Disaster preparedness and rehabilitation in Binh Tri Thien Province , Vietnam
Sử bảo vệ chống thâm-hoa thiên-nhiên ở tỉnh Bình Trị Thiên , Việt Nam

VIE /85/019

CHUYỂN GIAO KỸ THUẬT XÂY DỰNG NHÀ CHỐNG GIÓ BÃO
DEMONSTRATION OF STORM RESISTANT BUILDING TECHNIQUES

16

# Session I Workshops

June 1989

# Overall presentation

Development Workshop

Viện Thiết Kế Nhà Ở - Công Trình Công Cộng, Hànội
Institute For Housing and Public Building Design

Xí Nghiệp Thiết Kế Khảo Sát Xây Dựng, Huế
Institute For Building Investigation and Design

GRET

# Project VIE/85/019 Disaster preparedness and rehabilitation in Binh Tri Thien province

**Financing :** *UNDP*
**Executing agency :** *UNCHS-Habitat*, Nairobi, KENYA

## Sub-Project N°3 Demonstration of storm resistant building techniques

**Vietnamese counterparts :** *Institute for Housing and Public Building Design* (IHPBD) Hanoi, VIETNAM
*Institute for Building Investigation and Design* (IBID) Hué, VIETNAM

**Subcontractor :** *GRET*, 213, rue Lafayette, 75010 Paris, FRANCE
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1 US $ = 4 000 Dongs (June 1989)

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**Report**

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**Others documents**

Cyclone resistant construction, basic information, DW/GRET, 1989, 106 p. (E)
Cyclone resistant construction, manuals, DW/GRET, 1989, 47 p. (E)
Indigenous building in central Vietnam, DW/GRET, 1989, 48 p. (E)
Demonstration building : Loc Dien primary school, DW/GRET, 1989, 24 p. (E & V)
10 key cyclone resistant building principles, DW/GRET, 1989, 4 p. (E & V)

Loc Dien primary school : results, IBID/DW/GRET, 1989, 16 p. (E & V)
Action plan, IBID/DW/GRET, 1989, 9 p. (E & V)
Results of working groups - Session I , IBID/DW/GRET, 1989, 60 p. (E & V)

" My husband builds our house ", video film VHS-PAL, 17 ', IBID/DW/GRET, 1989 (V)

(E) English, (V) Vietnamese

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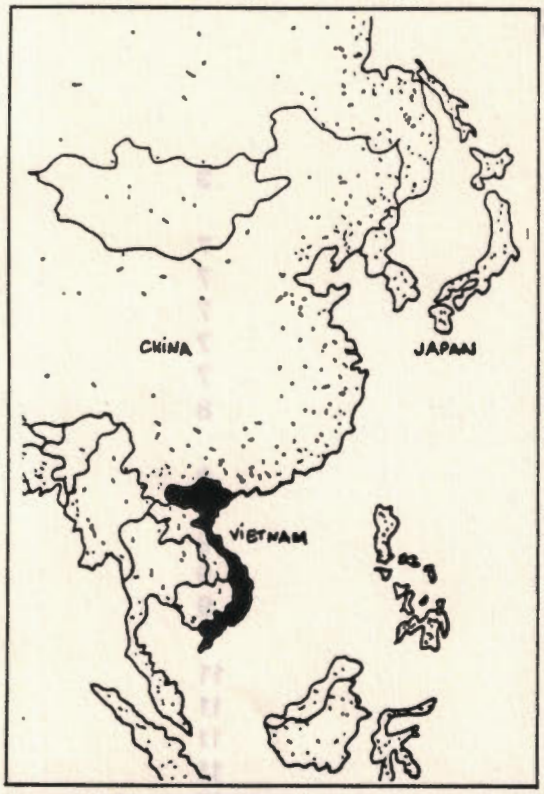
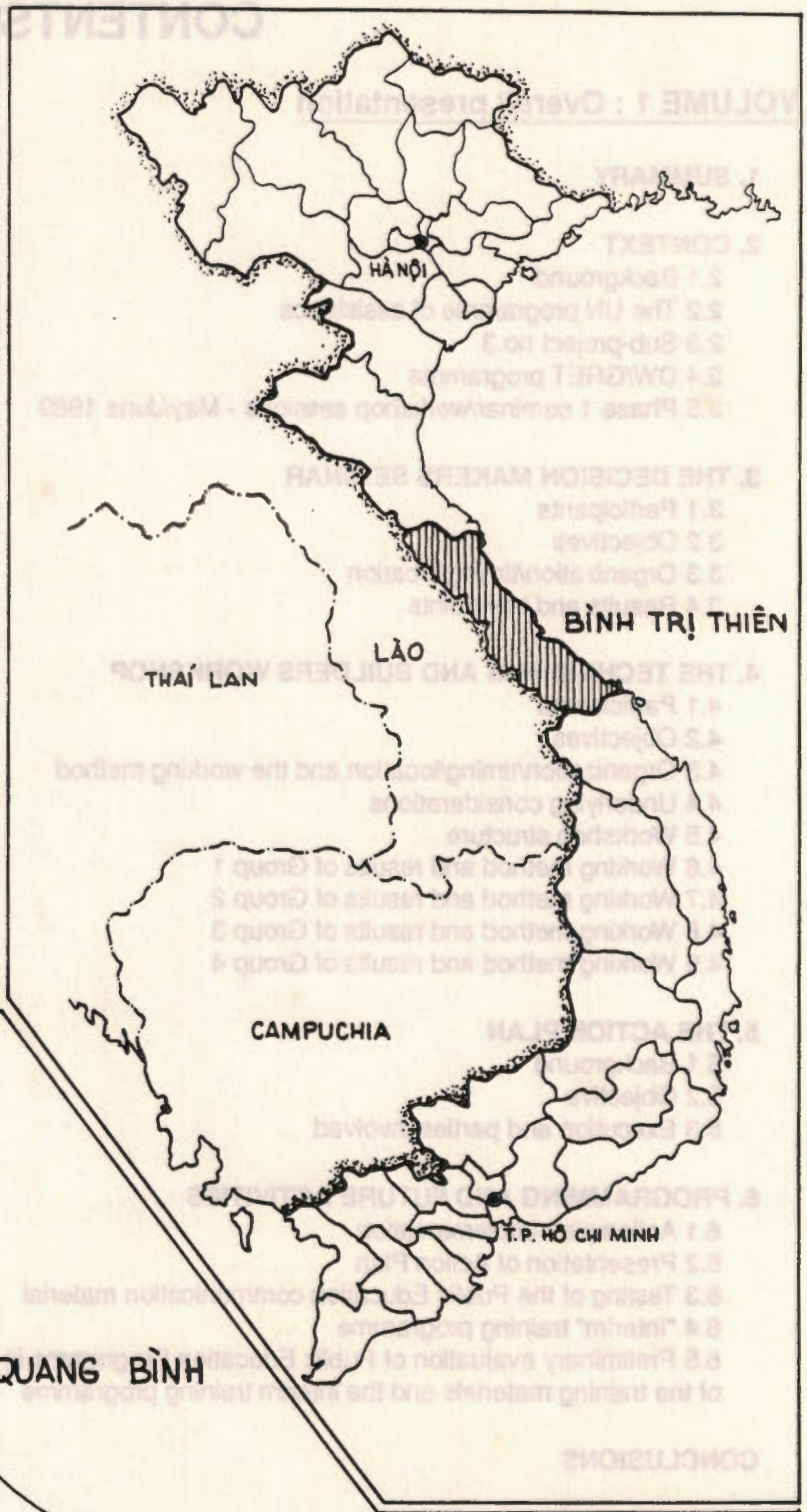
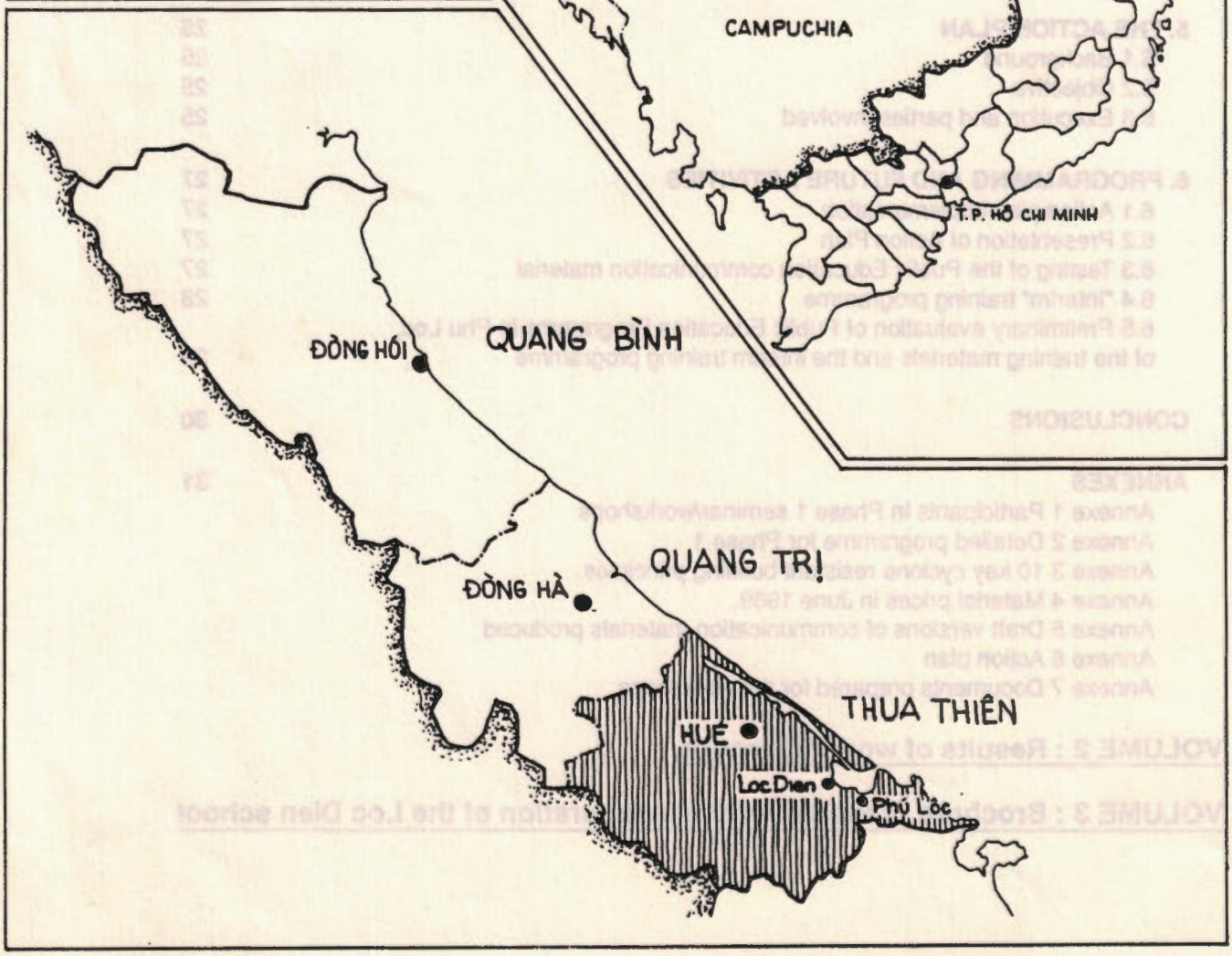



SINCE JULY 1st 1989, BINH TRI THIEN PROVINCE HAS BEEN DIVIDED INTO THREE NEW PROVINCES :

- QUANG BINH
- QUANG TRI
- THUA THIEN



# 1. SUMMARY

## 1.1 The Phase 1 Workshops : Timing

The Phase 1 activities have been run from the 22 May to the 17 June, a period which was preceded by preparation work by DW/GRET in Hanoi and Hué. During this Workshop period a moderate cyclone (no.2) hit the province, slowing work down. Nevertheless, the programme is running to the agreed schedule.

