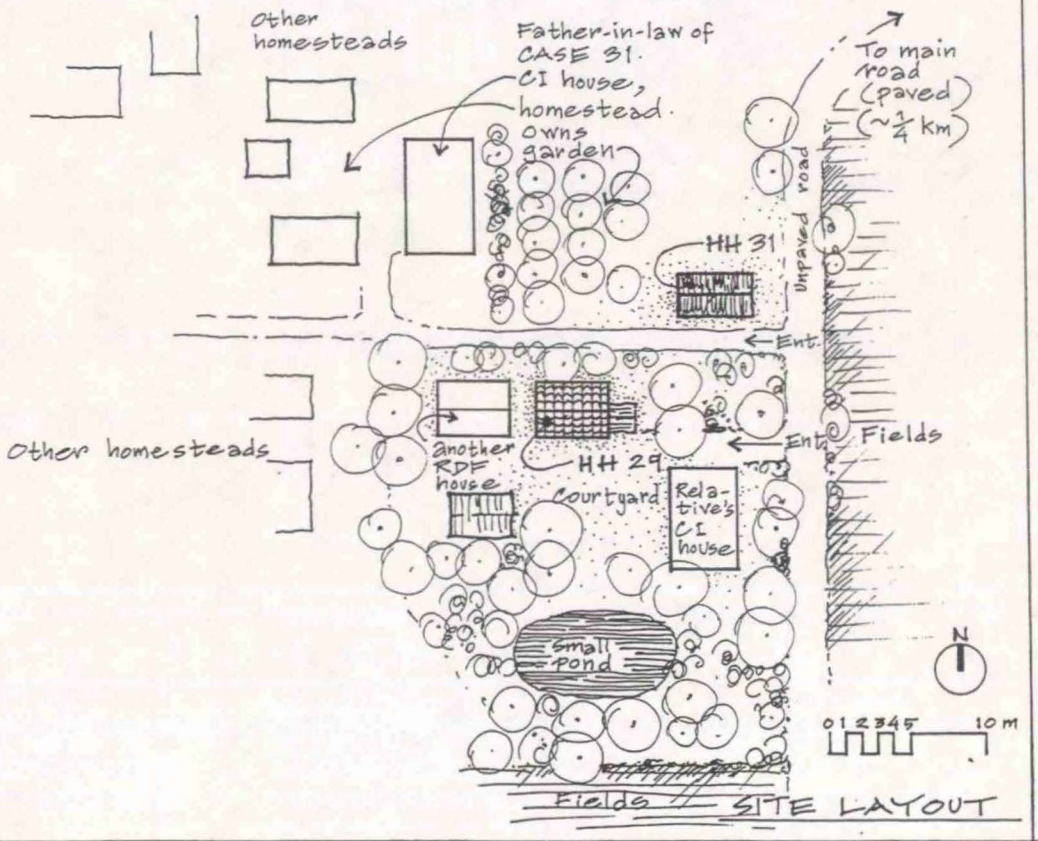


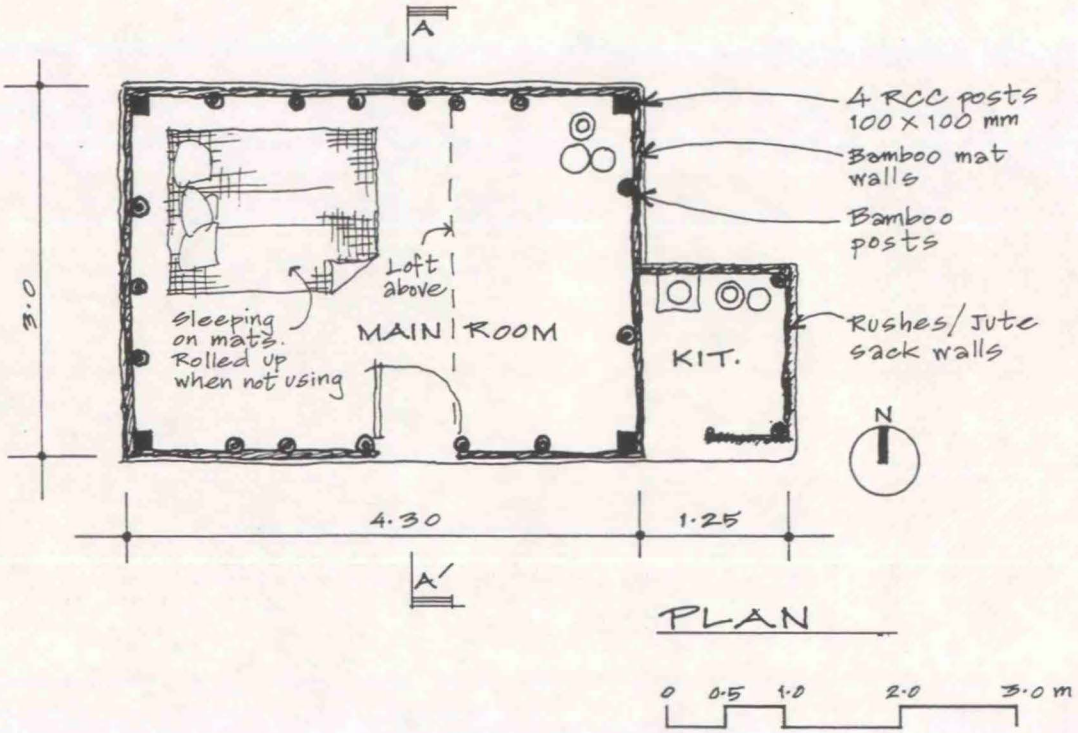
SECTION AA'

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
28	None	Faridpur	Lota Bala	1997



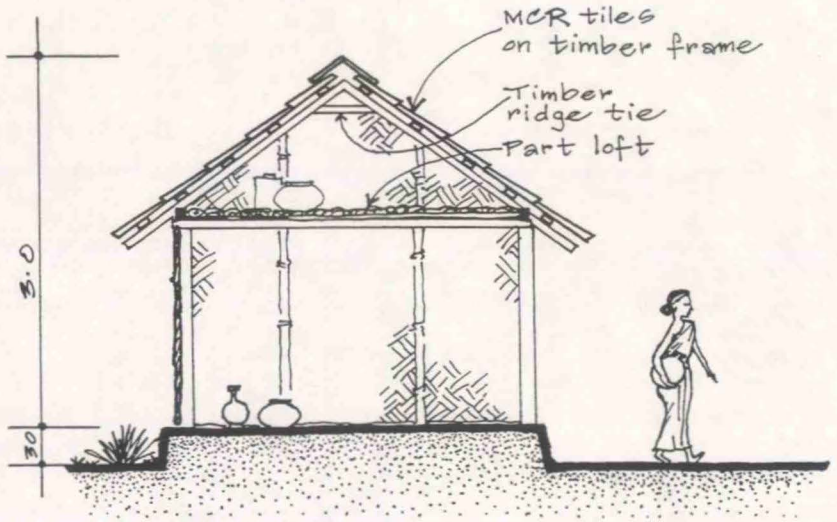


HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
29	RDF	Noakhali	Jasmin Ara	1993



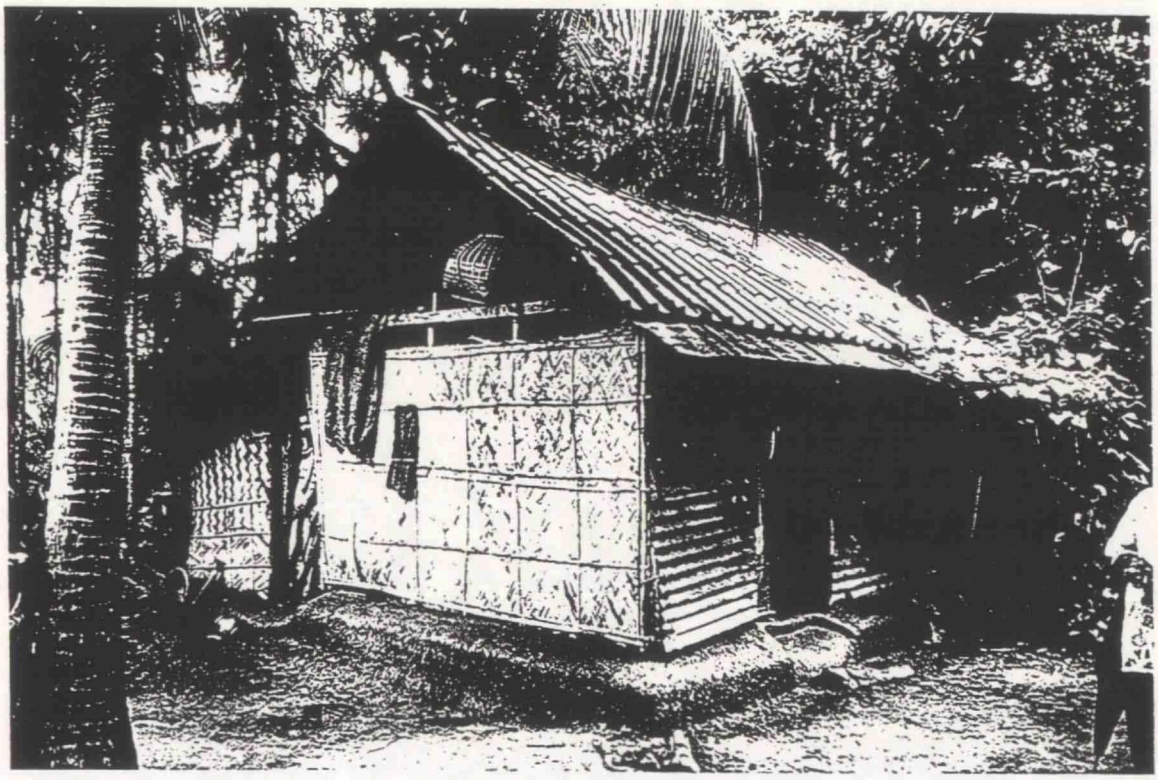
PLAN

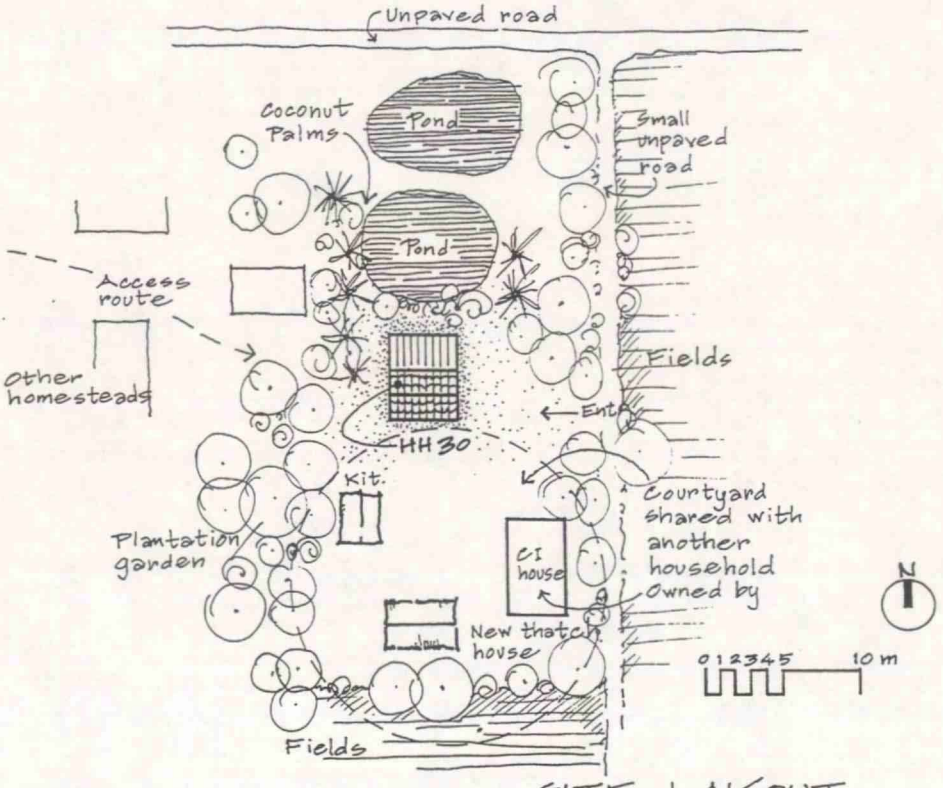
0 0.5 1.0 2.0 3.0 m



SECTION AA'

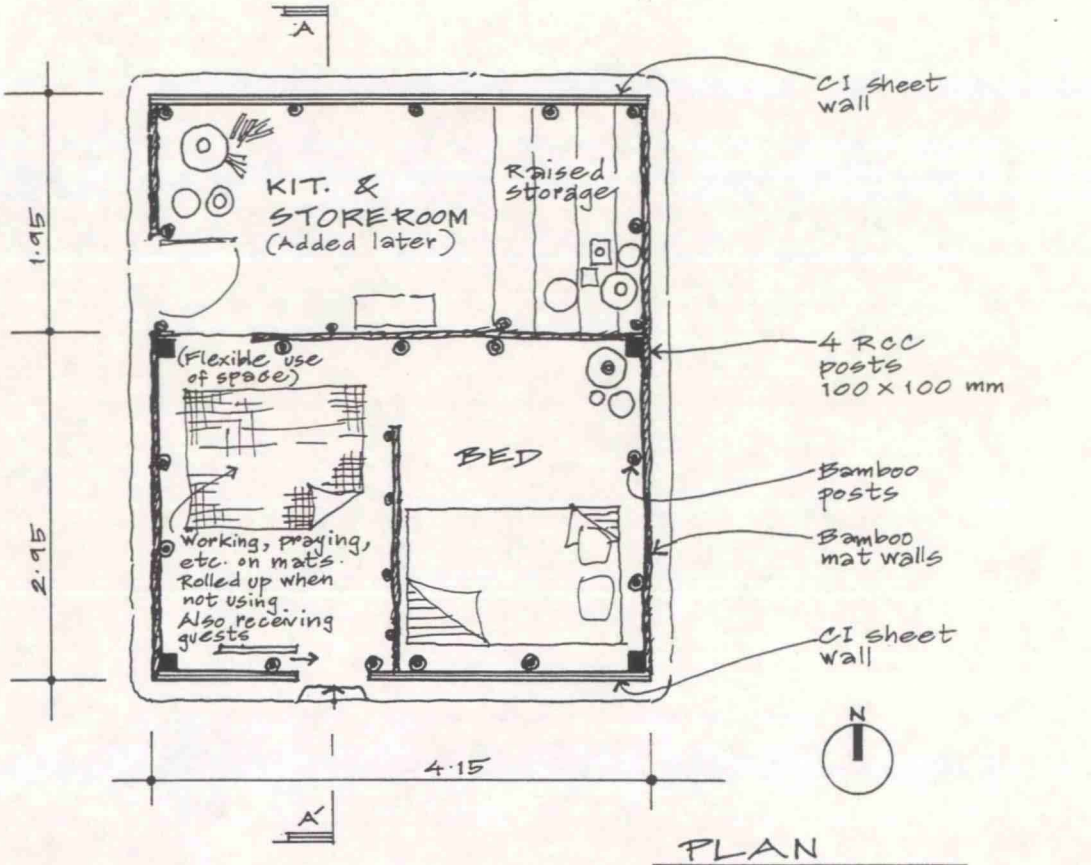
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
29	RDF	Noakhali	Jasmin Ara	1993





SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
30	RDF	Noakhali	Masuda Khatun	1993



PLAN

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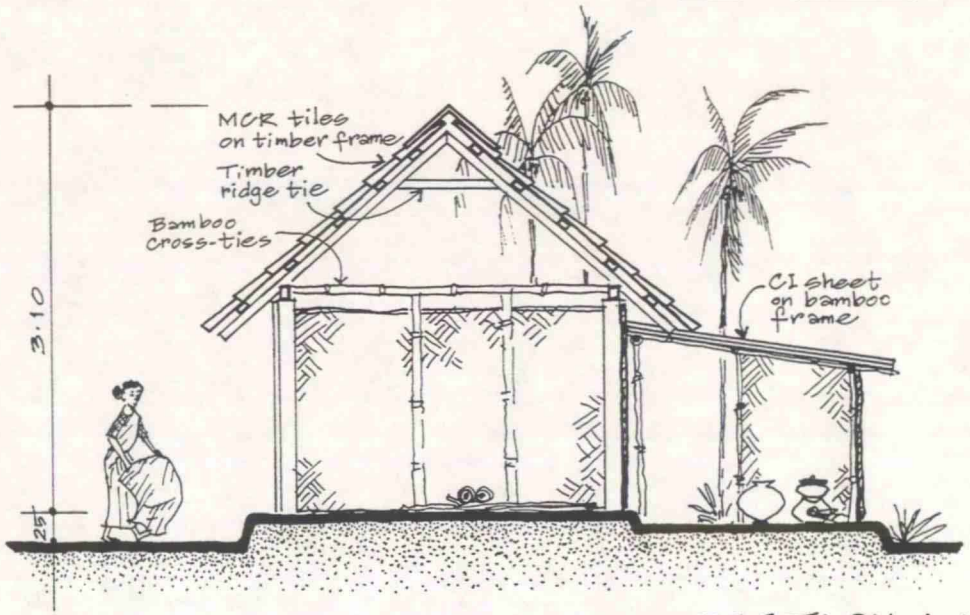
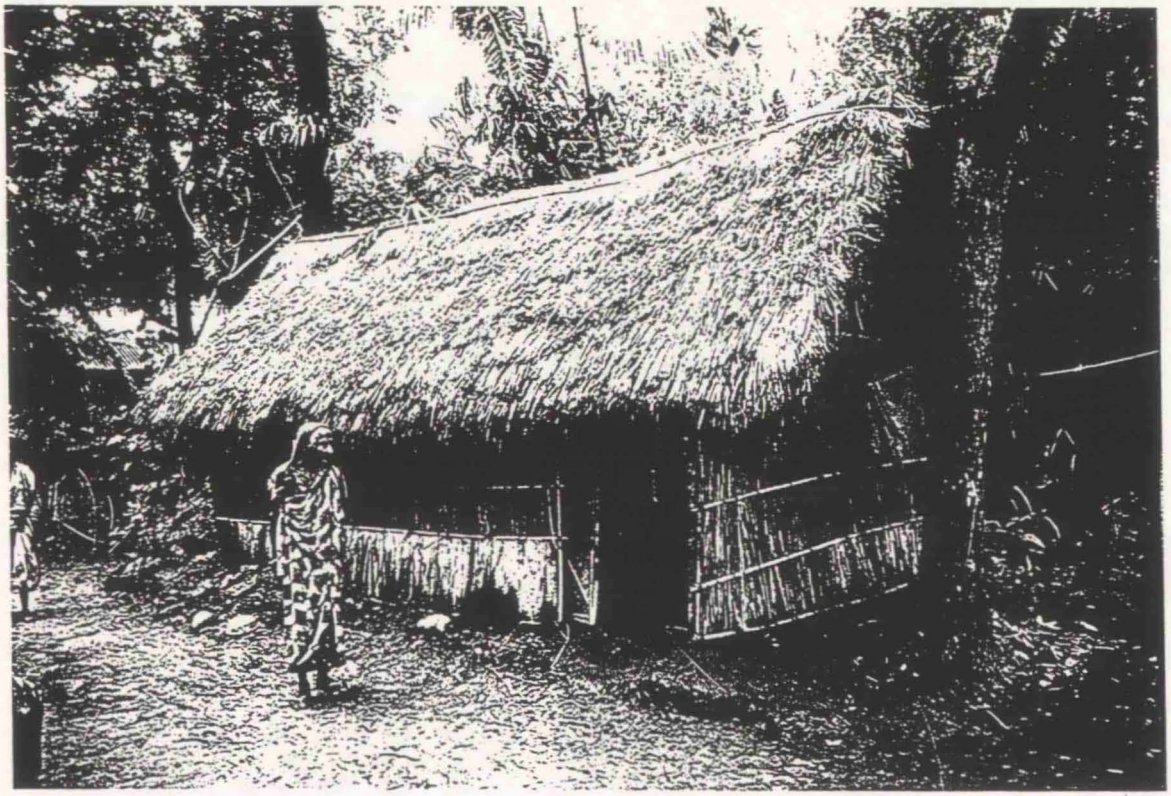
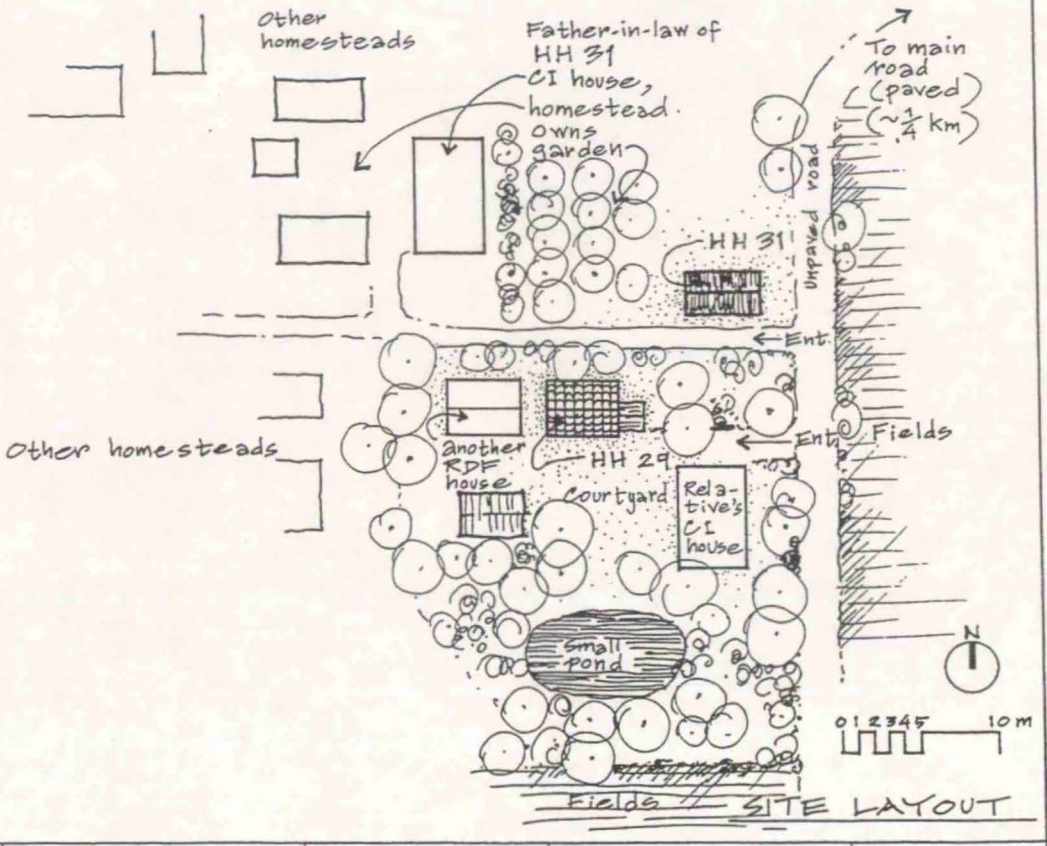


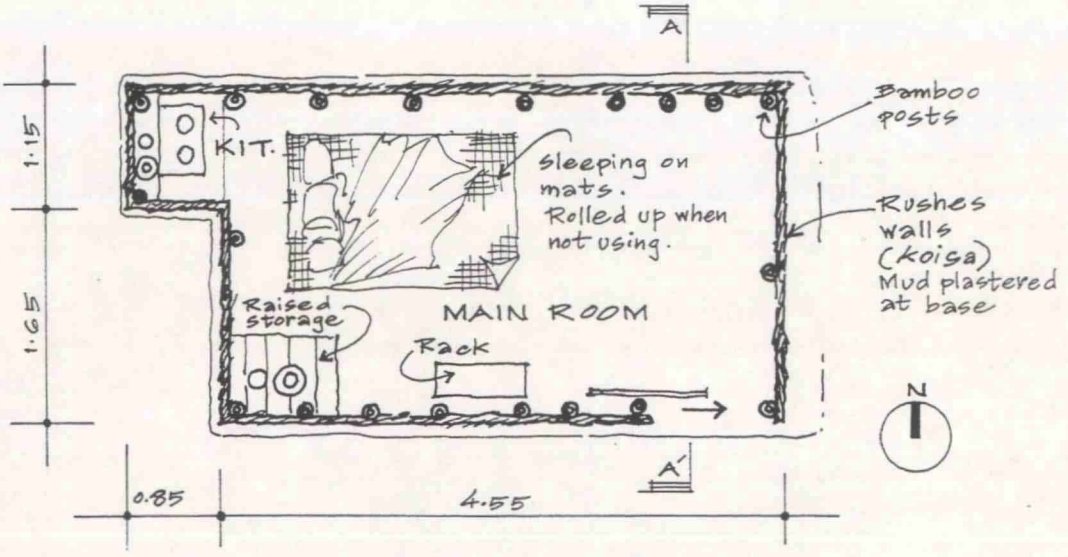
SECTION AA'

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
30	RDF	Noakhali	Masuda Khatun	1993





HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
31	None	Noakhali	Mofizul Haq	1997



