

VERNACULAR BUILDINGS IN SUNDARBAN, DINAJPUR DISTRICT : IMPLEMENTING BUILDING FOR SAFETY

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Introduction

Despite large expenditures on designing and constructing improved technologies for low-cost house construction, most rural people in Bangladesh live in traditional houses which are vulnerable to natural hazards as experienced in this tropical region. Unless the low-cost house is provided to them, or credit is available, the poorest families cannot afford even the cheapest imported technology. For such people, help in identifying improvements that make their homes safer but not significantly more expensive is needed.

Providing improved replacement houses after a disaster has not proved either timely or cost effective in terms of increasing the resilience of the most vulnerable groups to future disasters (Hodgson, 1995).

This paper describes a continuing programme to characterise the building types and construction processes in a village in northern Bangladesh. The programme aims to identify the resources (financial, physical and skills) available in the community and to explore how those resources are applied to house building. An output will be to raise awareness among owners of the cost benefits to be derived from safer building techniques as well as the physical protection which better houses give.

Location and geography

Sundarban village sits astride the main highway, midway between Dinajpur and Saidpur. The River Atrai forms the eastern boundary of the predominantly agricultural village.

With a population of 7,000 (1991 census) covering an area of 10.4 sq.km, Sundarban is the largest village in the Union which also bears the name. Literacy rates in 1991 were 34% (male aged more than 7) and 14% for women. The inadequate facilities for education prompted the establishment of a local NGO, Chetonar Dak, in 1991 to organise non-formal education programmes.

The village lies on the edge of the piedmont plains in the north western corner of the country. This relatively raised area is not normally known for flooding and is away from the main cyclone affected areas around the Bay of Bengal. Therefore, it does not have much history of international emergency

relief aid, nor, until recently, any aid at all. However, since 1991 it has been struck by a major flood (September 1991) and two cyclones (September 1995 and April 1996) which have all been as devastating locally as the larger events felt in other places.

This makes the village appropriate for study as it is possible to investigate indigenous solutions to the problems of natural hazards. Also, there is a variety of building types and materials which enables comparison of a large range of options.

Rationale for programme

Illiterate daily labourers seldom have time to access vital information, even if they could read it. This programme provides a volunteer to act as a catalyst for change to encourage enquiry into traditional techniques and promote discussion of appropriate technology improvements. Involvement of the community artisans at all levels is essential, necessitating a working knowledge of the Bangla language.

The field programme started in September of this year and is planned to continue until May 1997 following the suggestions included in *Communicating building for safety* by Dudley and Haaland (1993). Work to date has included wider investigation of construction in Bangladesh and mapping construction types within the village. A start has been made on identifying appropriate media for the dissemination of information.

Dissemination Path

The diagram in Figure 1 outlines the various routes through which safe building information can be disseminated from a specialist organisation such as the Housing & Hazards Group to householders within the paras (sub-villages). One objective of this study is to identify which dissemination route is most effective in Bangladesh.

Village Survey

The Sundarban project started with a survey of present building practice in the village. Using the Thana map as a basis, the paras which together form the village unit have been identified and located (see Figure 2). The physical mapping activities helped to introduce the field worker to residents of all parts of the village and to start gathering anecdotal information. It also provided opportunities to record the common building types and technologies now in use.

Some houses are numbered, apparently as a result of the 1991 census. However, not all retain their numbers and the system used does not seem

