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PROCEEDINGS OF THE FIRST INTERNATIONAL HOUSING & HAZARDS WORKSHOP TO EXPLORE PRACTICAL BUILDING FOR SAFETY SOLUTIONS DHAKA/BANGLADESH/3-5 DECEMBER 1996

IMPLEMENTING HAZARD-RESISTANT HOUSING

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The Workshop was held at the Bangladesh University of Engineering & Technology (BUET), Dhaka, in association with the Housing & Hazards Group, University of Exeter, UK

About The Workshop Partners :

BUET and Department of Civil Engineering

Bangladesh University of Engineering and Technology (BUET) is the apex institution for engineering education at undergraduate and graduate level studies in Bangladesh. Every year about 600 students graduate from BUET in various engineering disciplines.

The Department of Civil Engineering, the largest department of the University, offers both undergraduate and postgraduate programs in civil engineering and currently has 1025 students in enrollment. There are highly qualified faculty members specializing in structural engineering, geotechnical engineering, transportation engineering and environmen-tal engineering disciplines. The current faculty strength of 58 includes 46 having doctoral degrees.

The University of Exeter and the Housing & Hazards Group

The University of Exeter, located in the South West of England, continues to be one of the most popular universities in the UK. It enjoys an excellent reputation for both research and teaching across its six faculties. The University has around 7,400 students of which about 1,700 are postgraduates. The University of Exeter fosters wide-ranging interests and expertise across the various disciplines

The interdisciplinary Housing & Hazards Group includes academics and non-academics with an interest in improving the safety of the built environment in developing communities. It is based within the Earth Resources Centre which specialises in environmental programmes.

Workshop Organising Committee

BUET:

Prof. J. R. Choudhury
Prof. Md. Abdur Rouf
Dr. M. A. Jalil
Dr. Zakaria Ahmed
Dr. A. B. M. Badruzzaman
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Acknowledgements

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Acknowledgement is due to Dr. Nizamuddin Ahmed of Dept. of Architecture, BUET, Mr. Ashraful Hassan of Grameen Bank, the Chief Engineer, LGED, Dr. John Merefield and Dr. Mike Heath of the Earth Resources Centre, University of Exeter. We owe a special debt of gratitude to Prof. J R Choudhury who piloted the arrangements through uncertain times, to Dr. Salek M Seraj for his attention to the administrative details and to Dr. Robert Hodgson for getting the international participants together.

We are indebted to all the honorable guests who got the workshop off to such a good start with their kind and encouraging remarks. The then Head of the Civil Engineering Department, Prof. M. Azadur Rahman welcomed all the participants to which Dr. Robert Hodgson replied on behalf of the international guests. The Vice Chancellor of BUET, Prof. Iqbal Mahmud, introduced the Chief Guest, the Honorable State Minister for Housing and Public Works of the People's Republic of Bangladesh, Mr. Afsaruddin Ahmed Khan. Dr. Salek M Seraj proposed a vote of thanks to all inaugural speakers which we can echo here.

The workshop could not have taken place without its sponsors. It is a pleasure to record the contributions of the UK Aid Management Office who enabled the overseas keynote speakers to be present, the Local Government Engineering Department and Grameen Bank who hosted the field visit, Design Development Consultants Ltd for sponsoring the administration and Prof Iqbal Mahmud, Vice Chancellor of BUET, who hosted the excellent farewell dinner.

Despite their busy schedules, Dr. Ian Davis and Dr. Andrew Maskrey gave their valuable time to share a wealth of experience. For this, all who heard them will be forever grateful.

Lastly (or is it firstly?), the event could not have taken place without the participants. Thank you to all who came and participated so enthusiastically. We hope the following pages will be a testament to all contributors, some of whom are shown on page vi, captured during the field visit.

A Section of the Workshop Participants

INTRODUCTION

Objectives & programme

These papers tell a story. That story is of many people's efforts to bring more secure, hazard-resistant homes to the rural poor of Bangladesh. Further, the discussion points the way for the development of those efforts as the International Decade for Natural Disaster Reduction draws to a close.

This workshop aimed at "improving the dissemination of information to all in developing countries who need better homes to resist hazards". Perhaps this was an ambitious aim; nonetheless, a lot of valuable experience was teased from Bangladeshi participants which, cross-fertilised with the observations of the international keynote speakers, provides important lessons not only for Bangladesh but also in the wider arena of developing building for safety programmes. Of particular note are the Participant's joint recommendations painstakingly put together at the conclusion of the Workshop. These proposed a series of steps which will be vital in almost any country that intends to eradicate inadequate housing.