PLAN

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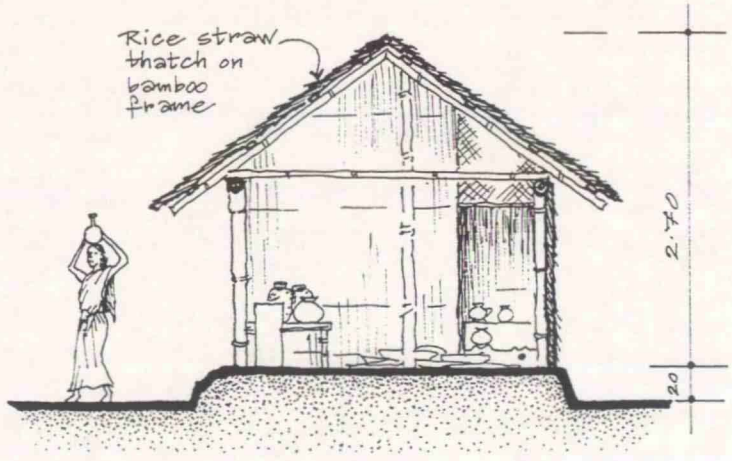
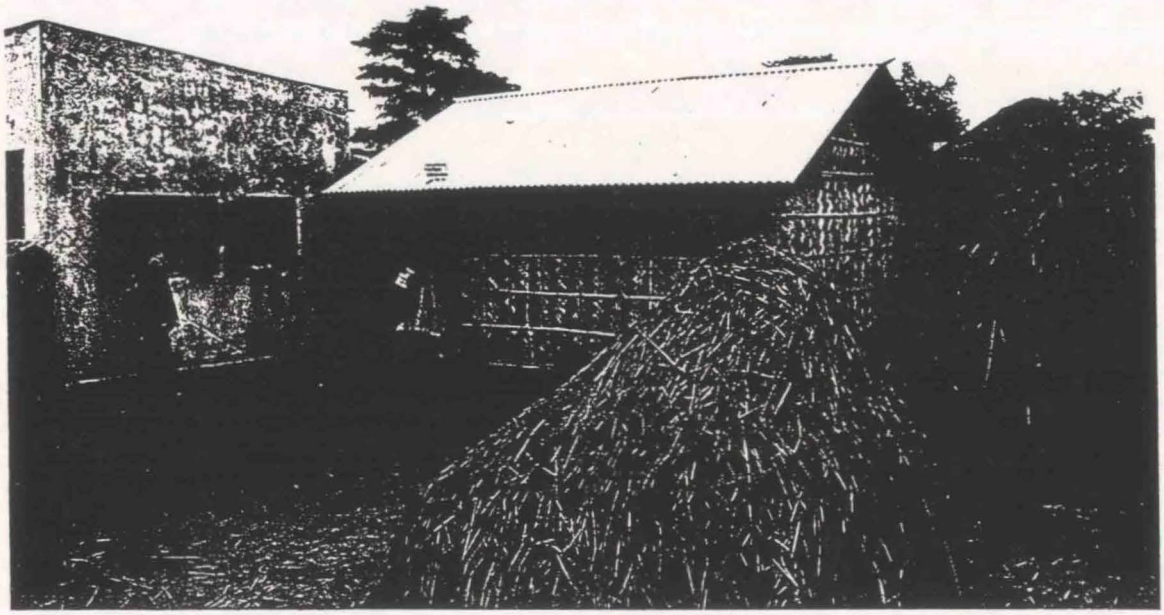
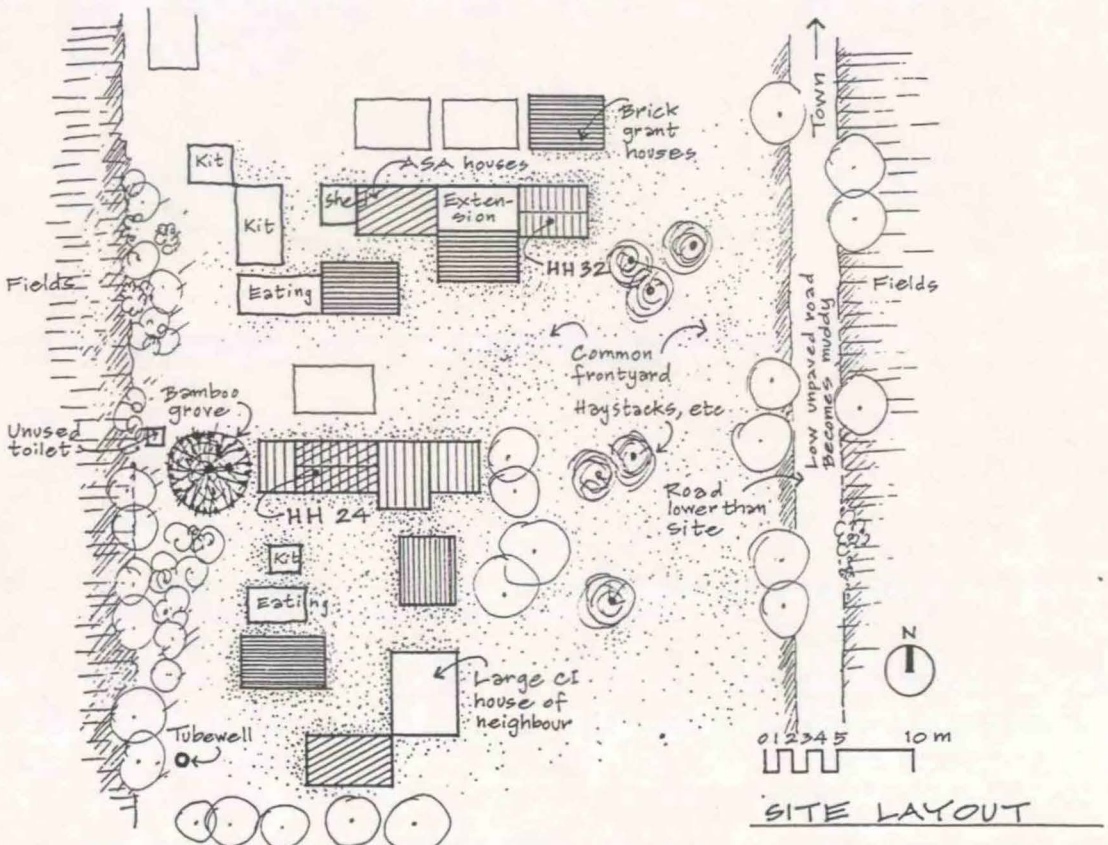


SECTION AA'

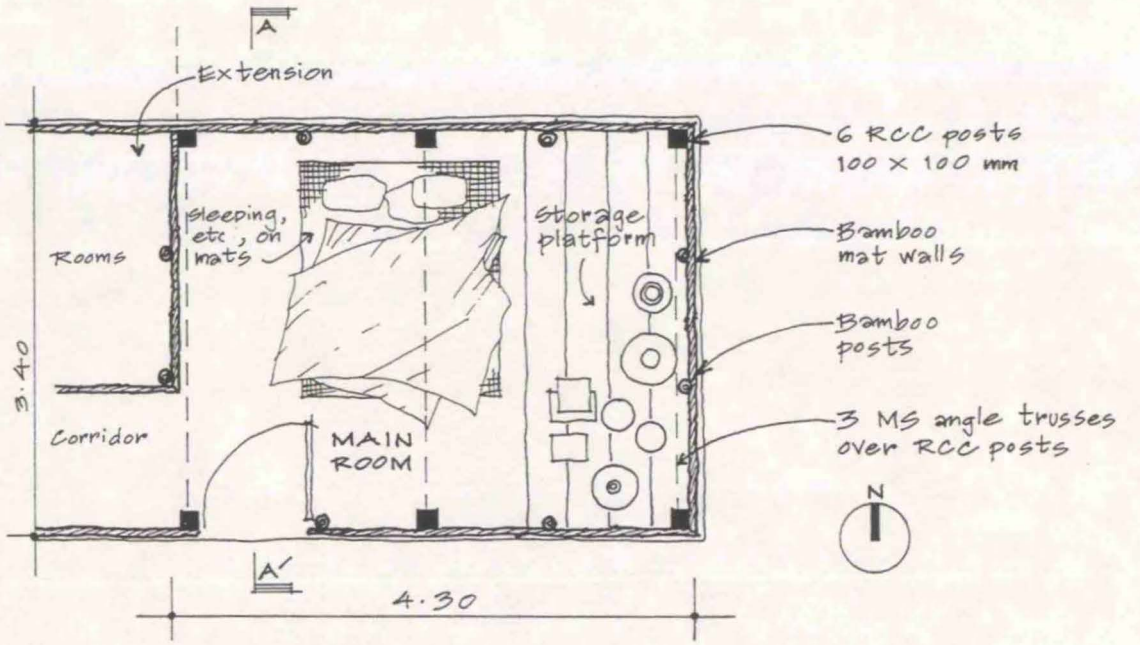
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
31	None	Noakhali	Mofizul Haq	1997



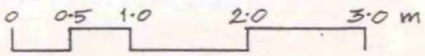


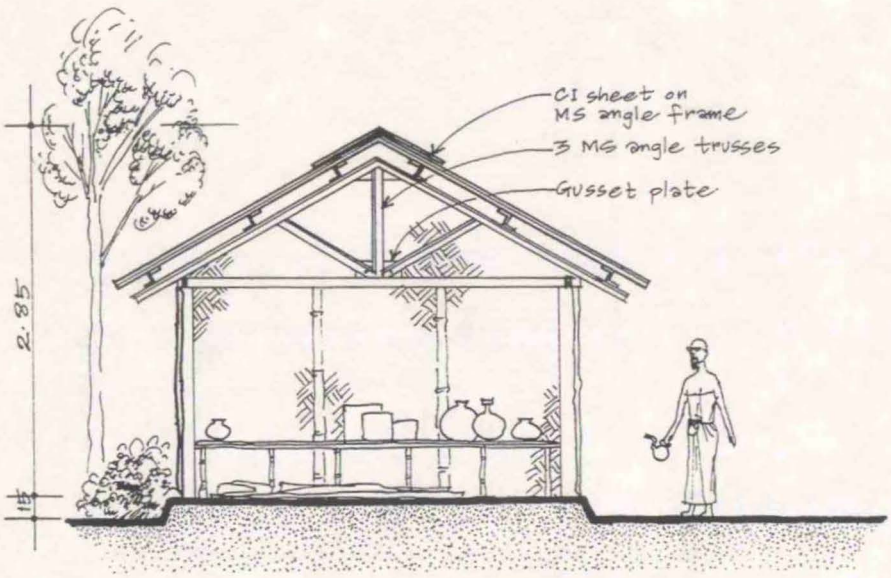
SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
32	Caritas	Tangail	Shehab Ali	1996



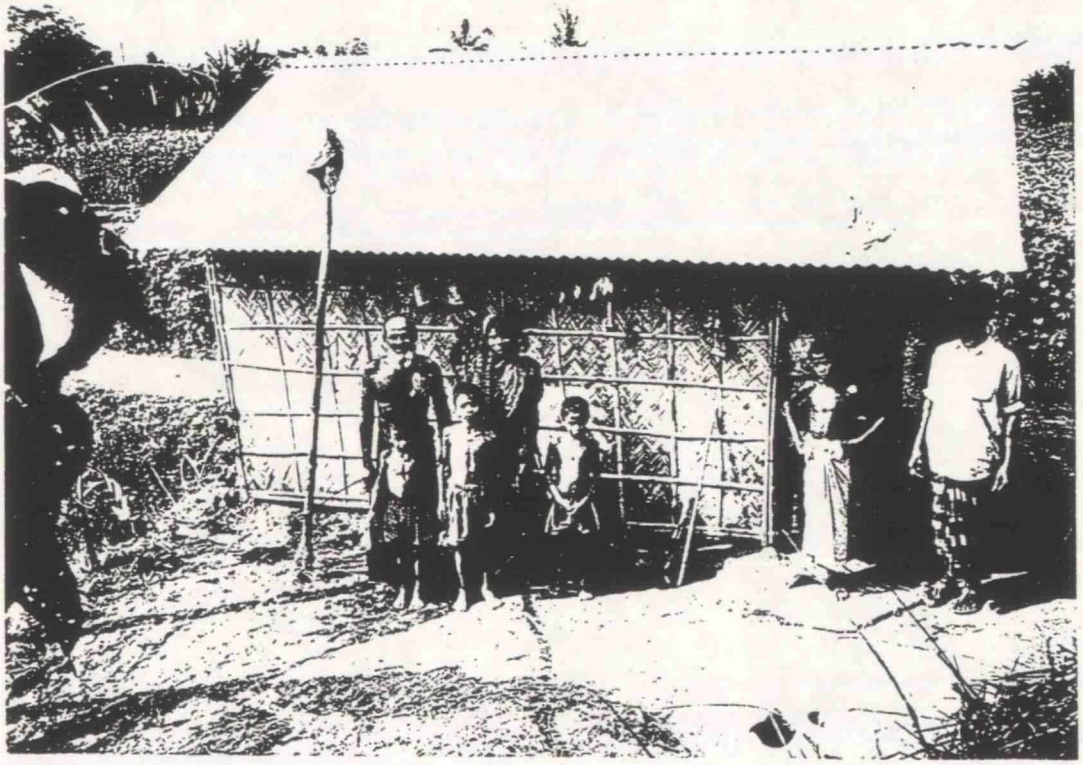
PLAN

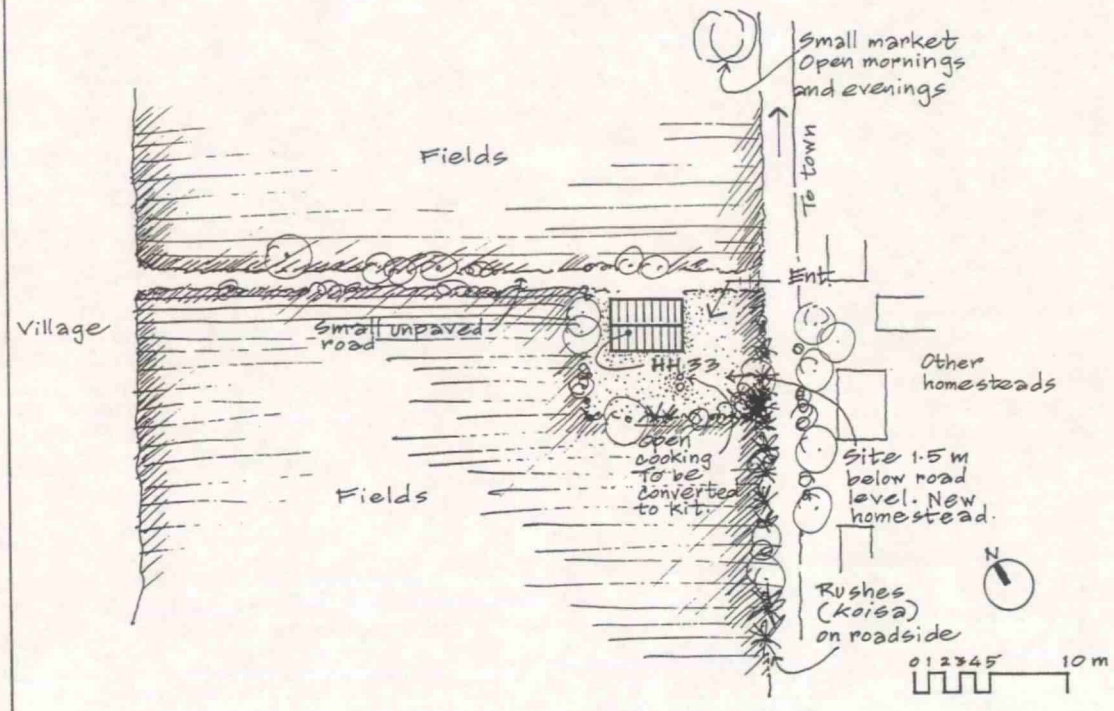




SECTION AA'