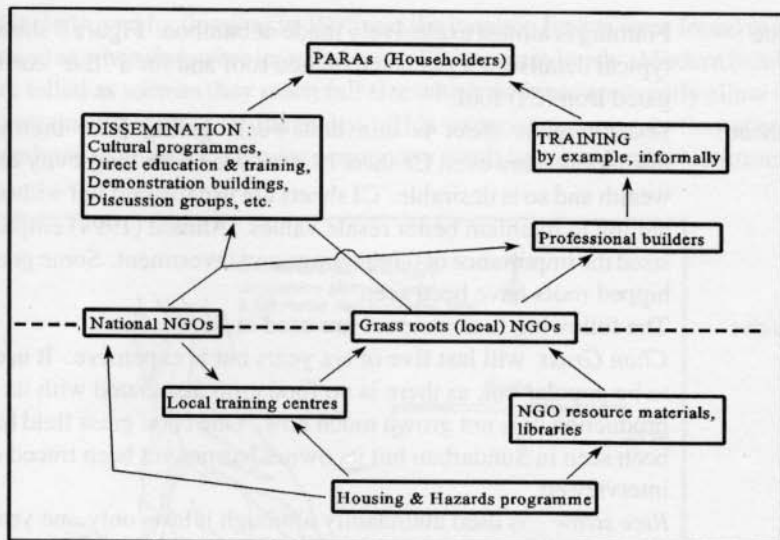


Figure 1 : Illustrating the various paths for disseminating a Building for Safety message

to have been systematic so it has not been used for sampling purposes. Instead, as an initial approach, three paras with the following different social characteristics have been selected for more detailed studies.

Dash Para	Fishermen/Hindu area Large para Frequently flooded (near river) Mainly mud construction
Hari/Roshini Para	Poor Hindu area Bamboo used widely
Vatar Para	Agricultural Muslim area Mainly mud construction

Roof materials and construction

When completed, the study will look at all aspects of house construction practice. The following comments on roof construction and performance have been made by respondents to the initial survey :

- Frame :** Framing is almost exclusively made of bamboo. Figure 3 shows typical details for a pitched thatched roof and for a "flat" corrugated iron (CI) roof.
- CI sheet :** Locally made sheet is thin and weak, giving poor thermal insulation. However, CI sheet is associated with long-evity and wealth and so is desirable. CI sheets are usually laid flat without nailing to maintain better resale values. Ahmed (1994) emphasised the importance of CI sheeting as an investment. Some good hipped roofs have been seen.
- Thatch :** The following four varieties are used in Sundarban:
Chon Grass will last five or six years but is expensive. It used to be popular but, as there is no food crop associated with its production, it is not grown much now. One chon grass field has been seen in Sundarban but its owner has not yet been traced or interviewed.
Rice straw is used abundantly although it lasts only one year. The house-building season comes just after the main harvest and many people use the straw to rethatch annually. Apart from the rapid deterioration, rice straw appears to be a good thatching material according to the criteria of Nick Hall (1988). However, it has many other uses as fodder and as fuel.
Wheat straw is available after the winter harvest and is another popular thatching material. It can last two years and the stiff straight stems give a distinctive layered appearance to roofs. Sugar cane cover is available from nearby plantations. This broad leaf is harder to lay but will last three or four years so its use is becoming more widespread as thatchers become accustomed to it.
- Clay tiles :** Tiles are still in use on some roofs. Tile production has traditionally been a Hindu craft and continued in this predominantly Hindu community until about seven years ago. Tiles are more durable than other roof coverings but their heavy weight soon distorts a typical bamboo frame.

The following anecdote illustrates how traditional materials can last, given the correct conditions. As reflected by its name, which means "beautiful forest", Sundarban village was, a generation or so ago, largely covered by bamboo jungle. In 1972-3 quantities of this mature bamboo were used to reconstruct houses destroyed during the Liberation War. One of those houses

was destroyed by flooding in 1995 and the bamboo beams were found to be as sound as when they were installed some 23 years previously. Modern bamboos are felled as soon as they reach full size which does not apparently allow them to attain this degree of longevity. This experience suggests that allowing bamboos to grow for a longer period may result in more durable construction.