## 1.2 Results

The Phase 1 Workshops have established a good working relationship between DW/GRET and our counterparts in Hué. IHPBD Staff from Hanoi only participated in the latter part of the workshops, and we regret that they were unable to join the first important introductory sessions. IHPBD should play an important role in disseminating the results and action of the project to other Provinces in Vietnam in the future.

A seminar has been run in Hué for 26 Policy Makers over 4 days, and a joint workshop for 23 technicians and 25 builders lasting three and a half weeks has been completed in Phu Loc District, 40 kms south from Hué.

At the end of the Phase 1 Workshop period, the results are appreciable:

- Developing out of the work of the decision makers seminar and the technicians/builders workshop, an Action Plan has been drawn up and agreed, which defines the structure and actions necessary for disseminating information about CRC to the public and to local builders.

- At the end of the workshop, the participants have produced comprehensive documents on (i) the characteristics of housing in the region and the cyclone resistant techniques which can be promoted; (ii) the cost of construction and the extra cost for different building types that is incurred by improving cyclone resistance; and (iii) the most suitable methods of communicating information to the public, technicians and, to a lesser extent, decision makers.

- At Loc Dien village, a new primary school has been built by the participants as a demonstration of storm resistant building techniques.

- A video film has been produced "My husband builds our house", with the help of Hué TV, to advertise the role of the District adviser for CRC. Draft versions of posters and leaflets have also been prepared.

## 1.3 Observations

### 1.3.1 Capacity to train

Moving into the next phase, IBID is becoming increasingly responsible for the organization and training work in the project. The IBID staff have worked extremely hard during the 1st Workshop. This level of commitment is essential for the future success of the project. The training capacity of the IBID staff is also encouraging, and is the basis on which it is now possible to move to a stage where IBID becomes responsible for the majority of the training work.

### 1.3.2 Financial control

Careful control of costs when demonstrating cyclone resistant building is important, so that the extra cost for strengthening the building is clearly distinguished. There has been some difficulty in firmly establishing this idea. Real building costs need to go on being monitored carefully in future demonstration buildings, so that the public can see where the extra cost is incurred.

### 1.3.3 The demonstration building

Building the school has been a positive process, encouraging much debate about techniques and giving practical experience. Direct involvement by the participants in the design would increase the demonstrative value of the exercise, and this is taken into account in planning the next stages.
Site organization was sometimes poor, and needs in future to be carefully controlled, since it directly effects the quality of workmanship being achieved and the resulting cyclone resistance of the building.

## 1.4 Programming and factors affecting the programme

### 1.4.1 The sub-division of Binh Tri Thien province

Binh Tri Thien province has, as of July 1st, been divided into three new provinces (Quang Binh, Quang Tri and Thua Thien). This has caused some concern about the institutional setup for the project. Assurances have been given by Mr Dien, overall director of the project, that there will be no difficulty. The IBID in Hué remains the key Vietnam counterpart organization, and is thus responsible for any liaison with the new Institutes (or equivalent) in the provinces of Quang Binh and Quang Tri. The division has clarified the planning of the programme, so that complete cycle of training and communication activities need to take place in each province.

### 1.4.2 Workshop duration

The Phase 1 workshops occupied the IBID and the participants for nearly four weeks. This was probably too long, and in future a shorter period, not exceeding three weeks, and preferably closer to two, would seem more realistic.

### 1.4.3 Phasing the construction of the demonstration building

Building the Loc Dien school at the same time as running all the other activities of the workshop imposed a considerable strain, not eased by the arrival of Cyclone No. 2. The design of demonstration buildings will in future be done by participants of training workshops, and built subsequently by participants in CRC workshops for builders. It would be preferable to lengthen the construction period, and to allow it to carry on after the main workshop period has finished, provided that the IBID Unit of CRC and the trained technicians running the workshop continue to (a) monitor the quality of work, and (b) run bi-weekly sessions to comment on the objectives and the quality of the work being done.

### 1.4.4 The Interim November Training Workshop

To develop the programme, it is now important that IBID run a training programme for technicians on their own, without the presence of DW/GRET staff. This workshop, for training the technicians in the new Quang Tri province, will take place between November the 6th and 18th. A member of the DW/GRET team will come to Vietnam almost immediately after the training programme to evaluate the work with the experience of the November Workshop, and the test of the Public Education Programme which also starts in early November in Phu Loc.

IBID should inform DW/GRET of the number, name and profession of the November Workshop participants and training team, so that a budget can be established for their per-diems, and approval given for payment by UNCHS Nairobi.

The evaluation period in late November with DW/GRET staff in Vietnam represents an additional input, and is in part a response to the expressed desire of our Vietnamese counterparts that the project should advance more rapidly.

Table 4 shows the revised programme of inputs. There is no alteration to th key points concerning action which is to be taken in the next 10 months (July 1989 to April 1990), which were agreed between Mr Vien of IBID and Mr Norton of DW/GRET on June 16th 1989 in Phu loc.

## 1.5 Comments

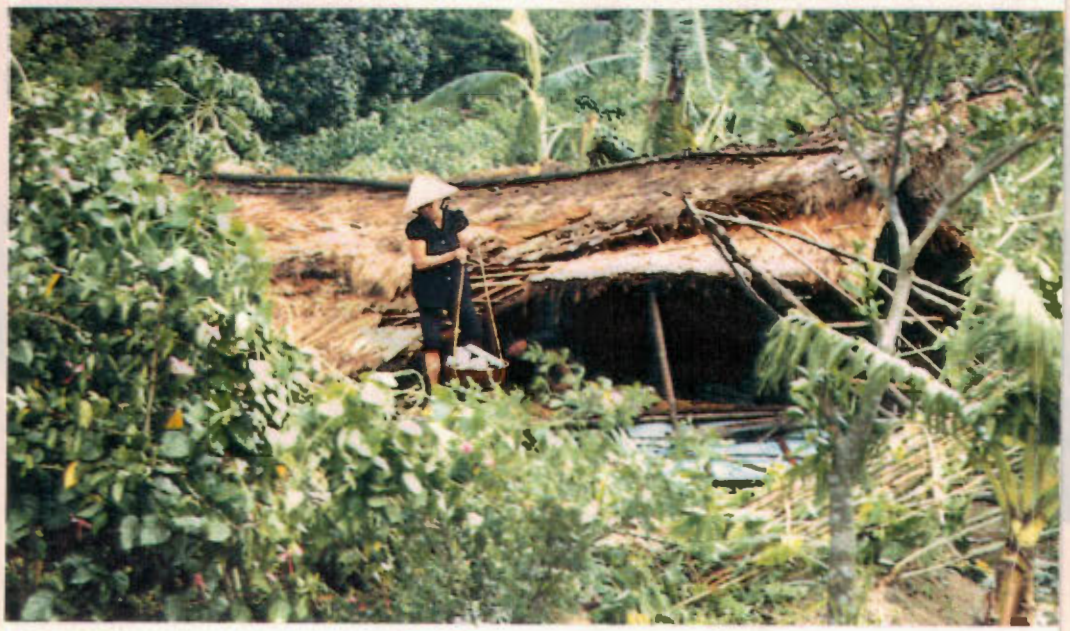
The energy and willingness of our Vietnamese counterparts in the operation of the programme so far has been commendable. From the results of a questionnaire handed out at the end of the 1st Workshop period, there has also been a very positive response to the workshop method, the documentation provided by DW/GRET, and the activities and subjects which have been dealt with.

It is nevertheless important to recognize that financial difficulties impose a constraint on the future operation of a programme of this sort, demanding both time and expenses from the Vietnamese. This means that in the long run, a budget needs to be allocated for the operation of the Action Plan (training, media production, monitoring) by the authorities of each province, and in the context of Disaster Preparedness in each province.

*PHU LOC*

***Effects of Cyclone n°2***

***(24 May 1989)***



***In PHU LOC...***

***...In DANANG***

# 2. CONTEXT

## 2.1 Background

In October 1985 two very strong typhoons struck the province of Binh Tri Thien, central Vietnam. The authorities reported very severe and widespread damage: 875 persons dead, 49,000 houses destroyed, 230,000 houses damaged, 2,600 classrooms destroyed or damaged, 6 hospitals and 250 health centres damaged. One of these typhoons was strong enough to be rated in the 50 to 100 year typhoon category, but almost annually, lesser typhoons cause extensive losses in the area. Losses are significant not only because of loss of life and injury, but also because of the cost of replacing damaged buildings.

## 2.2 The UN programme of assistance

After the 1985 typhoons, Binh Tri Thien province and the government of Vietnam requested assistance from the UNDP. A proposal was made by the UNCHS to provide assistance to the building sector, as part of a three project package to the region. The overall package comprised establishing a typhoon early warning system (Sub-Project No.1), establishing a communication system to warn the authorities and the population of the advent of a typhoon (Sub-Project No.2), and designing and implementing a programme to demonstrate storm resistant building techniques (Sub-Project No.3).

## 2.3 Sub-project no.3

The overall objectives of Sub-Project No. 3 are to define and initiate the process by which identified simple and low cost methods for improving the typhoon resistance of houses and small community buildings can be disseminated and integrated into current building practice in Binh Tri Thien province, and particularly amongst local builders and home owners.

The hypothesis which formed the basis of the project suggests that whilst technical know-how is available amongst qualified technicians in the Government institutions, this knowledge of suitable storm-resistant building techniques is not available to individual builders in the province. The vulnerability of buildings is also increasing as people move away from traditional building techniques using tried and tested methods and materials, and build instead "transition" houses with a mixture of exogenous and traditional techniques and materials. Lack of money, lack of the appropriate technical knowledge, and in some cases the use of poor materials, contribute particularly to the vulnerability of the "transition" house.

The project is therefore concerned with the exchange of information between technicians and builders, and the communication of techniques to the people in the province most directly concerned with domestic building. At the same time, the project aims to raise institutional awareness of the steps that need to be taken to develop public awareness of storm-resistant building techniques.

## 2.4 DW/GRET programme

### 2.4.1 Overall approach

To meet the objectives outlined above, Development Workshop and GRET, at the invitation of UNCHS, are organizing a programme in Binh Tri Thien involving a series of seminar/workshops for decision makers, building technicians, and local builders; the workshop activities include the construction of demonstration buildings, and the development of communication material aimed at the general public, at technicians and at decision-makers in Vietnam.