In format, the workshop consisted of two days of formal presentation and discussions with an intervening day of field visits. A range of building projects was inspected, including the National House Building Research Centre's trial structures, village developments in Manikganj by the Local Government Engineers Department (LGED) and self-build programme using materials and finance obtained as loans through the Grameen Bank programmes at Hararimpur, near Aricha Ghat. The itinerary took hardier participants to remote areas and impressed upon them the sociological as well as the technical dimensions of vulnerability.

Some editing notes

In editing these proceedings we have rearranged the papers into two sections. The first section includes contributions which discussed primarily technical issues and the second covers the more sociological aspects of the dissemination and implementation processes. Although discussion was allowed after each contribution, the results of those discussions have been collected and presented as appropriate at the conclusion of each section.

We think that this provides a more coherent record of the complex deliberations and we hope that no contributor is offended by this liberty.

This workshop took place at a time of some political uncertainty in

Bangladesh. Some of the intended overseas participants were therefore unable to attend. In consequence, a few of the papers included in this volume were read and discussed in the absence of their authors. Their inclusion is justified in that they address topics relevant to the workshop's theme and thus contribute to the overall discussion. On the same basis, we would apologise to one or two participants who provided most expert and informative contributions but which were outside the strict scope of this volume.

ISSUES & OBSERVATIONS

Although the Workshop had not been themed in any particular way, certain perspectives emerged as it progressed. These notes attempt to summarise the three days of sometimes heated debate.

Technology vs. Sociology

Considerable discussion erupted at one stage over the definition or desirability of "Hazard-resistance" with some participants maintaining that houses should be proof against all expected hazards. A wide variety of NGO house designs is currently being provided to low-income families; the LGED paper by Nurul Islam outlines the features of many. Near the top of the scale, for example, the LGED model houses had been designed to withstand all but the most ferocious of storms. The question was raised as to whether this height of technology would be widely understood and replicable at village level. Some participants felt that such sophisticated technologies could become too prescriptive and hence might restrict the choices available to homeowners.

Later contributions by Ian Davis and Andrew Maskrey favoured an incremental approach to improving house resistance rather than a one-step complete solution. Talking with the Grameen Bank's clients in Hararimpur reinforced the point that few of those more vulnerable people could afford more than a very short step upwards and that it is important that each step must be well understood before progressing further.

The point was also well made by several contributors that sociological and cultural factors must be incorporated into designs. This can best be done by involving closely those who will use the building in its design. Sometimes, this may mean that safety design features, such as the positioning of openings, have to be set aside to ensure that the function of the dwelling is maintained. An alternative is to engage in closer communication with the owner/designer of the house and involve him and/or her in all aspects of its realisation.

Credit, loans & insurance

There is no doubt that most people in rural Bangladesh want stronger houses; lack of finance prevents them from achieving this. The LGED house models, for example, can cost three to five times as much as many can afford, according to Dipal Barua's figures. His contribution on the work of the Grameen Bank reminded us of the importance of making funding available in an appropriate and sympathetic way. Women, Grameen Bank have found, are

good repayers as they have the long term good of the home in their care. Housing & Hazard's preliminary findings from North Bengal, presented by Matt Carter, confirm that while this is true in the long term, it is the men who do the initial building so there is still some work to be done on the dynamics of the loan process.

One aspect of the disaster-recovery process not covered is the role of insurance. This factor, so common in developed economies, is largely absent in rural Bangladesh and deserves closer consideration. It is possible that well-designed insurance schemes could both assist in the recovery process after disasters and also reduce uncertainties for the insured, thereby allowing the rural poor more freedom of action.

Emergency shelter

It will clearly be a long time before everyone in Bangladesh has a hazard-resistant home. What can be done in the meantime? David Sorrell has one answer and provided a well-considered exposition of his plans for production and deployment of the Permatent. This simple device, about to start trials with Enfants du Monde in Bangladesh, provides an easily transported shelter that can be deployed rapidly from regional stores. It clearly has an important place in well-developed disaster preparation plans but discussion centred on the problems that may arise should it be deployed in areas which have not been prepared for its use and where the short-term nature of its deployment is not understood. This is an important innovation which will be followed with much interest.

There is experience from other places (Ian Davis) that much of the recovery process occurs unaided by people reusing materials scattered by the storm, flood or earthquake. Ian's view was that the best assistance should consist of adding materials to that process, preferably with some instruction to improve the reassembly. Again, this requires good communications with the affected community. Given those good contacts, the ideal would seem to be a combination of rapidly deployed temporary shelter plus assistance with long-term reconstruction.