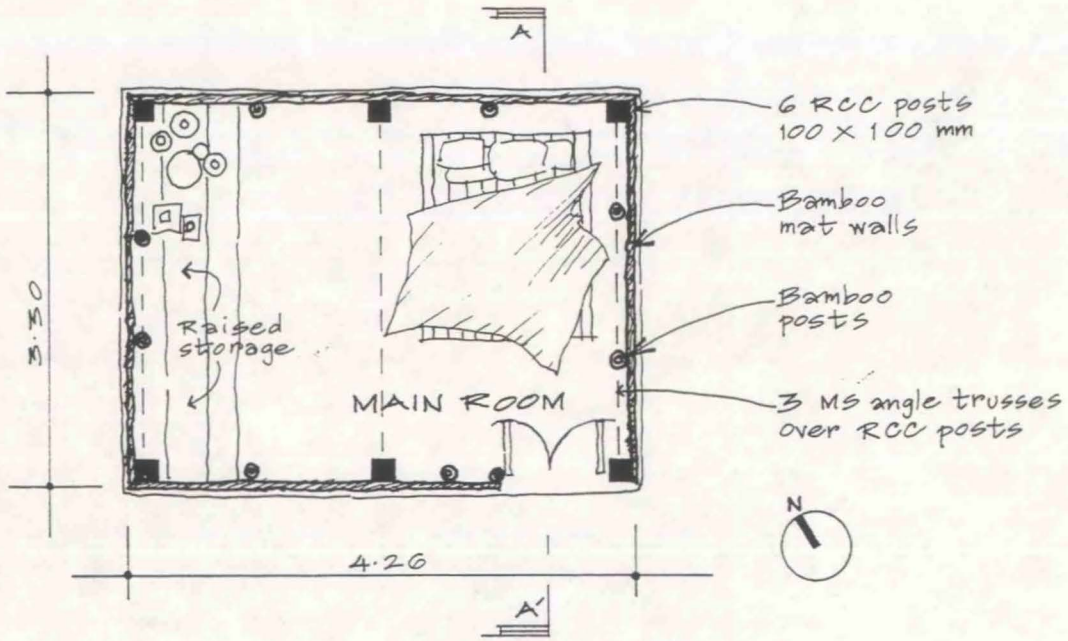
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
32	Caritas	Tangail	Shehab Ali	1996



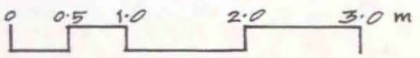


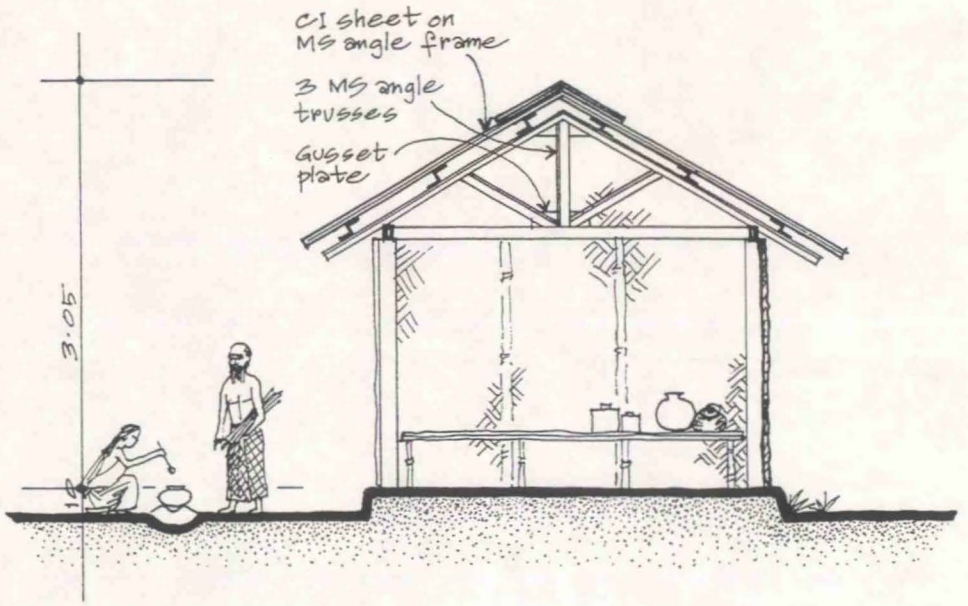
SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
33	Caritas	Tangail	Anis Ali	1996



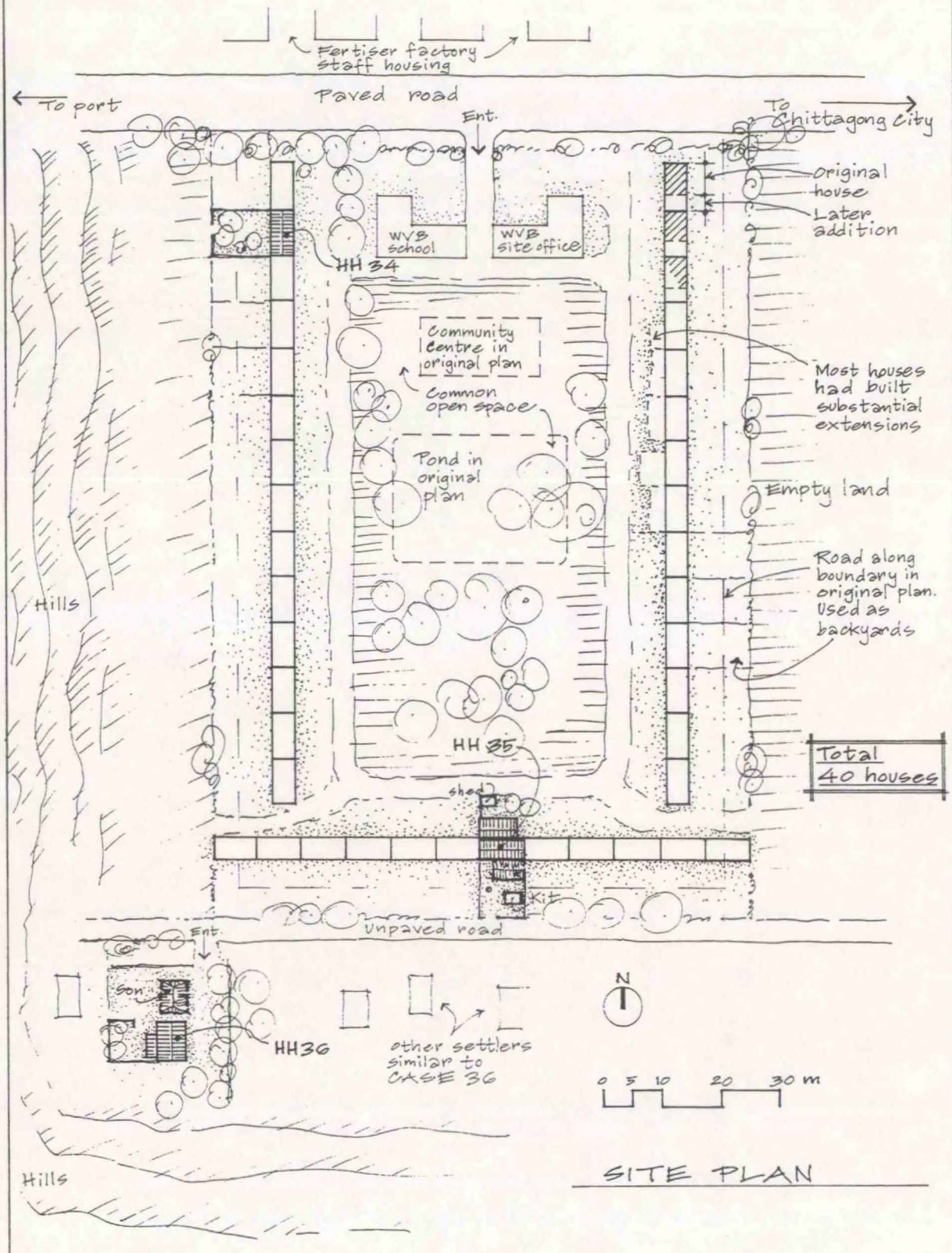
PLAN



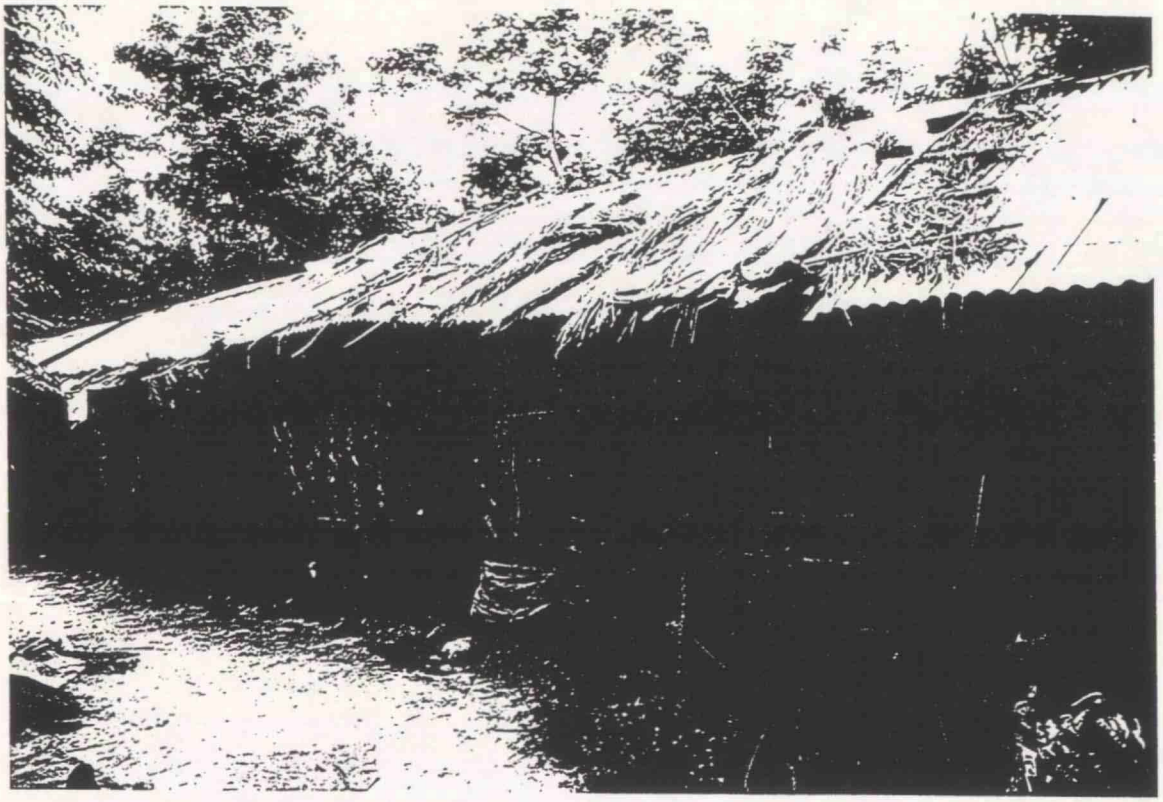


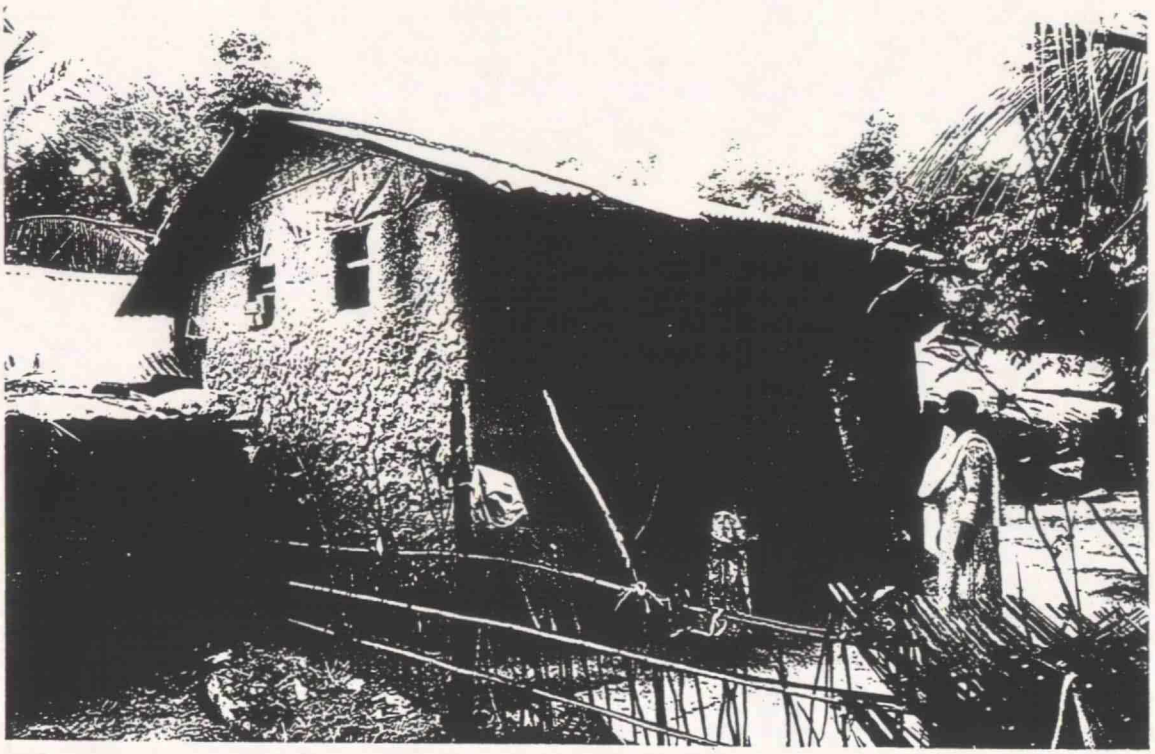
SECTION AA'

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
33	Caritas	Tangail	Anis Ali	1996