The programme has set out to work with provincial decision makers, construction technicians and local builders, all of whom are concerned, albeit in different ways, with the improvement of understanding about cyclone resistant construction methods and with their dissemination to the general public and their application in public building.

To achieve this, the programme is organizing workshops and seminars for the various parties involved, and practical actions including the construction of demonstration buildings and the production of communication material.

### 2.4.2 Timing and inputs

The original programme started with a preliminary field analysis mission in January 1989. Two phases of workshop sessions, each one including seminar/workshops for decision-makers, technicians and builders were scheduled for May 1989 and February 1990.

The preliminary field analysis mission was undertaken in January /February 1989.

The start of the Phase 1 seminar/workshops, scheduled to begin on 15 May 1989, was pushed back by one week to the 22 May at the request of UNCHS, to enable Bob Hardy, UNCHS, to participate in the presentations at the end of the Phase 1 seminar/workshop period and to see at first-hand the results of this phase. The organization and execution of the Phase 1 seminar/workshops has required the presence of two members of the DW/GRET team, John Norton and Guillaume Chantry, between the 10th May and the 22nd June 1989.

### 2.4.3 Amendments to schedule and duration of programme

The overall programme is still running to the schedule agreed during the first mission, despite the fact that a moderately severe cyclone (no. 2) hit Binh Tri Thien in the first week of the Phase 1 seminar/workshops, stopping all activities for one day. In the light of experience gained during the Phase 1 seminar/workshop, however, and the current restructuring of Binh Tri Thien province into three provinces, an additional "interim" training programme will be organized in November 1989, i.e. between the Phase 1 and Phase 2 seminar/workshops of the original programme.

The Phase 1 seminar/workshops have resulted in the development of an Action Plan for achieving the objectives of the project, and the implications of this plan on the overall duration of the current project will be discussed in Sections 5 and 6.

## 2.5 Phase 1 seminar/workshop sessions - May/June 1989

### 2.5.1 Terms of Reference and overall objectives

The Terms of Reference for the 1st Workshop Phase have been defined as follow:

1. To organize a seminar for policy makers in Binh Tri Thien province.
2. To organize theoretical and practical workshops for both technicians and builders in the southern part of Binh Tri Thien province.

The overall objectives of these seminar/workshops have been as follow:

1. To define training methods adapted to the technicians and the builders of the region.
2. To examine the value of traditional and current cyclone resistant building techniques and the degree to which they are in use.
3. To evaluate the ways in which techniques can be communicated to the project's different target groups.
4. To set out the basis for a provincial action plan for informing people about cyclone resistant building techniques.

During this phase a demonstration two-classroom primary school was to be built by the workshop participants.

### 2.5.2 Timing

Two members of the DW/GRET team, John Norton and Guillaume Chantry, were present in Binh Tri Thien between 10th May and 22nd June 1989. After an initial two-day period devoted to the organization of the workshops and working methods, the workshops ran over the next four weeks.

# 3. THE DECISION MAKERS SEMINAR

## 3.1 Participants

The decision makers seminar brought together the representatives from the provincial and district People's committees, the three Sub-Project directors (see paragraph 2.2 above), the heads of various departments in Binh Tri Thien province concerned with construction, and directors from the Health Department and Hué TV. (See Annexe 1 for a list of participants).

## 3.2 Objectives

The objectives of the Seminar were four-fold:

* to associate the decision makers with the workshop process and to invite their participation through comments and advice;

* to review the problems of typhoons and the possibilities of achieving typhoon resistant building construction;

* to review the local experience of large scale information dissemination;

* to elaborate the outline of a plan of action to disseminate information about cyclone resistant building methods.

## 3.3 Organization/timing/location

The decision makers seminar was organized at the start of Phase 1 ( 22nd and 23rd of May), and the seminar was divided into two parts.

(a) The first two days took place in Hué at the IBID, and were taken up by presentations and discussion, promoting an exchange of information related to the four objectives of the seminar. This period was then followed, ten days later, by -

(b) visits to the technicians workshop, the demonstration building site, and the village of Loc Dien, all in Phu Loc District.

The decision makers also participated in the final presentations by the technicians and builders workshop members.

## 3.4 Results and key points

The visits of the second part of the seminar allowed the decision makers to see at first hand and comment on the process and progress of the Technicians and Builders workshop and the construction of the school.

They were also able to inspect damage to thatched housing in Loc Dien caused by Typhoon No 2, which struck the province on 24th May and caused slight damage, and no loss of life. This served to highlight the real difficulty of bringing practical assistance to the very poor and thus raised again the option of providing places of refuge for those whose houses are unlikely to resist a major cyclone.

A number of key points emerged from the comments and exchanges which took place during the seminar. They are summarised below.

(a) Because the number of architects and engineers amongst the participants was quite high, some of the debate focussed directly on technical problems of building and practical solutions which participants felt could be encouraged. Poor detailing and quality were cited as frequent weaknesses in much public and domestic building.

(b) At the same time, it was unanimously seen that economic difficulty is the key constraint for improving cyclone resistance in buildings. Faced with the extreme poverty of many people living in the area, the use of public facilities - schools etc - as refuges during storms was put forward as one important option, not necessarily well-perceived by all the participants.

(c) A variety of media options for communicating information about cyclone resistant construction were suggested, most of which already exist, including radio and TV, and the use of local newspaper, mobile video shows and megaphone announcements.

(d) The experience of the Health Department in informing the public about health measures provided a more dynamic model for working in the districts and communities: the health department train volunteers from the community in communication techniques and health knowledge. The volunteers are given an information pack containing posters, flip charts and models, enabling them to explain about health to villagers either in the home or in small groups. From this presentation, it became clear, that even though the problems of building (and cyclones) are perceived differently to those of health and hygiene, it is nevertheless important that a similar good technical information network is created, linking in this case the Building Institute at Provincial level to advisers at district and commune level. This conclusion formed the basis for outlining an Action Plan for Demonstrating Storm Resistant Building Techniques, the content of which is presented in Annexe 6.

***Visit of the decision makers in LOC DIEN, after the cyclone***

# 4. THE TECHNICIANS AND BUILDERS WORKSHOP

## 4.1 Participants

The Technicians and Builders workshop was designed to bring together 25 technicians and 25 builders (see Annexe 1 for a list of participants) in one combined workshop.

## 4.2 Objectives

The objectives of this workshop were four-fold, as follows:

* to develop training methods adapted to the technicians and the builders of the region;
* to examine the usefulness and cost of traditional and current cyclone resistant building techniques and the degree to which they are in use;
* to evaluate the ways in which techniques can be communicated to the project's different target groups;
* to construct a small public building to demonstrate cyclone resistant building techniques adapted to the local context.

## 4.3 Organization/timing/location and the working method

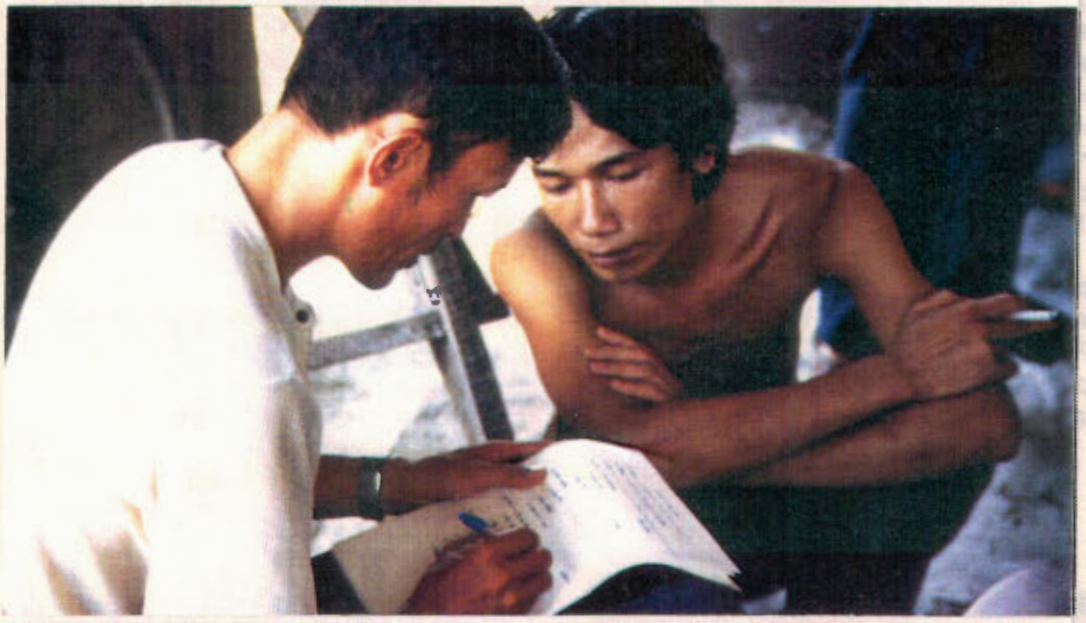
The workshop lasted three and a half weeks from the 24th May to the 17th June 1989. During this time, work has been divided between -
(a) general course work, to explain concepts and theories to all the participants;
(b) periods for field enquiries and case studies;
(c) small group working sessions on specific aspects of the programme; the construction of the demonstration building;
(d) the production of dossiers and communication material in Vietnamese which summarise and present the work that has been undertaken.

The detailed programme for the Phase 1 workshop is reproduced in Annexe 2 .
Apart from some field enquiries in Hué city, the majority of the work for the technicians/builders workshop took place in Phu Loc District, the most southernmost District of the Binh Tri Thien province, and thus the product reflects above all the situation in this District which comprises over 130,000 inhabitants living mainly on a narrow coastal plain and engaged in fishing, farming and for a few the timber industry.

*Participants in the workshop*

## Working methods

*General course work...*



*...field enquiries...*

*...production of dossiers*

## 4.4 Underlying considerations

The following considerations provided a strong theme throughout the various workshop sessions and are therefore presented at this point, i.e. before detailed consideration of the results.

(a) The general course work included the presentation and discussion of "Ten Key Principles" for cyclone resistant building design. In subsequent work sessions these key principles were repeatedly returned to as -
- the basis for the analysis of local building practices and costs,
- a central part of the message that needed to be transmitted to the population, and
- the underlying principles used in the design and construction of the demonstration building.

These "Ten Key Principles" were produced in Vietnamese and English at the start of the programme and are appended at Annexe 3.

(b) It was also important to situate the limitations to what can realistically be expected in cyclone-resistant construction. To build houses to resist the catastrophic "100 year cyclone" such as hit Binh Tri Thien Province in 1985 would be extremely expensive. Efforts and investment have been made to ensure that public buildings linked to providing emergency services or refuge should be capable of resisting a cyclone rated as "extreme" (Saffir-Simpson). But much fewer houses should be damaged by the moderate cyclones which more frequently hit the coast of Binh Tri Thien province, than is at present the case.

## 4.5 Workshop structure

During the technicians/builders workshop, apart from the general course work periods, the participants were divided into four groups, each responsible for a different aspect of the programme:

Group 1: Analysis of the effects of cyclones on buildings in the Province - examination of the key points of weakness and strength.