The nature of rural housing in Bangladesh

It was useful to be reminded of the scale of the job in hand. Lewis & Chisholm's paper points out that over 80% of Bangladesh's houses are in rural areas and that three quarters of those are of either kutcha (non masonry) or temporary construction. They estimated that simple strengthening improvements to those types of house would cost around 5% extra on the construction cost and drew attention to the point, repeated by Hodgson & Carter, that many rural homes are self-built. That makes the process of disseminating information much more complex since it needs to reach virtually every family in the country.

The effects of hazards on houses in Bangladesh

Bangladesh's principal hazards (wind and flood) are well known if not always well understood. The keynote address by Prof. J R Choudhury, an international expert on hazard resistant design, gave an excellent overview of these and made the important distinction between structures which have been engineered to withstand expected hazards and the much larger group of "non-engineered" buildings. This important contribution also draws attention to the earthquake risk which is often neglected in Bangladesh. It is conveniently forgotten that most of Dhaka was destroyed by a tremor only 100 years ago! Lightweight non-engineered Bangladeshi houses are not likely to pose much of a threat in an earthquake but there is a growing number of what might be termed non-engineered pucca-style houses with brick walls and more substantial roofs which present a risk to their occupants. Dhaka, in particular, is at risk because of the extensive poor-quality earth filling which has been necessary to make up ground levels around the city.

There is often a danger that non-governmental organisations can work in isolation, relearning solutions which others have already discovered. It appears from the LGED contribution that their programme is seeking to coordinate a range of activities, at least from a technical perspective, which is to be welcomed.

There is a need for better understanding of the performances of traditional technologies and of the behaviour of vernacular architecture when subjected to natural hazards. Taufiqal Anwar's paper presents the results of research which points the way to some basic but effective strengthening of the normally unbraced kutcha house frames. Likewise, Iftekhar Ahmed's presentation on alternative technologies for low-cost houses presented much basic information and provoked valuable discussion of the many factors involved, both technical and non-technical.

Retrofitting

The contribution by Fernandez et al. was not presented in person. It nevertheless raises important points about preparedness and describes nicely a process of identifying and upgrading buildings at risk before the event. Prof. J R Choudhury had already commented on the importance of such a process in helping to break the cycle of destruction and rebuild in a hazard-prone area.

The international perspective

The workshop was most fortunate in having the opportunity to hear two very experienced and well-respected international key-note speakers. Ian Davis set the scene, introducing the Building for Safety series of booklets recently published by Intermediate Technology with funding from the UK government. He suggested that the post-disaster period presents good opportunities for introducing innovation and emphasised the importance of experiential learning. Most people do not learn thoroughly in a class-room situation, he said. Building for safety training was best introduced as part of wider community development or preparedness programmes.

Andrew Maskrey's experiences from Peru and other parts of Latin America supported Ian's observations. Andrew added the point that he had never found any need to develop new technology in his work; everything needed for a Building for Safety programme could be found in a manual he had found dating from 1956. What was needed was implementation - and that was more complicated than at first appeared. It was particularly important to recognise the aspirations of the home owner. Failure to do this would result in poor replication of the chosen innovations.

Dissemination lessons

The Latin American lesson was that a loose approach to innovation is more likely to be long lasting. The people involved must make the decisions for themselves, albeit with assistance. That implies a lengthy consultation process but the initial time spent is well repaid later. Andrew reminded us that the expert needs to become accessible to the user, not the other way around. "Never forget", he also said, "that building activities may not be the most important in the calendar. Agricultural production is usually seen as more crucial to survival in marginal societies. Building for Safety must therefore fit in where it can".

In this vein, Matt Carter's experiences in North Bengal will be instructive. He described the preliminary results of his adoption of a version of this loose approach. He had identified potential dissemination paths and started to consider awareness-raising activities. It was too soon to report conclusions but this project appeared to show great promise.

One more of Andrew's pithy phrases bears repeating. Emphasising that the developmental process is always incremental and that those who aim initially for perfection may easily achieve nothing, he left with us all the apposite phrase:

"PERFECT IS THE ENEMY OF GOOD"

Finally, the Recommendations

These are reproduced at the end of this volume and speak for themselves. They are the product of a two hour well-debated discussion and represent the contributions of virtually all participants. After all that work, we cannot afford to wait another 40 years as has the Latin American manual found by Andrew Maskrey.

Our challenge is to implement them!

Robert Hodgson, Salek M Seraj and J R Choudhury, Editors