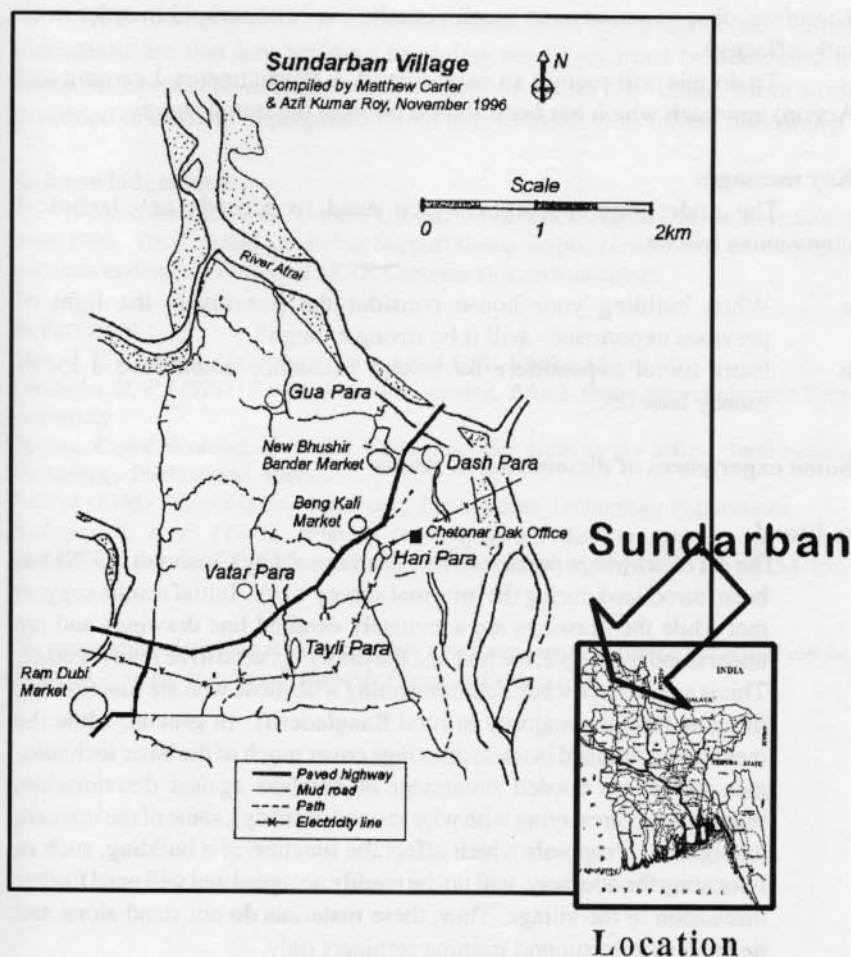


Figure 2 : Location of Sundarban and map of village

Target group for dissemination

There are some professional house builders in Sundarban. However, most low-income houses are built by their owners, often with professional assistance with the roof construction. It appears that men generally do the main construction while women become responsible for maintenance. The survey will be extended to consider the options open to women headed households. Therefore, dissemination must reach virtually every household in order to be fully effective.

To do this will require an extensive PLA (Participatory Learning and Action) approach which has been started through the initial survey.

Key messages

The underlying messages which need to precede any technical innovations will be :

- a. When building your house consider the hazards in the light of previous experience - will it be strong enough?
- b. Extra initial expenditure on hazard resistance could save a lot of money later on.

Some experiences of dissemination media

a. Visual

The set of drawings developed as a teaching aid by Chisholm (1979) has been introduced during the informal survey work. Initial results suggest that while the drawings are adequately detailed line drawings and are understood by people, the text and the drawings need to be read together. This is a drawback when communicating with those who are functionally illiterate (still the majority in rural Bangladesh). In general, while the messages contained in these drawings cover much of the basic technologies which are needed (treatment of bamboo against deterioration, bracing structures, tying with wire instead of string), some of the texts are ambiguous. Proposals which affect the function of a building, such as relocating the doorway, will not be readily accepted and will need further discussion in the village. Thus, these materials do not stand alone and must be used to support training seminars only.

b. Audio

The basic key messages outlined above lend themselves to dissemination via cultural routes. Village functions often include musical recita-

tions and a start has been made on composing a suitable song containing the 'Housing & Hazards' messages. This route of dissemination might be seen as raising awareness among the audience and rendering individuals more receptive to subsequent formal training.