Group 2: Study of the economic impact of technical innovations which can improve the cyclone resistance of buildings.

Group 3: Evaluation of the ways in which ideas and information can be communicated to the project's various target groups.

Group 4: Supervision and construction of the Primary School Demonstration Building at Loc Dien.

At the start of the technicians/builders workshop, an information sheet was presented for each of the four groups in English and Vietnamese, which outlined in greater detail the work to be done. These can be found in Annexe 4.

This four-group structure provides a convenient way to present the workshop results. These results are fully presented in SESSION I WORKSHOPS - Volume 2

## Survey of houses in PHU LOC District

*Traditional*

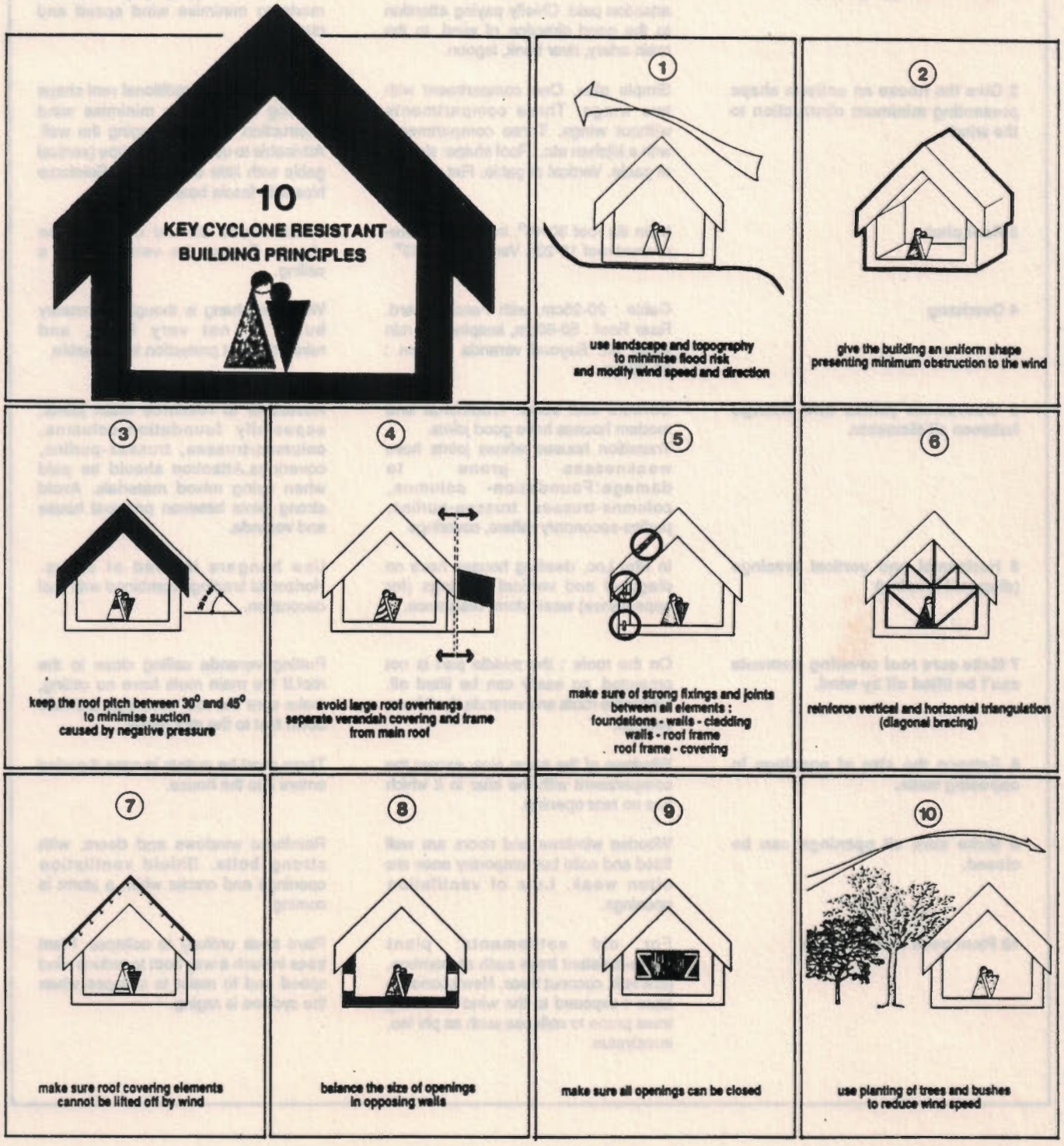
*Transition*

*"Binh Tri Thien modern"*

## 4.6 Working method and results of Group 1

Group 1, comprising 10 participants, surveyed the different types of buildings in Phu Loc District, and analyzed the effects of cyclones on each building element, material and joint.

Based on this survey, they then identified the key local features which are or have been used to achieve cyclone resistance, and assessed the possibility of applying these and other key cyclone resistant building techniques to the contemporary situation of Phu Loc and southern Binh Tri Thien province.




*The 10 key cyclone resistant building principles*

## Table 1 : Evaluation of houses according to the key cyclone resistant principles

| KEY PRINCIPLES | BUILDING STATUS | PROPOSALS |
|---|---|---|
| **1 Make use of typography** | Conditions of selection limited - little attention paid. Chiefly paying attention to the good direction of wind, to the main artery, river bank, lagoon. | Fullest use of typography should be made to minimise wind speed and direction. |
| **2 Give the house an uniform shape presenting minimum obstruction to the wind** | Simple plan. One compartment with two wings. Three compartments without wings. Three compartments with a kitchen etc...Roof shape: sloping at gable. Vertical at gable. Flat roof. | Advisable to use traditional roof shape sloping at gable to minimise wind obstruction, not overhanging the wall. Advisable to use transition type (vertical gable with little overhangs). Reinforce hips with fascia boards etc. |
| **3 Roof pitch** | Main tile roof 30-45°. Iron sheet, fibre-cement roof 15-20°. Veranda : 10-15°. | Small house should not use iron sheets. Protect the veranda; use a ceiling. |
| **4 Overhang** | Gable : 20-25cm, with Fascia Board. Rear Roof : 50-60cm, keeping the rain water off. Beyond veranda column : 20-30 cm. | When overhang is thought necessary but it is not very large, and reinforcement protection is advisable. |
| **5 Guarantee joints and fixings between all elements.** | Durable and solid. Traditional and modern houses have good joints. Transition houses whose joints have weaknesses prone to damage:Foundation- columns, columns-trusses, trusses-purlins, purlins-secondary rafters, coverings. | Advisable to reinforce main joints, especially foundation-columns, columns-trusses, trusses-purlins, coverings.Attention should be paid when using mixed materials. Avoid strong joints between principal house and veranda. |
| **6 Horizontal and vertical bracings (diagonal bracing)** | In Phu Loc, dwelling houses have no diagonal and vertical bracings (for appearance) weak storm-resistance. | Use hangars instead of struts. Horizontal bracings combined with roof decoration. |
| **7 Make sure roof covering elements can't be lifted off by wind.** | On the roofs : the middle part is not protected, so easily can be lifted off. Under the roofs and veranda don't have ceilings. | Putting veranda ceiling close to the roof.If the main roofs have no ceiling, make sure the roof coverings are held down fast to the roof frame. |
| **8 Balance the size of openings in opposing walls.** | Windows of the same size, except the compartment with the altar in it which has no rear opening. | There must be outlets in case the wind enters into the house. |
| **9 Make sure all openings can be closed.** | Wooden windows and doors are well fitted and solid but temporary ones are often weak. Lots of ventilation openings. | Reinforce windows and doors, with strong bolts. Shield ventilation openings and cracks when a storm is coming. |
| **10 Plant trees as windbreak** | For old settlements: plant storm-resistant trees such as bamboo, jack fruit, coconut trees. New economic zone : exposed to the wind or having trees prone to collapse such as phi lao, eucalyptus. | Plant trees unlikely to collapse. Plant trees in such a way both to reduce wind speed and to resist to collapse when the cyclone is raging. |

***Source : IBID/DW/GRET June 1989***

The key results of group 1 were as follows.

(a) The group confirmed the original typology concerning traditional, "transition" and so-called "Binh Tri Thien modern" housing. At the same time included both in the traditional and the transition categories are those houses which are lived in by the very poor (for example, the majority of fishing families in Loc Dien). These are essentially roofed with thatch and walled with thatch and insubstantial wattle and daub. The synthesis of surveys produced eight different building types designated by the materials they use, but which still fall into the three main building types.

(b) Three traditional (i.e. with many vertical supporting columns) house forms were surveyed. Of these,
- the two which use heavy timber columns and mortise and tenon joints give good storm resistance, but are prohibitively expensive, whilst
- the third, which uses different materials - bamboo and thatch with tied joints - is cheap but often too frail to resist the effect of strong winds.

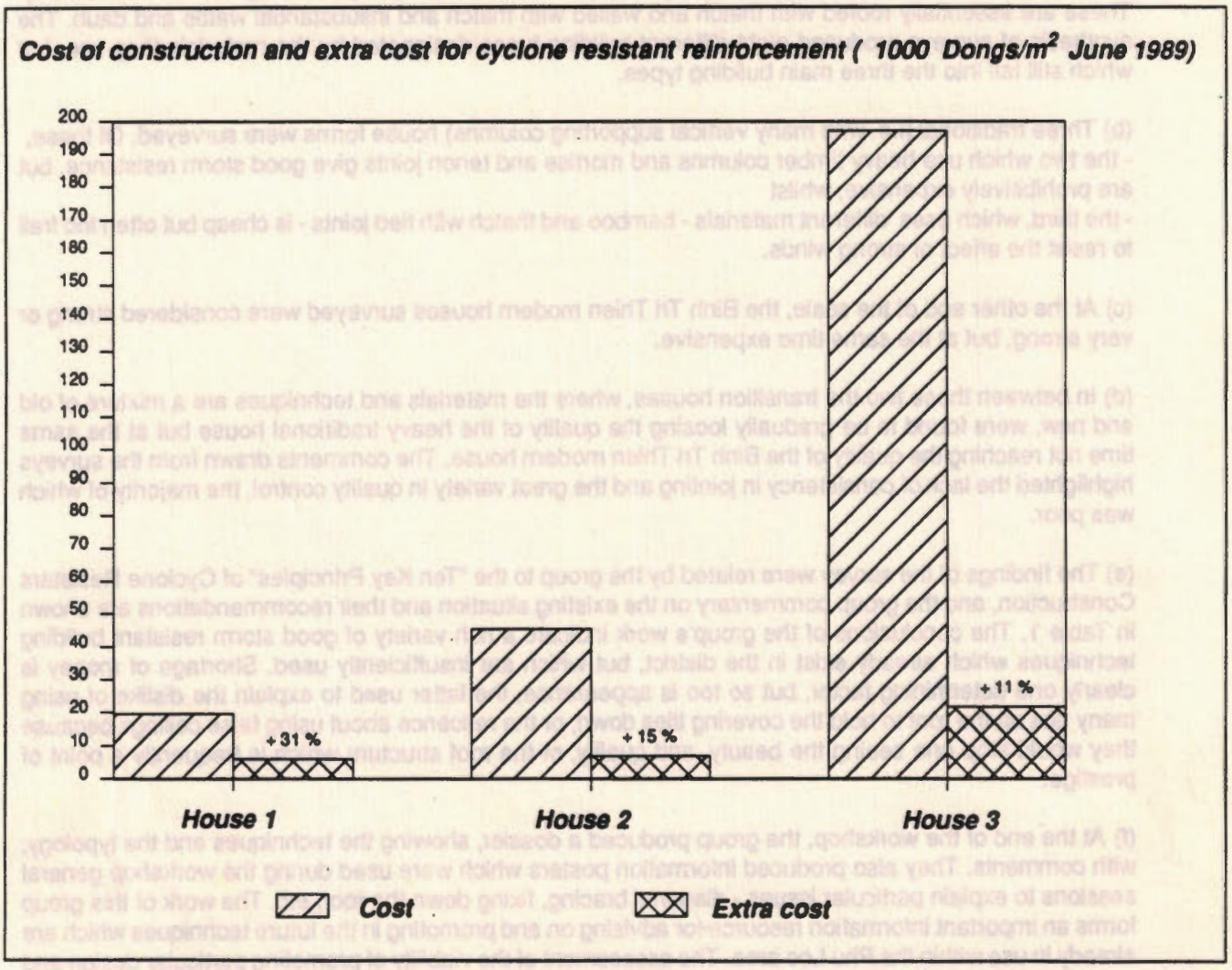
(c) At the other end of the scale, the Binh Tri Thien modern houses surveyed were considered strong or very strong, but at the same time expensive.