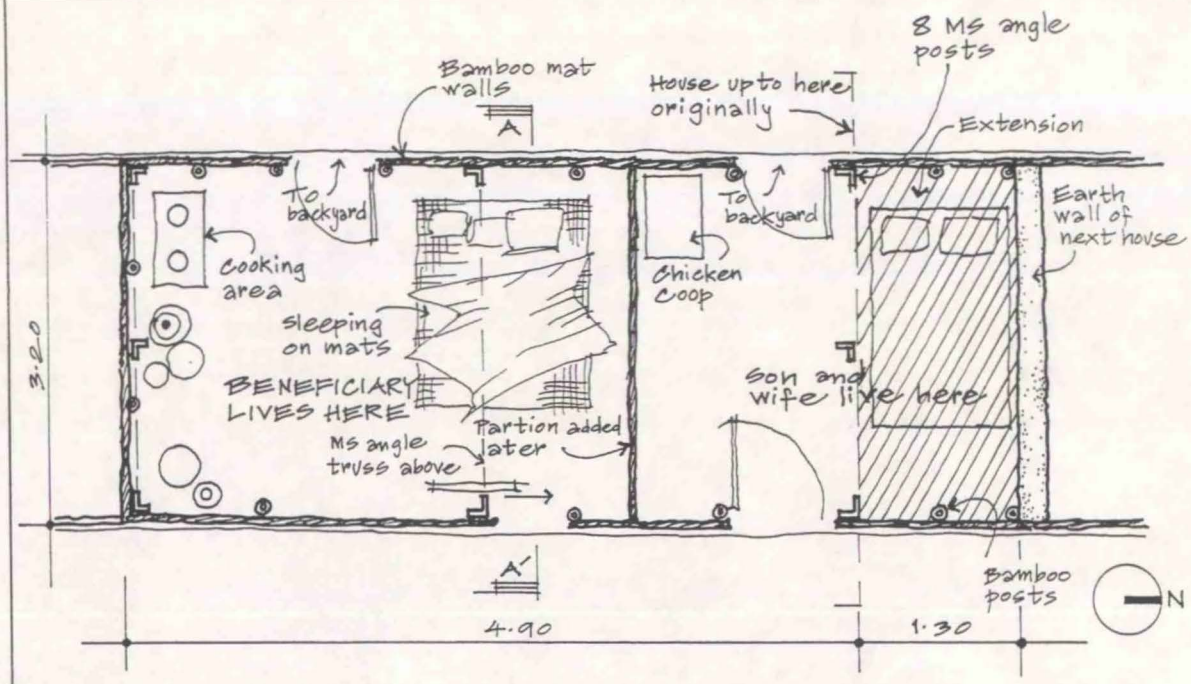


HHs	PROGRAMME	LOCATION	RESPONDENTS	YR. BUILT
34, 35, 36	AG-WVB	Chittagong	Jannatara Islam Shopon Mia Shaheda Khatun	1990 1992





HHs	PROGRAMME	LOCATION	RESPONDENTS	YR. BUILT
34,35	AG-WVB	Chittagong	Jannatara Islam Shopon Mia	1990



PLAN

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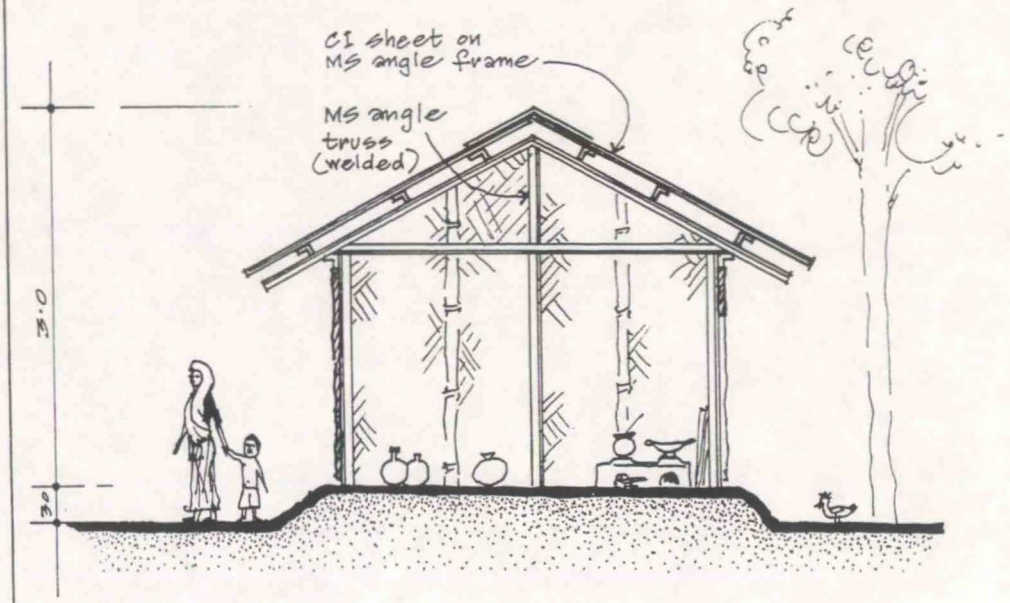
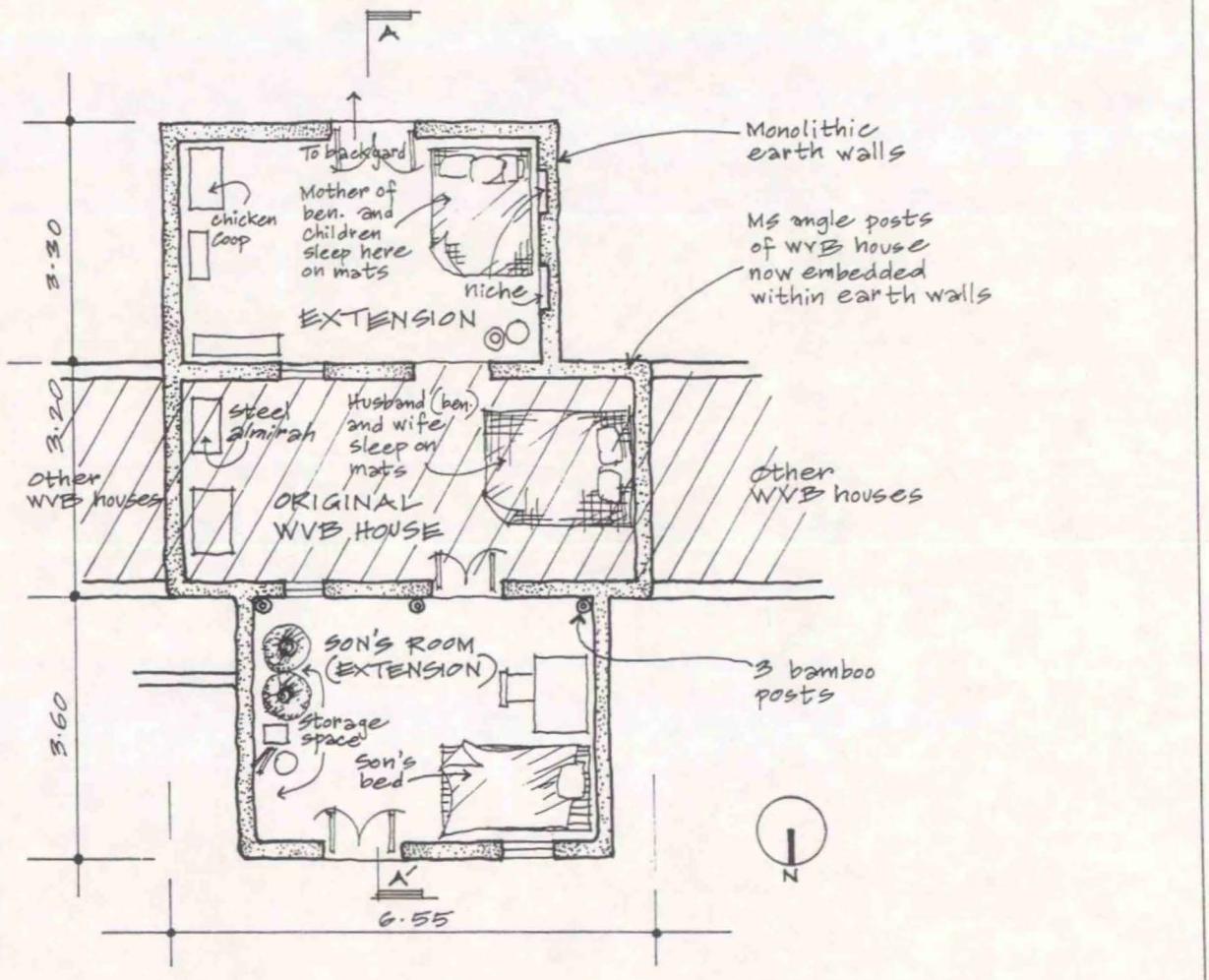


SECTION AA'

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
34	AG-WVB	Chittagong	Jannatara Islam	1990



PLAN

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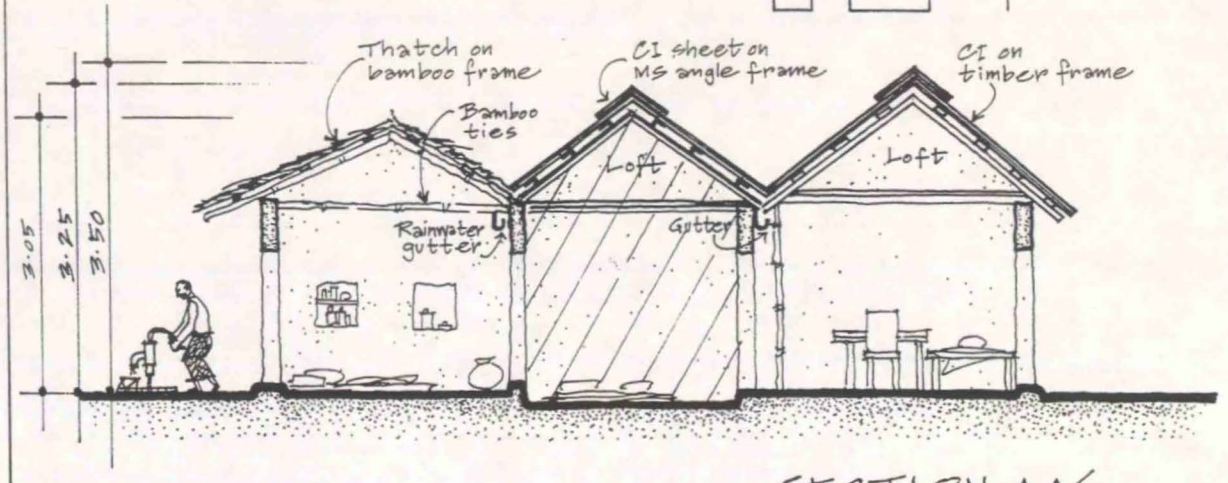
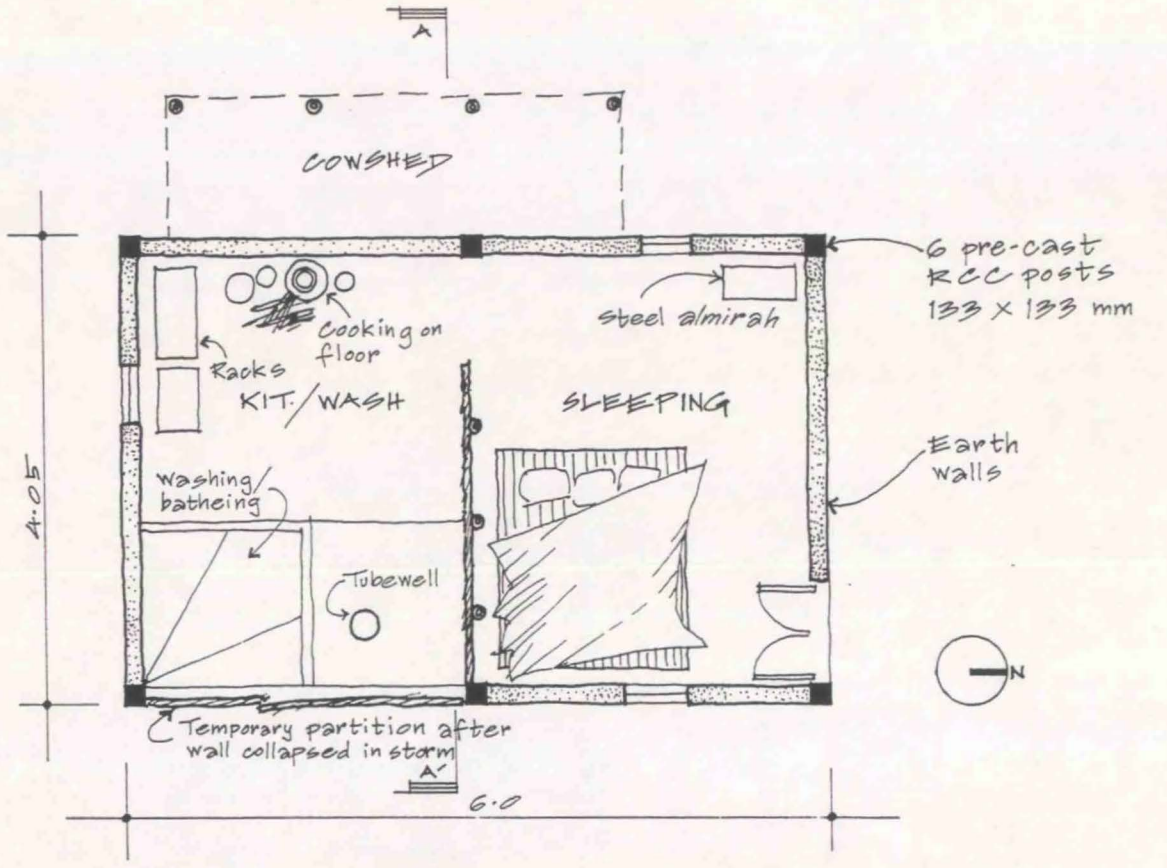


SECTION AA'

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
35	AG-WVB	Chittagong	Shopon Mia	1990

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
36	None	Chittagong	Shaheda Khatun	1992