Conclusions

It is too early to draw full conclusions from this programme. Initial indications are that key building for safety messages must be addressed in multi-media form to virtually every household within the village. More work is needed to develop appropriate visual aids to assist with technical training.

Acknowledgements :

The communities of Tiverton, UK and Sundarban, Dinajpur District, have linked since 1990. The Tiverton Sundarban Support Group supports community development activities undertaken by a local NGO, Chetonar Dak, in Sundarban.

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The programme described in this paper has now been completed and a full report can be obtained from the Housing & Hazards Group in Exeter, UK

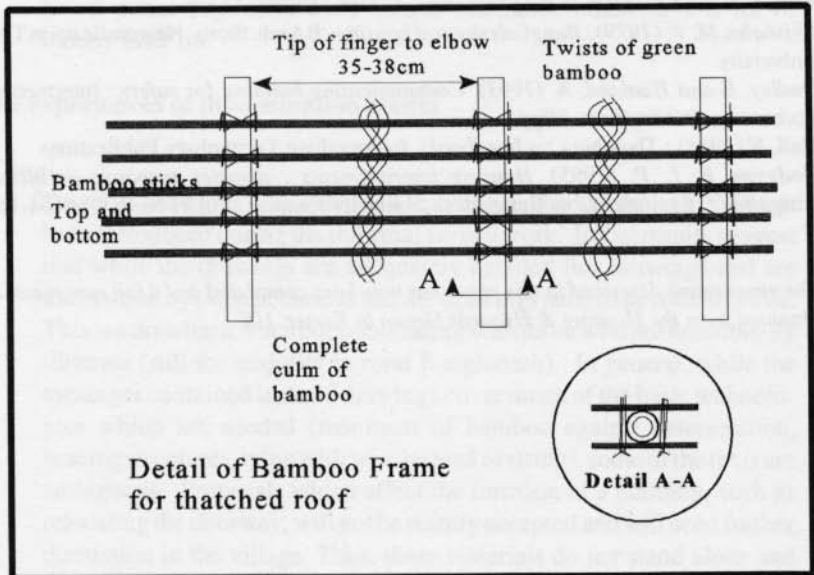
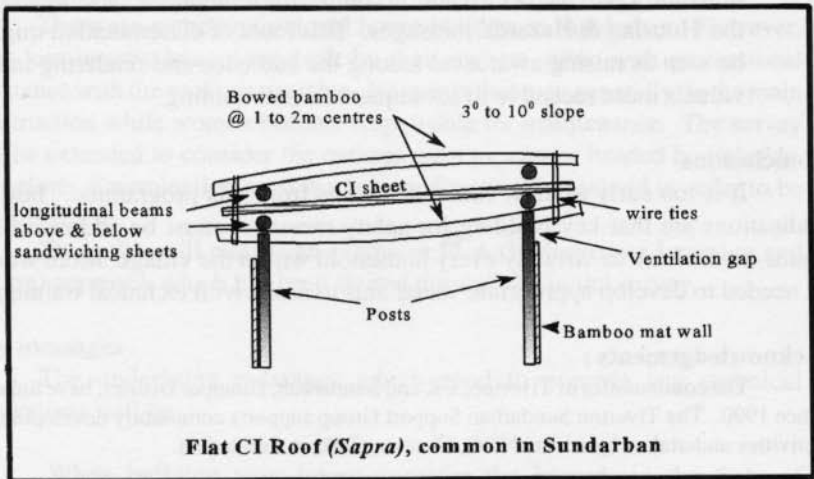


Figure 3 : Some roofing details noted in Sundarban