(d) In between these two the transition houses, where the materials and techniques are a mixture of old and new, were found to be gradually loosing the quality of the heavy traditional house but at the same time not reaching the quality of the Binh Tri Thien modern house. The comments drawn from the surveys highlighted the lack of consistency in jointing and the great variety in quality control, the majority of which was poor.

(e) The findings of the survey were related by the group to the "Ten Key Principles" of Cyclone Resistant Construction, and the group commentary on the existing situation and their recommendations are shown in Table 1. The conclusions of the group's work indicate a rich variety of good storm resistant building techniques which already exist in the district, but which are insufficiently used. Shortage of money is clearly one determining factor, but so too is appearance, the latter used to explain the dislike of using many ribs on the roof to hold the covering tiles down, or the reticence about using false ceilings because they would stop one seeing the beauty, and quality, of the roof structure which is frequently a point of prestige.

(f) At the end of the workshop, the group produced a dossier, showing the techniques and the typology, with comments. They also produced information posters which were used during the workshop general sessions to explain particular issues - diagonal bracing, fixing down the roof, etc. The work of this group forms an important information resource for advising on and promoting in the future techniques which are already in use within the Phu Loc area. The assessment of the viability of promoting particular design and structural features in the building of new houses was also related directly to the work of Group 2.

## Table 2 : Cost of construction and extra cost for reinforcement




1 Thatched roof, bamboo wattle, timber frame, earth floor, area built = 58 $m^2$
(family income 40 000 D/month)

2 Tiled roof, timber walls, earth floor, area built = 48 $m^2$
(family income 60 000 D/month)

3 Tiled roof, cement block walls, cement floor, concrete verandha, area built = 70 $m^2$
(family income 100 000 D/month)

The diagramme shows the cost for 1 $m^2$ of construction and the extra cost for 1 $m^2$ of reinforcement which helps to improve its cyclone resistant ability .

*Source : IBID/DW/GRET June 1989*

## 4.7 Working method and results of Group 2

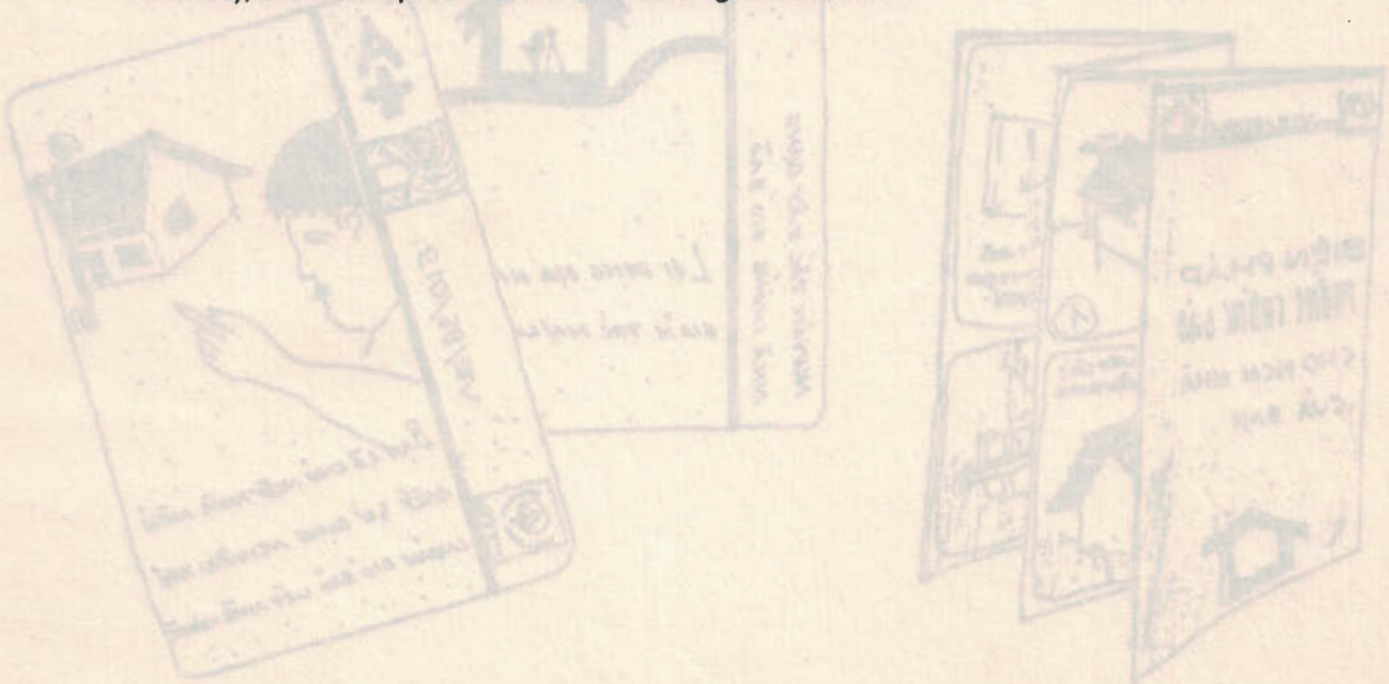
Group 2, with seven participants, studied the costs of all the different building materials used in the southern part of Binh Tri Thien province, and specifically Hué and Phu Loc. (See Annexe 4 for the material prices in June 1989). They went on to evaluate the cost of construction for each part (foundations, walls, openings etc..) of the variety of building types surveyed. They then proceeded to calculate the extra cost involved in making the different building types cyclone resistant, thus giving an indication of the proportionate additional cost for each type. With Group 1, after working out the extra cost that would be involved in making the surveyed houses cyclone resistant, the group returned to the house occupants to inform them of their findings.

The results of the work of the group were of three-fold interest.

(a) Firstly, the idea of analyzing costs in such detail appeared to be completely new, and gave rise to a great deal of debate in the final presentation, sometimes quite heated, since few people were ready to agree on the validity of the results. Whilst shortage of money is clearly seen as a key limiting factor in improving cyclone resistance, the usefulness of quantifying what the real extra cost is was not fully appreciated by all the participants.

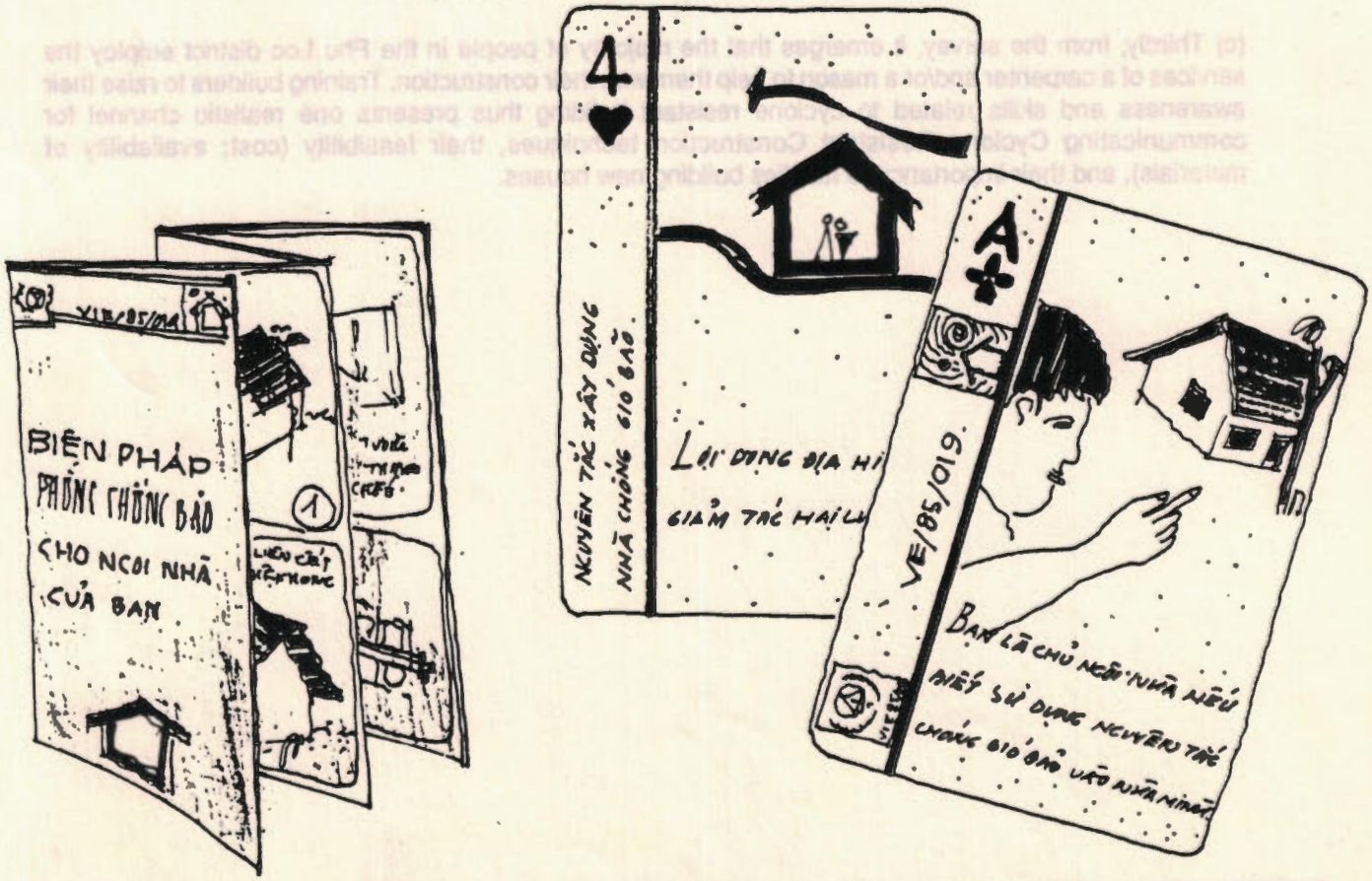
(b) Secondly, Table 2 below shows the results of surveys on typical houses in Phu Loc indicating the relative economic viability of achieving a good degree of cyclone resistance in proportion to the basic cost of the building:
- for the cheapest and weakest of the buildings (built with a thatched roof, timber frame, bamboo wattle and earth floor), cyclone resistant features add 31% to the basic cost;
- making the average transition house (with a tiled roof, timber walls and an earth floor) more cyclone resistant adds 15% extra to the cost;
- the weaker of the typical Binh Tri Thien modern houses (with tiled roof, cement block walls, cement floor and concrete verandah) only requires an extra investment of 11%.
These figures should help to support the premise that as investment in the house increases (and expected durability), not only does the need to protect the investment increase, but so too does the economic viability of doing so. (For example, taking the trouble to carefully tie down the roof to avoid losing the tiles). This is particularly important in the design and construction of small scale public buildings. It equally highlights the limitations of really achieving storm resistance in the cheaper but weaker buildings, where the possible policy of providing refuges emerges as a more realistic option.