PLAN

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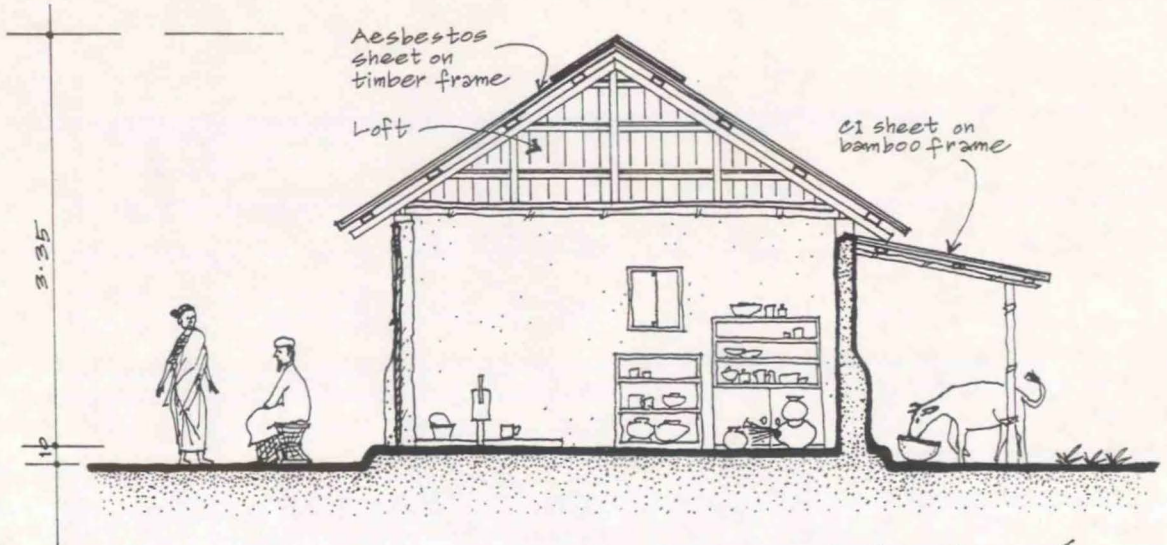
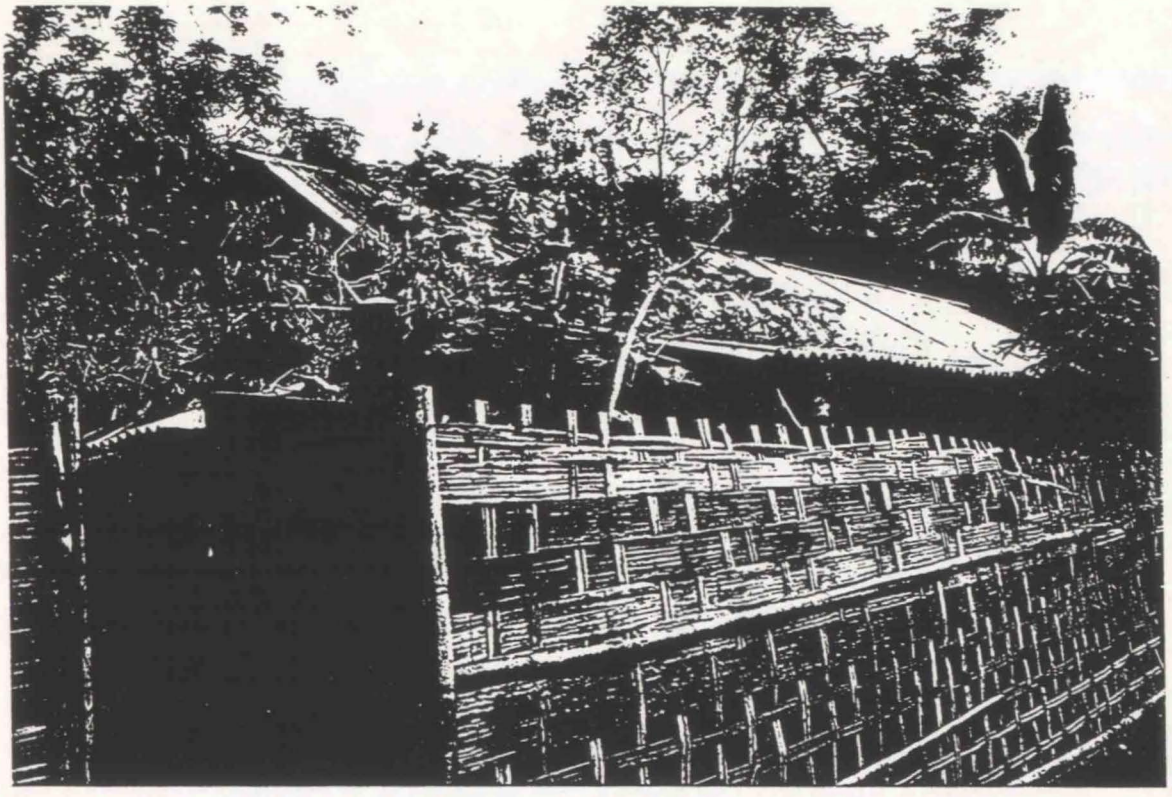
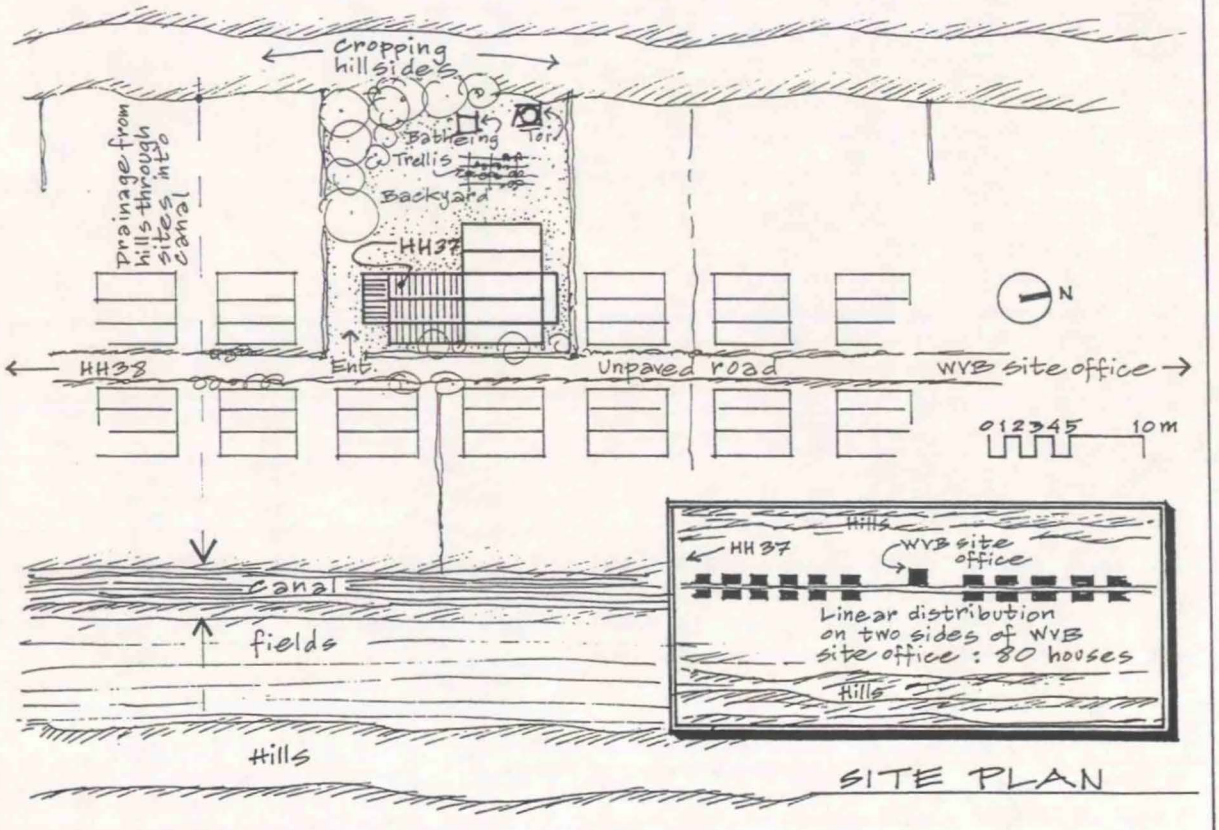


SECTION AA'

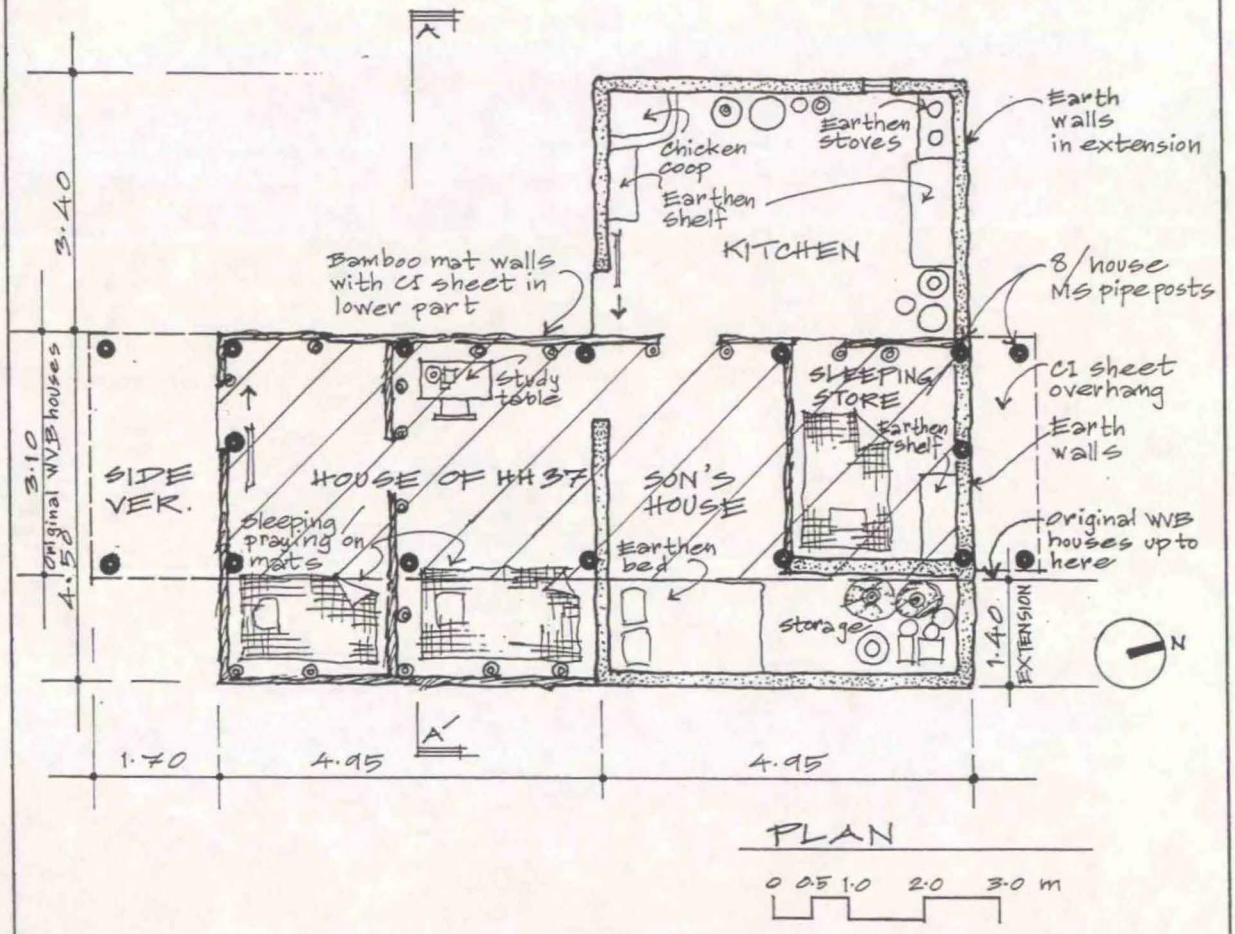
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
36	None	Chittagong	Shaheda Khatun	1992

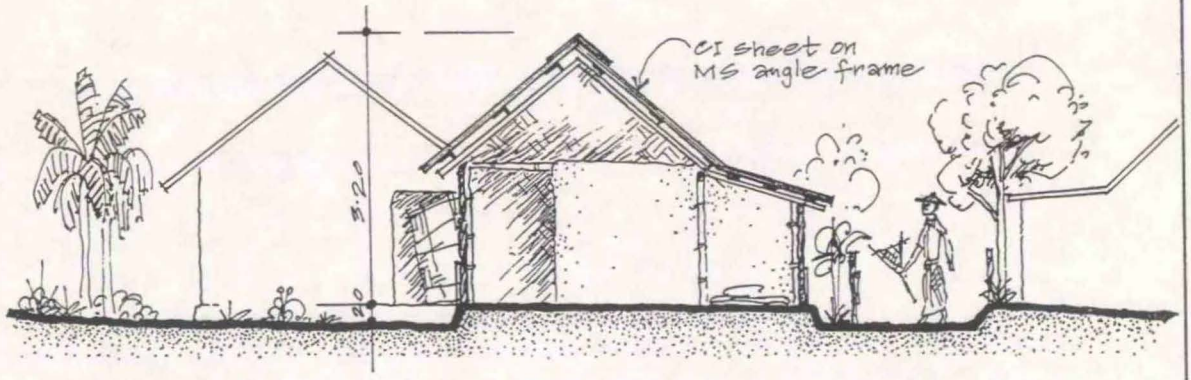




SITE PLAN

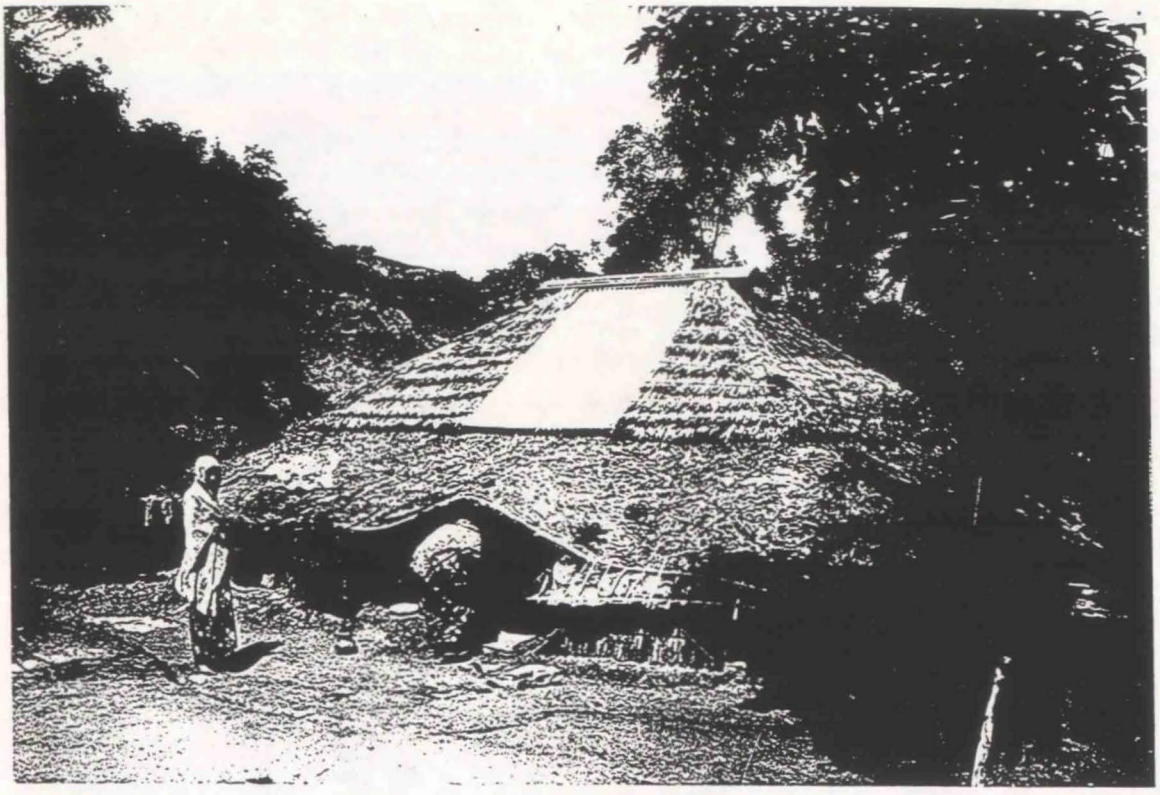
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
37	AG-WVB	Cox's Bazar	Sajjad Ullah	1988