(c) Thirdly, from the survey, it emerges that the majority of people in the Phu Loc district employ the services of a carpenter and/or a mason to help them with their construction. Training builders to raise their awareness and skills related to cyclone resistant building thus presents one realistic channel for communicating Cyclone Resistant Construction techniques, their feasibility (cost; availability of materials), and their importance to families building new houses.



## Table 3 : Means of communication

| *Media:* | *Method:* | *Target:* | *Message* |
|---|---|---|---|
| Television | Film show | Technician | Inform about action plan |
| | Lectures | Policy | Inform on action |
| | News | | Announce about cyclone |
| Video | Film | Public | Inform about building adviser |
| Video(slide) | | Technicians | Content of workshop |
| Radio | | Public | Inform about building adviser |
| | | | 10 key principles |
| | | | Cyclone arrival/action |
| Loudspeaker | | Public | Inform about building adviser |
| | | | Cyclone information/action |
| Megaphone | Car | Public | As loudspeaker |
| | | | Announce video session |
| Newspaper | Article | Technician | 10 key principles |
| | | Policy | |
| | Advert. | Limited | Cyclone action |
| | | Public | |
| Leaflet | Handout | Public | 10 key principles/action |
| Poster | | Public | 10 key principles |
| Games | Cards | Public | 10 key principles |
| | Dice game | | |



## 4.8 Working method and results of Group 3

Group 3, with 9 members, analyzed the various available ways that information could be communicated to the different target groups - policy makers, technicians, builders and the general public - concerned with the project. On the basis of this analysis, the Group then developed the draft versions of several ideas for communication.

The starting point was to look at techniques for communication that have been used elsewhere - by the Health Department in Hué, by international and Vietnamese organizations which have produced manuals and/or films for disaster resistant construction. Examples were provided in a dossier at the start of the workshop. These helped clarify some of the possibilities. The participants tested one of the manuals "Will your house stand up" (Intertect) on ten houses, where points are scored to rate the resistance of the house and the action.

The key results of this group's work are as follows.

(a) The participants identified 21 available communication methods, and defined to which of the target groups they were best suited, and for communicating what type of information. (For example, Phu Loc district has 11 mobile video projection sets, so that every commune in the district (there are 27) sees three showings a week, reaching about 150 people each time.) The theme of communication to different target groups was conceptually probably the most difficult, requiring the participants to consider something that had hitherto not been their concern nor responsibility.

(b) Of these 21 methods they selected ten to be developed in the context of the project. These are shown in Table 3.

(c) The selection is strongly biased towards the public. The participants had difficulty in developing the idea of communicating to the policy makers. Towards the public (and this includes the builders) they have three messages:
1. Inform about the 10 key principles of Cyclone Resistant Construction.
2. Inform about last minute action to protect the house when the cyclone is coming.
3. Inform the public that the Adviser for Cyclone resistant construction is available in the district.

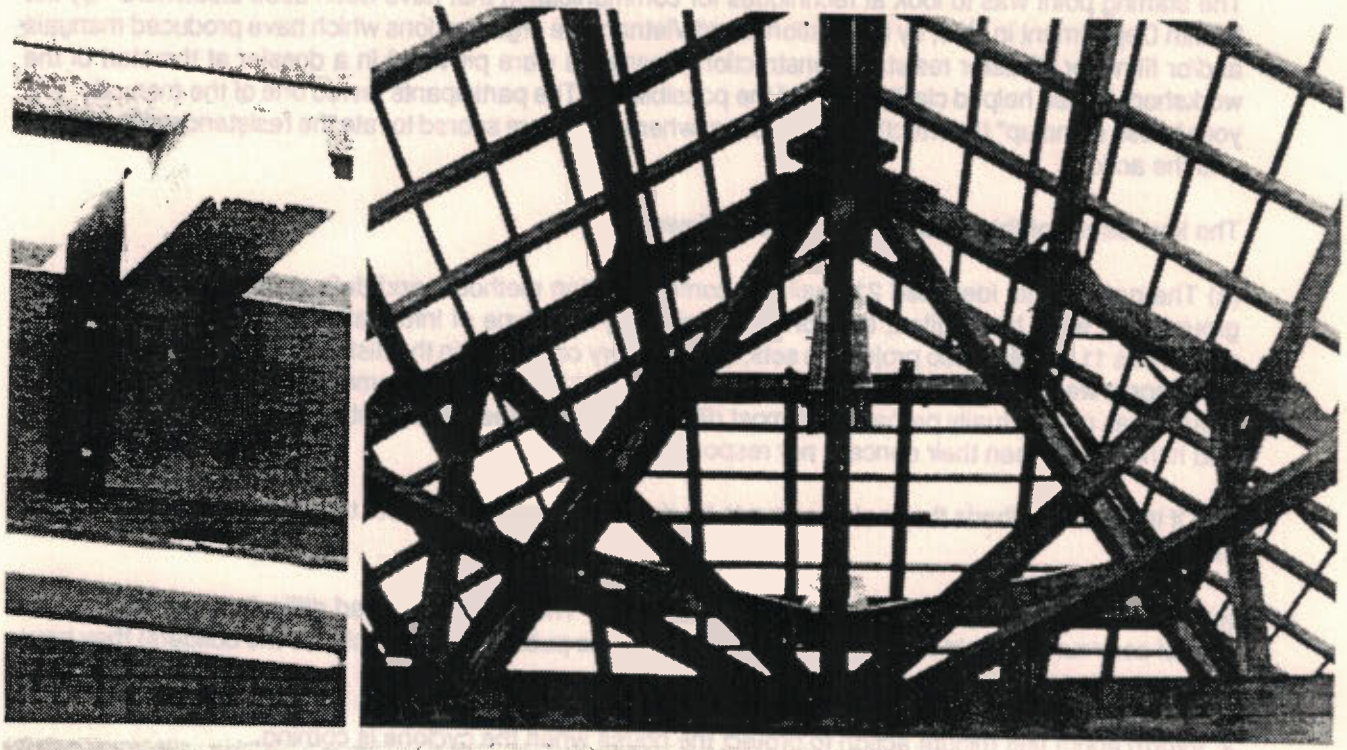
(d) This last point only emerged as the idea of the Action Plan (see below) which includes the role of the Building Adviser, emerged as a clear concept.

(e) The participants rejected the idea of a technical building manual, largely on the grounds that it would need to be very varied and complex unless it related to the specifics of a particular district or sub-region, and thus difficult to use. They saw the leaflet and the product of group 1 as largely replacing a 'manual'.

(f) They proceeded to produce a number of draft versions of the communication material. These were presented at the end of the workshop, and include:
* A poster, to be used by the Building Adviser, showing the ten key principles and shown in reduced form in Annexe 5.
* The leaflet for distribution, also attached in reduced form in Annexe 5.
* The text of the radio announcement.
* A poem about cyclone resistant construction (key principles; action to take) for radio.
* A pack of cards with illustrations of the 10 key points of Cyclone Resistant Construction.
* A dice game with horses, also illustrating cyclone resistant building principles.
* A video film : "My husband builds our house".

(g) The video film, lasting 17 minutes, was produced with the assistance of Hué Television. Destined primarily for projection before the showing of films with the mobile video units in the district, its purpose is to inform the general public of the availability of District Advisers for Cyclone Resistant Construction to whom the public may go, and to promote the use of builders and carpenters trained in Cyclone Resistant Construction, whose names can be provided by the Adviser.

*Reinforcement of the structure*



*Loc Dien primary school*

## 4.9 Working method and results of Group 4

Group 4, with 20 participants, included the majority of the builders participating in the project. Their task was to supervise and construct the demonstration school building at Loc Dien village, and through this provide the opportunity to evaluate or provide experience on a number of points:

* test the degree to which technical solutions are adapted to local conditions - skills, materials and environment;
* provide technicians with experience in designing and constructing and supervising a Cyclone Resistant Building;
* monitor the costs and building quality, and particularly those aspects related to increasing cyclone resistance;
* evaluate the efficiency of "demonstration buildings" as a means of communicating techniques and ideas.

The school was designed in February 1989 by DW/GRET with some of the staff of the IBID and IHPBD during the Preliminary mission, and the material quantities then worked out in France. The construction details were analyzed and finalized by the Group 4 participants during the workshop sessions, once the building work was already underway.

Conclusions to emerge following the completion of the building are as follows :

(a) Designing the building prior to the workshop was necessary to allow the materials to be bought before the workshop started, but it cut the participants off from the basic design process, thus lowering the potential educational impact of the process. Furthermore, delays in communication meant that hardly any materials were in fact bought in advance. The programming for the future activities in the project including the construction of more demonstration buildings, takes these points into account to avoid a repetition.

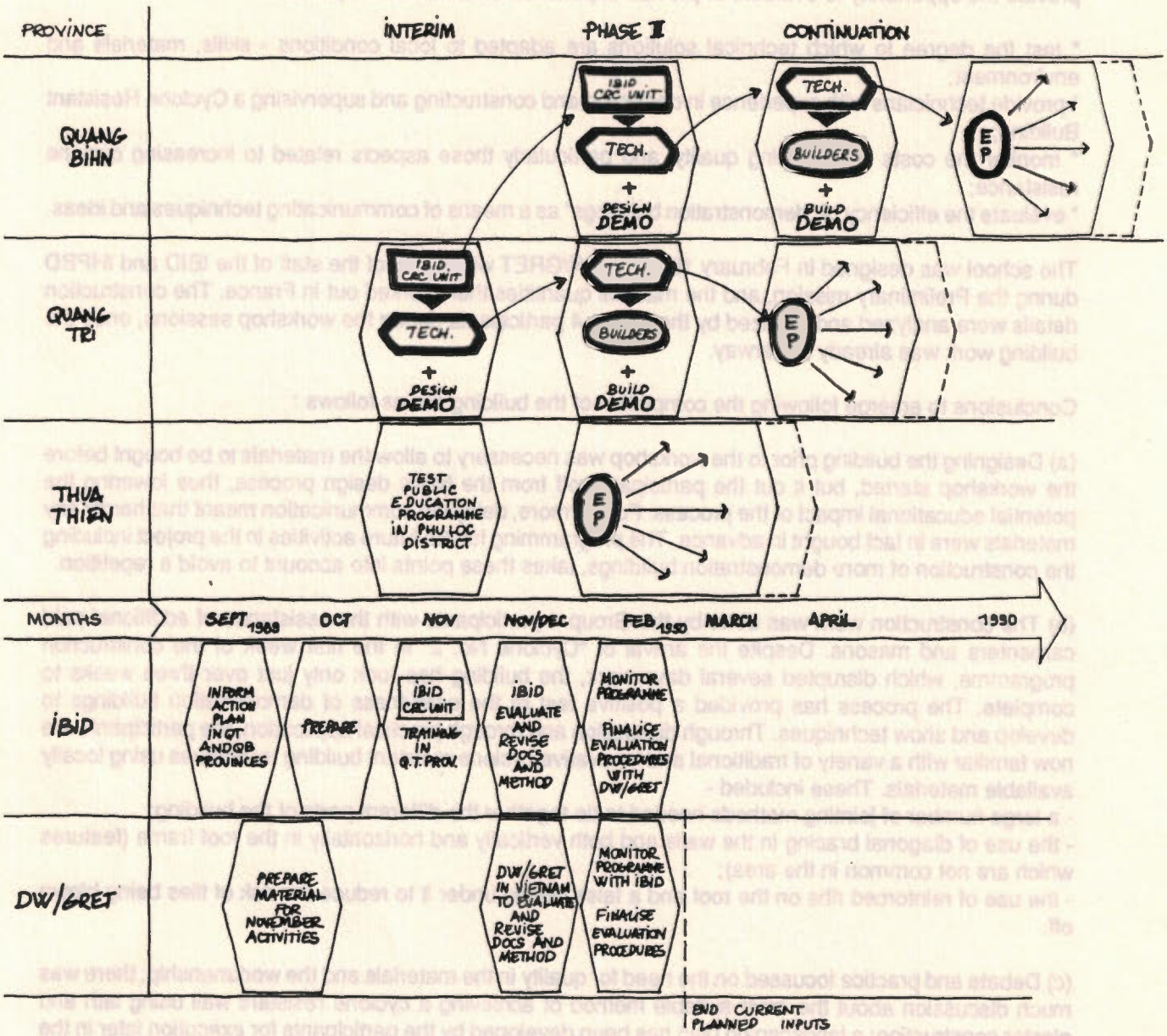
(b) The construction work was done by the Group 4 participants with the assistance of additional paid carpenters and masons. Despite the arrival of "Cyclone No. 2" in the first week of the construction programme, which disrupted several days work, the building has took only just over three weeks to complete. The process has provided a positive test of the usefulness of demonstration buildings to develop and show techniques. Through discussion and through practical application, the participants are now familiar with a variety of traditional and innovative cyclone resistant building techniques using locally available materials. These included -
- a large number of jointing methods needed to tie together the different parts of the building;
- the use of diagonal bracing in the walls and both vertically and horizontally in the roof frame (features which are not common in the area);
- the use of reinforced ribs on the roof and a false ceiling under it to reduce the risk of tiles being blown off.

(c) Debate and practice focussed on the need for quality in the materials and the workmanship; there was much discussion about the most suitable method of achieving a cyclone resistant wall using lath and plaster construction; a landscaping plan has been developed by the participants for execution later in the year.

(d) The school building also provided the opportunity to closely monitor the costs of materials and labour, and, similarly to the work of Group 2, identify the "extra cost" involved in making the building cyclone resistant. The school cost 196 000 Dong/m2 (43.5 $/m2), of which 14 % was incurred for improving cyclone resistance. A more detailed analysis of costs is included in the Brochure produced for the inauguration of the school on the 17th June (See Volume 3).

(e) Amongst the most significant of results, too easily forgotten, is that Loc Dien village children now have a new two classroom school with office and storeroom, and in addition, the building can be used as a place of refuge during cyclones.

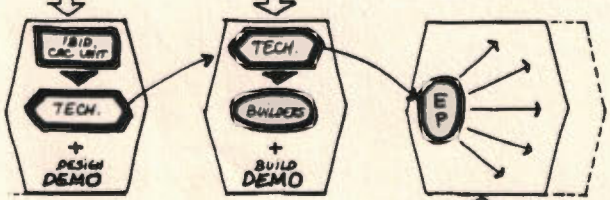
## Table 4 : Programme of activities launching the Action Plan




KEY :

FIRST WORKSHOP :
THE IBID CRC UNIT (CYCLONE RESISTANT CONSTRUCTION) TRAIN THE GROUP OF TECHNICIANS OF THE PROVINCE. TOGETHER, THEY DESIGN THE DEMONSTRATION BUILDING.

SECOND WORKSHOP :
THE FORMER TECHNICIANS TRAIN DISTRICT BUILDERS AND TOGETHER THEY BUILD THE DEMONSTRATION BUILDING.




LAUNCH PROVINCIAL PUBLIC EDUCATION PROGRAMME. TECHNICAL ADVISERS IN ALL DISTRICTS ADVISE PUBLIC AND TRAIN BUILDERS

# 5. THE ACTION PLAN

## 5.1 Background

Developing out of the work of the decision makers seminar and the technicians/builders workshop, an Action Plan has been defined to create the structure, expertise and supporting material necessary for providing practical assistance in cyclone resistant construction to the people of the region. In addition to the contribution from the workshops, the formulation of the Action Plan has been influenced by the current sub-division of Binh Tri Thien province into three new smaller provinces, representing the north, centre and south of the old province. The new provinces are Quang Binh (north), Quang Tri (centre) and Thua Thien (south). The strategy of the Action Plan received the approval, at the end of June, of Mr Dien, the then Vice President of Binh Tri Thien Province, and the overall Project Director.

## 5.2 Objective

The central objective of the Action Plan is to provide advice and technical assistance to the people of each province through the services in each District of at least one Adviser for Cyclone Resistant Construction (ACRC), and through the private sector employment of masons and carpenters who are qualified in Cyclone Resistant Construction techniques after completing a training workshop on the subject.

Parallel to putting in place this capacity, coordinated by the Provincial Building Institute, there will be a Public Education programme to inform the population about the new services and to raise public awareness about cyclone-caused damage to buildings and what can be done.

The training of local masons and carpenters will also contribute directly to improving the quality of public building work on which they are engaged.

## 5.3 Execution and parties involved

The execution of the Action Plan brings together activities at three levels in each province, all aimed at the service of the public.

**PROVINCE**: Building Institutes:
Cyclone Resistant Construction Unit:
* Provincial programme coordination & organization
GENERAL PRESENTATION
* document production
* training District CRCs & support
* evaluation and improvement

**DISTRICT**: District Advisers for Cyclone Resistant Construction (ACRC):
* training commune level builders
* advice to public in the district
* feed-back to the Building Institutes

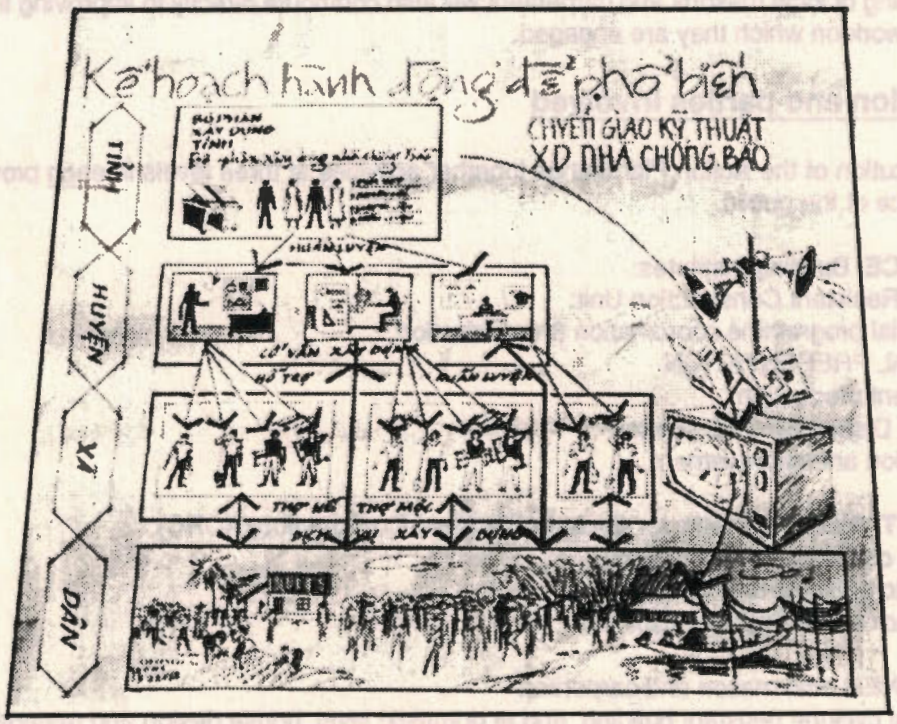
**COMMUNE**: Local mason and carpenter:
* practical cyclone resistant building, and at domestic level, house design and material choice advice.

The programme is based on making use, at least in the near future, of people who are already available at each level - the architects and engineers within the institutes in each Province, the technicians already working in the District, in the Office of Construction and Industry, the District Building Company or the Construction Cooperative, the builders who already exist in the districts and communes. In each case training is needed to give them the right skills and knowledge.

The Public Education programme will involve additional partners (local TV, the Department of Information and Culture, etc.) better placed to organize a wide-scale communication programme, and with whom contact has already been made by the Group 3 participants of the first workshop.

The execution of the Action Plan requires a cycle of training activities in each of the three new provinces, so that by mid 1990 the complete structure is in place, including the launch of the provincial public education programme. Table 4 shows the sequence of events. It is then hoped that the same structure and cycle of training can be developed in other provinces faced with cyclones.

More detail of the responsibilities and roles of the people involved is provided in English and Vietnamese in the Action Plan document handed out at the end of the Phase 1 seminar/workshops, a copy of which is in Annexe 6.



# 6. PROGRAMMING AND FUTURE ACTIVITIES

## 6.1 Action plan implementation

### Actions already undertaken

Already during the first workshop, the first elements of the Action Plan application have been accomplished in Thua Thien province. Thus:

(a) Staff from the Hué IBID have been trained during the workshop, and from amongst the IBID participants two members of the core team, constituting the Unit for CRC, have been selected:
* Mr Dang Mon: Unit leader.
* Mr Nguyen Nguyen

Two more people need to be selected by IBID to be permanent members. Bo Vinh's name was put forward but he participated only marginally in the central activities of the workshop.