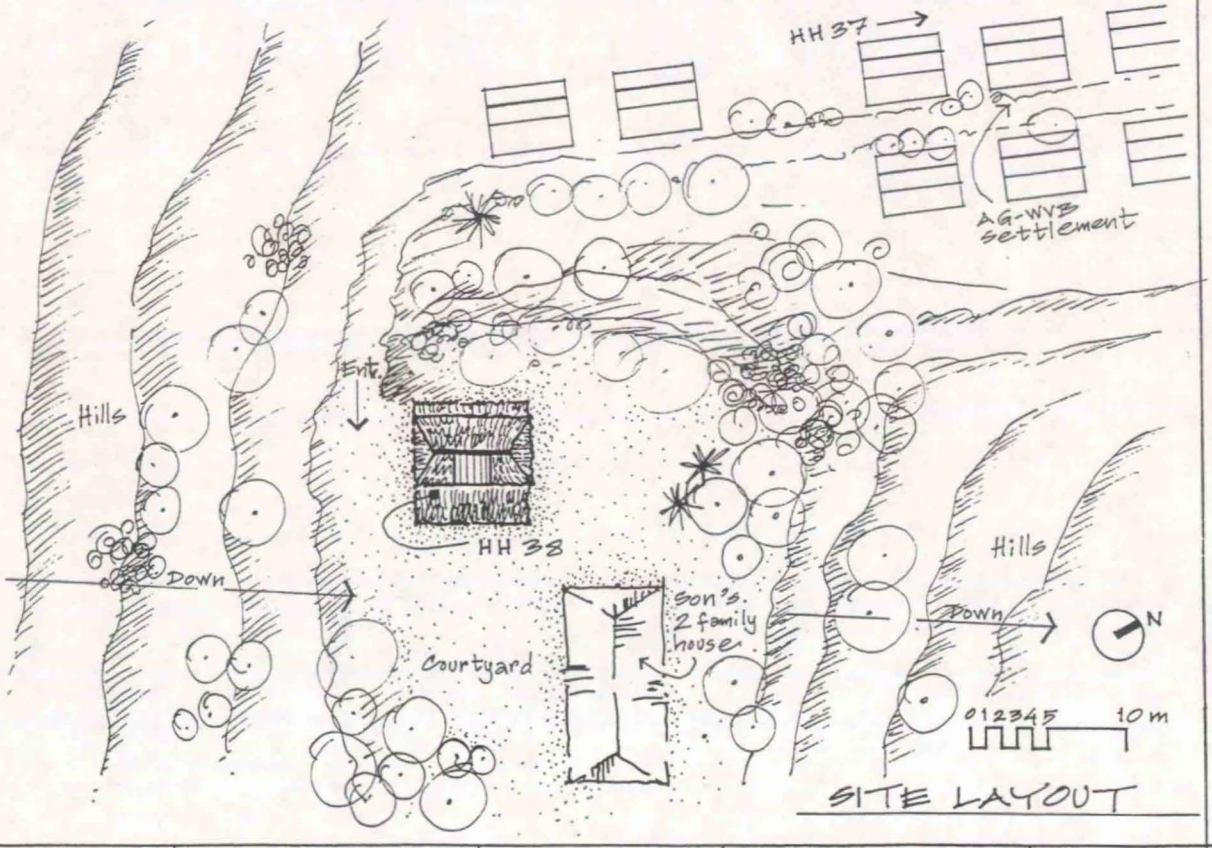




SECTION AA'

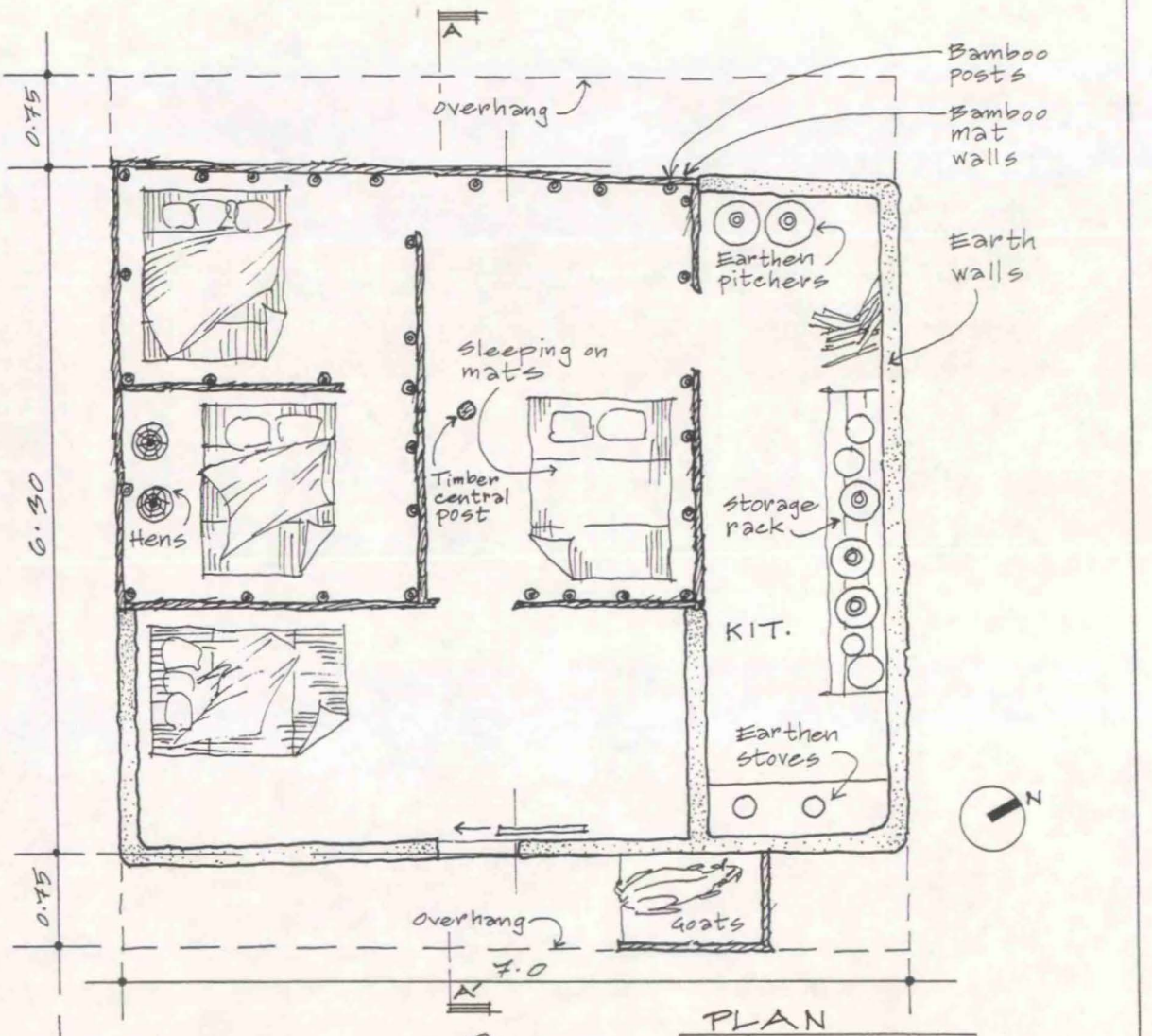
HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
37	AG-WVB	Cox's Bazar	Sajjad Ullah	1988





SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
38	Proshika/gen. loan	Cox's Bazar	Sajeda Begum	1994



PLAN

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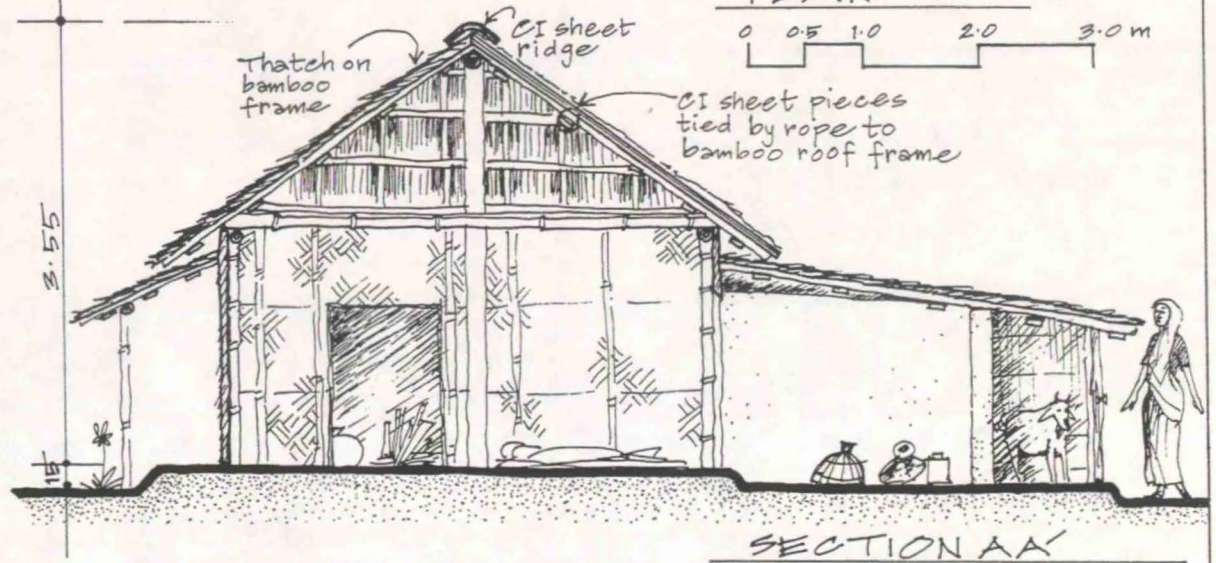
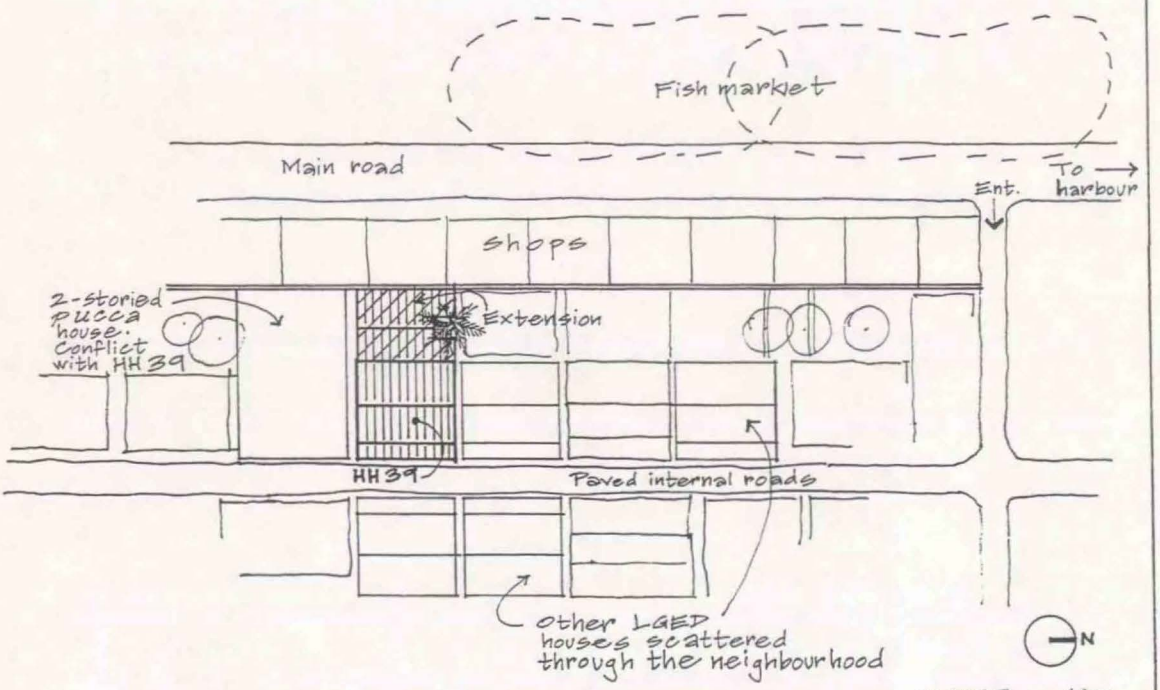


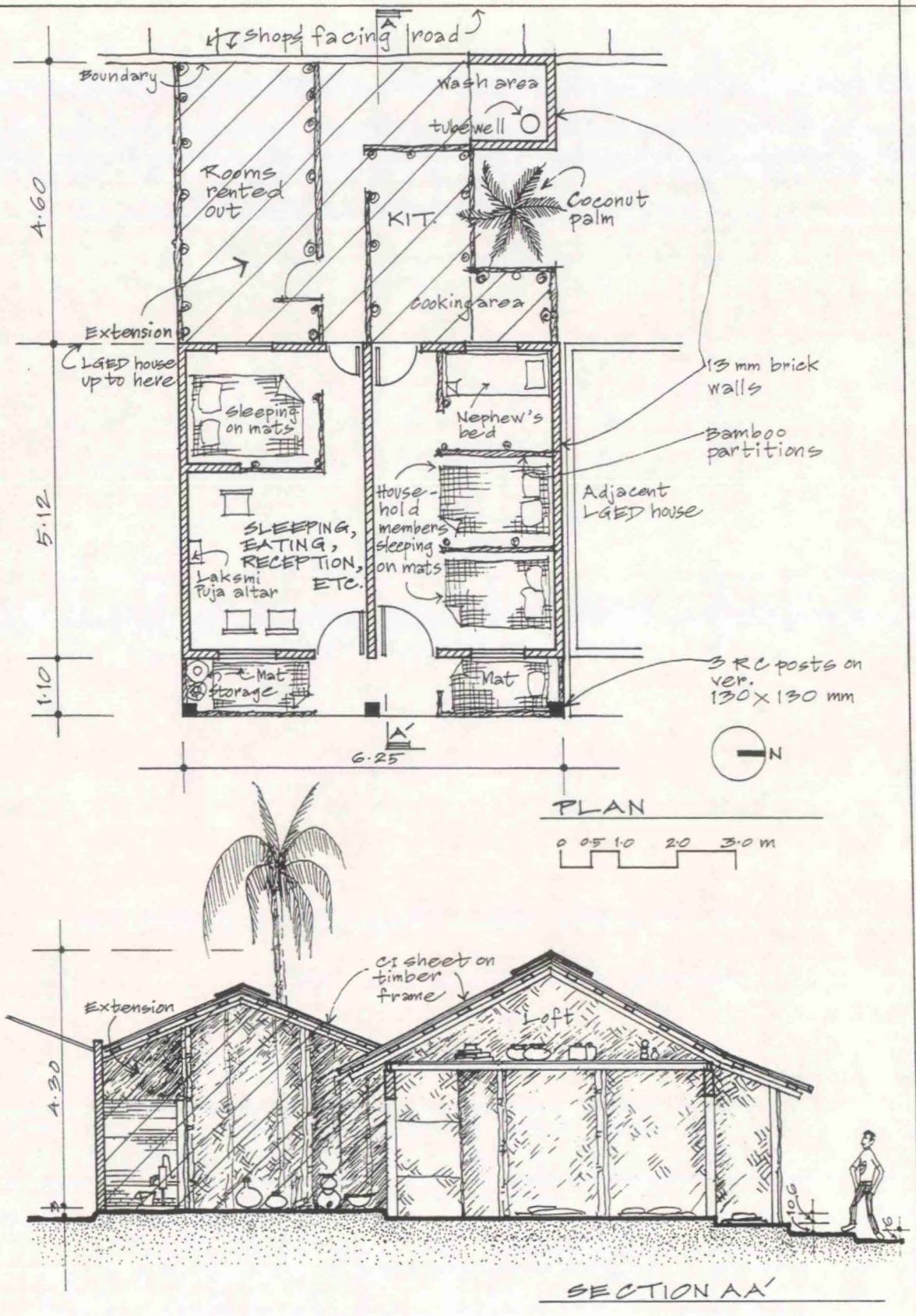
SECTION AA'

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
38	Proshika/gen. loan	Cox's Bazar	Sajeda Begum	1994

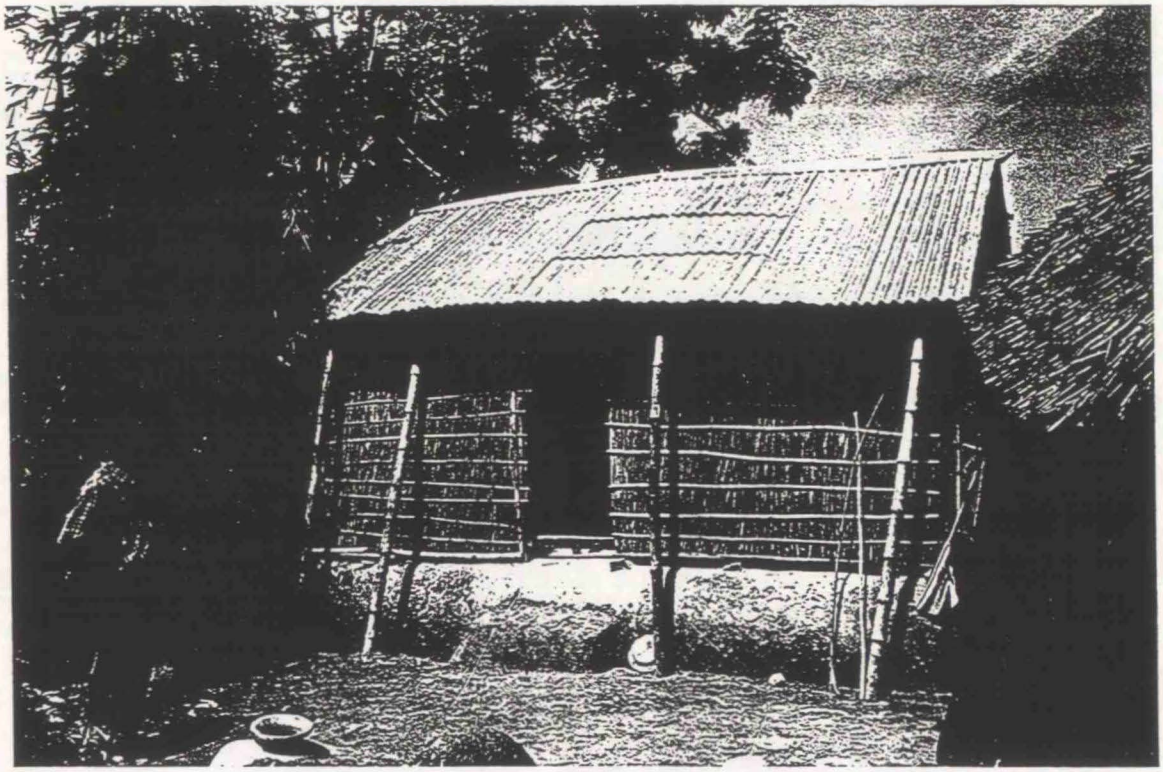


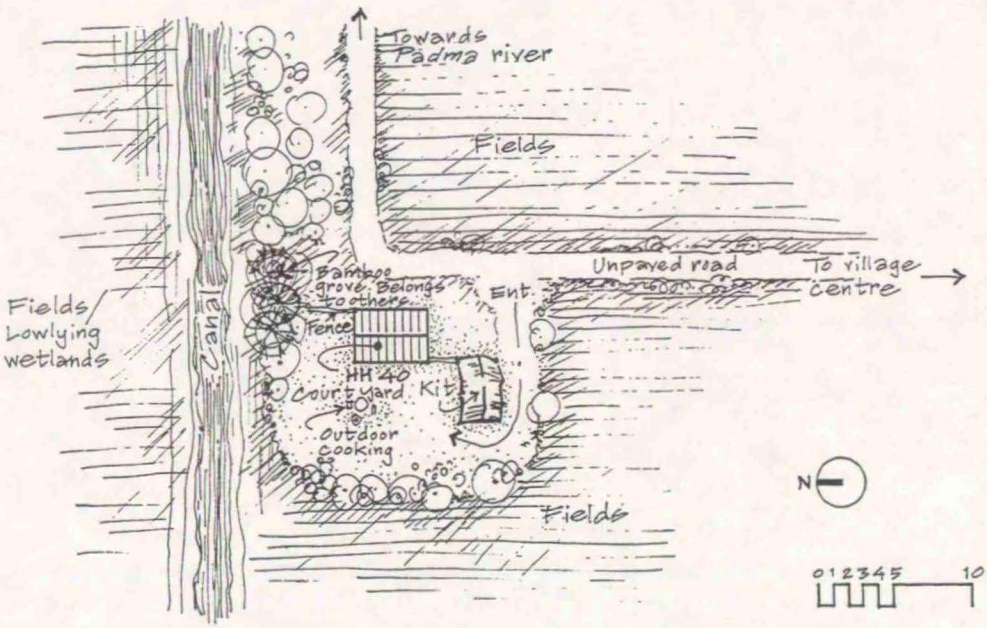
SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
39	LGED	Chittagong	Porimol Kumar Jolodas	1991



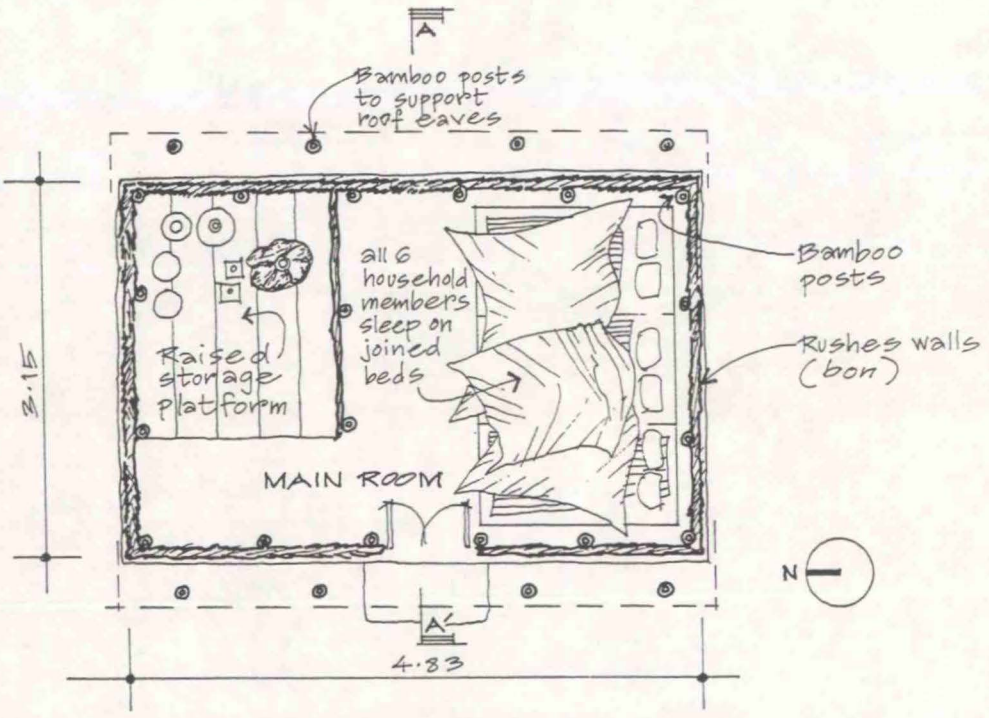
HH	PROGRAMME	LOCATION	RESPONDENT	YR BUILT
39	LGED	Chittagong	Porimol Kumar Jolodas	1991





SITE LAYOUT

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
40	WVB/sold off	Faridpur	Banu Khatun	1989



PLAN

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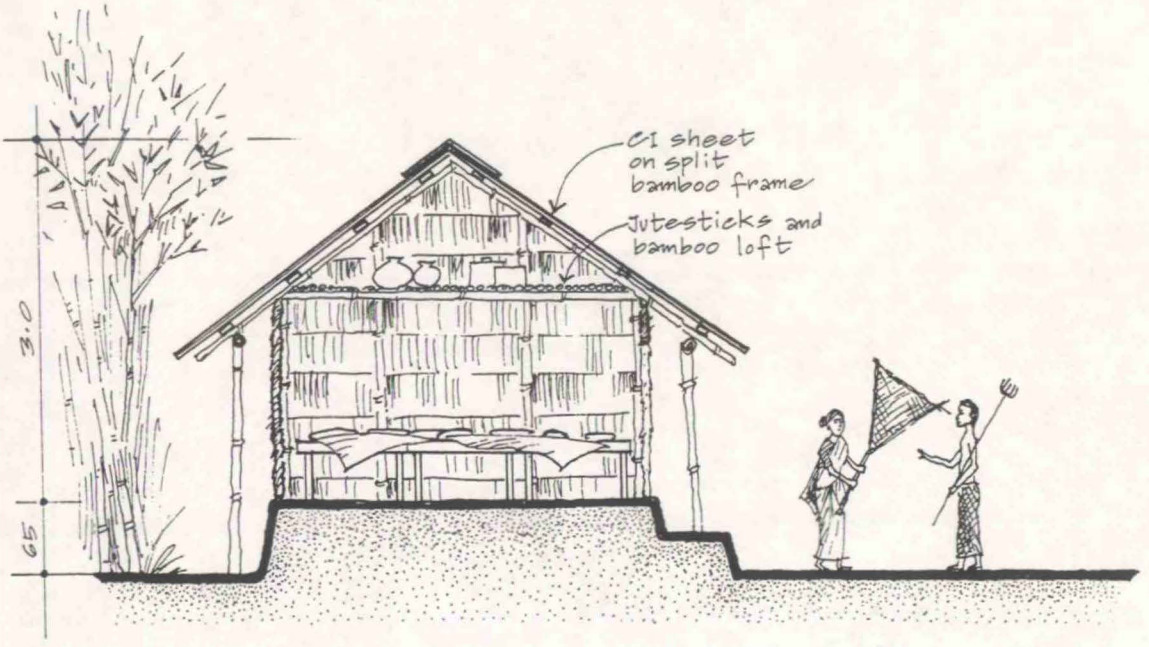

SECTION AA'

HH	PROGRAMME	LOCATION	RESPONDENT	YR. BUILT
40	WVB/sold off	Faridpur	Banu Khatun	1989