(b) In Phu Loc, Mr Dang, having participated in the May/June workshop, will become the first District Adviser for CRC, and will be based in Phu Loc.

(c) Sixteen builders from Phu Loc district have participated in the First technicians/builders workshop.

(d) The video "My husband builds our home", and the draft version of the poster and handout leaflet have been prepared, so that the public education campaign can be tried out.

### Future actions

This start now needs to be followed up by a sequence of actions:

(a) Presentation of Action Plan to other two provinces.

(b) Testing of the Public Education communication material of Phu Loc District and the role of the District Adviser for CRC .

(c) An "interim" programme for technicians in the Quang Tri province.

(d) A preliminary evaluation of the Public Education Programme in Phu Loc, and an evaluation of the training materials and the interim training programme.

(e) Training workshops for technicians (Quang Binh Province) and builders in Quang Tri province and the launch of the provincial level public education programme in Thua Thien Province following (b).

Details of how these are to be achieved are given below.

## 6.2 Presentation of Action Plan

IBID will organize an explanation and discussion of the Action Plan with the People's Committee of Quang Binh and Quang Tri provinces during September/October 1989.

## 6.3 Testing of the Public Education communication material of Phu Loc District and the role of the District Adviser for CRC

IBID, in direct liaison with the department of Culture and Information (Provincial and District) will organize the launch of the public education programme in this one district.

This requires specifically the following -

(a) The District Adviser for CRC (Dang) needs to be available each day at Phu Loc for consultation by the public.

(b) The information leaflet (group 3 product) needs to be available for handout. (500 copies)

(c) The poster should be on display in the Adviser's office.

(d) The video "My husband builds our House" needs to be shown before the showing of films on the districts 11 video projectors. Showings should be announced by megaphone car.

(e) The presence and the role of the Building Adviser should be announced though the loudspeaker system.

(f) The builders who have been trained should be reminded of their role, to provide advice to the public through their building work.

(g) For each person who comes for advice, a questionnaire should be completed giving:
* name and address;
* materials for existing house;
* occupation;
* how he/she heard of the new service;
* are they building a new house or improving existing house?
* what materials do they plan to use for the new construction?

This is essential in order later on to assess what cyclone resistant features have been incorporated into new work.

## 6.4 "Interim" training programme

IBID will organize from the 6th to the 18th November 1989 a training programme for technicians in the Quang Tri province. The participants will become -

(a) the future members of the Quang tri Building Institute's Unit for Cyclone Resistant Construction, and

(b) the future District Advisers for CRC in this province.

They will be joined, for this training session held in Quang Tri Province, by technicians from districts in Thua Thien province who have not already been trained and who will become the future District Advisors for CRC in their own districts.

During this training programme, the participating technicians will design the second demonstration building, to be built in Quang tri province, and which is to be a primary school with an overall surface area of approximately 120m2. The building will be constructed later during the builders training workshop to be run in February 1990 in Quang Tri Province.

This training programme will take place without the presence of DW/GRET, and its purpose is also to test the training materials developed beforehand and to see how well the training process operates without assistance. DW/GRET will arrange for training materials and guidelines and the detailed programme to be delivered to IBID before the start of the workshop.

IBID should identify the number and names of the participants for this workshop as quickly as possible, so that DW/GRET can calculate the per-diem budget necessary for running the workshop and request UNCHS for approval.

## 6.5 Preliminary evaluation of Public Education Programme in Phu Loc, and an evaluation of the training materials and the interim training programme

DW/GRET will send one team member at the end of November 1989 for three weeks to participate in this evaluation with the staff of IBID and IHPBD, and to jointly make any necessary modifications to the training materials or the organization of work.

The detailed programme for the February/March 1990 Phase 2 seminar/workshops will be established at this stage, at the same time that materials and programme documents are made ready for reproduction prior to the Phase 2 seminar/workshops.

## 6.6 Training workshops for technicians (Quang Binh province) and builders in Quang Tri province and the launch of the provincial level public education programme in Thua Thien province

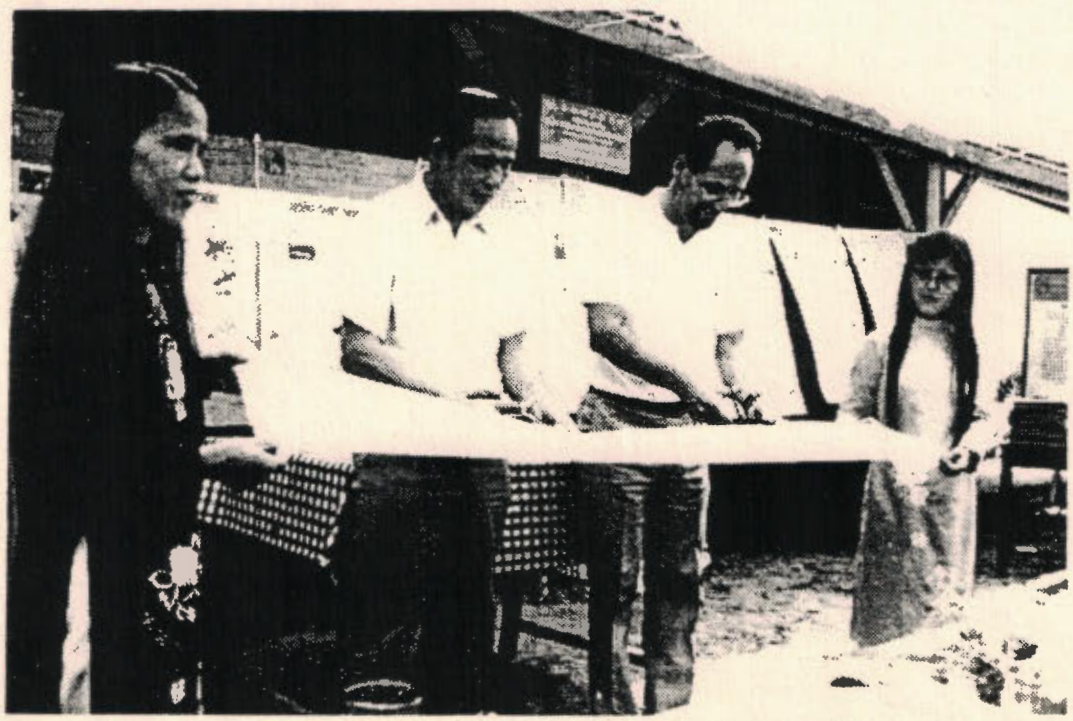
In February/March 1990 training workshops will be organized for technicians (Quang Binh Province) and builders (Quang Tri Province), the latter run by the Quang Tri district technicians in each district. The launch of the provincial level public education programme will take place in Thua Thien Province, having benefitted from the experience of the Phu Loc trial run.

IBID (Hué) and its fellow institutes in Quang Binh and Quang Tri, will organize these workshops. DW/GRET will at the same time work with IBID to develop the local capacity to continue to evaluate the methods and products so that the programme can evolve in response to future needs.

# CONCLUSIONS

The project is now moving to a critical phase, the success of which will largely determine the final outcome of the project. In the First Session workshop, the DW/GRET team, have taken a leading role as animators of the project, in the organization of daily activities, in the presentation of theoretical sessions and in the design of the first demonstration building, the school at Loc Dien. This was a necessary step in developing the programme, in demonstrating a workshop method for training, and in finding out what can realistically be achieved.

Now, with the definition of the Action Plan, our counterparts will play an increasingly important role in the preparation and operation of training work and the testing and subsequent launch of the public education programme. This responsibility for animating training and communication activities will, to start with, rest particularly with the Unit for CRC within the IBID. The Unit staff will organize and carry out the training workshop for technicians to be held in Quang Tri in November.This represents an important opportunity to test the training materials prepared so far, and the capacity of the CRC Unit to organize and run the training session. The Unit will also set up the public education programme with other concerned departments in the Thua Thien province and Phu Loc district, also in November. This work will be evaluated straight after the November workshop, so that any modifications to the programme or the materials that are being used can be made prior to the February 1990 activities, and so that any additional training support for the CRC Unit can be identified and supplied by DW/GRET. The November activities therefore represent the first step in handing over to our Vietnam counterparts the responsibility for operating the various elements of the Action Plan. The role of DW/GRET will be increasingly to evaluate the products and the programme with IBID and IHPBD, and to ensure that similar evaluations can regularly be carried out in the future by the Vietnam organizations concerned with demonstrating Cyclone Resistant Building techniques in the region.



*Inauguration of Loc Dien primary school by Mr.Pham Ba Dien (Director of the project) and Mr.Bob Hardy (UNCHS-Habitat)*

# ANNEXES

# ANNEXE 1 Participants in Phase 1 seminar/workshops

**a) Participants in the Decision Makers Workshop.**

The participants in the Decision makers workshop were to have represented the policy makers in the province, capable of making decisions about the Action Plan and of developing ideas about how to implement it.

In reality, the participants represented more strongly those people responsible for the executive direction of activities, real policy decisions being made in the People's Committee at provincial (and central) level. The Decision Makers Workshop was opened by Pham Ba Dien, Vice President of the Binh Tri Thien province. Twenty seven people participated in the Decision Makers workshop, including architects and engineers, the Manager of Hué Radio, the Director of the Health Department, and the heads of Sub-Projects Nos. 1 and 2. A complete list of participants is included at the end of this Annexe.

Participants were identified and invited by the IBID, Hue. The IHPBD was not represented by anybody during the Decision Makers Workshop.

**b) Technicians participating in the Technicians & Builders Workshop.**

Participants included architects, engineers, technicians and one artist, and came either from the IBID (13 people) or from the Districts (Phu Loc) or the provincial secondary centres, including Quang Trach and Dong Ha, the future provincial capitals of the Provinces of Quang Binh and Quang Tri, which correspond to the centre and the north of the old Binh Tri Thien Province.

The 23 participants presented a slight imbalance between technicians at provincial level (strong) and those working at district level (weak), which will be corrected in future workshops. Participants were selected by IBID.

Two technicians from IHPBD were present for some of the time during the workshop, but regrettably nobody for the first week of the workshop.

A complete list of participants is included at the end of this Annexe.

**c) Builders participating in the Technicians & Builders Workshop.**

Twenty five builders participated in the workshop, 9 of whom are masons, one an "investigator" (Công nhân K. sât), and the rest carpenters.

10 came from Loc Dien commune in Phu Loc District, ten from the Phu Loc Construction Cooperative, and five from amongst IBID's own builders.

Participants were chosen by IBID, with the help of the authorities in Phu Loc district.

DEMONSTRATION OF STORM RESISTANT BUILDING TECHNIQUES

VIE / 85 / 019

SUB-PROJECT No 3

## LIST OF THE PARTICIPANTS
## THE 1st POLICY MARKERS'SERMINAR
## (At the IBID in Hue and Locdien )

| No: | NAME | OCUPATION | PRESENT POSITION |
|---|---|---|---|
| 01: | Phạm Bá Diễn | Engineer | Vice-President of the province |
| | | | General director of project |
| 02: | Nguyễn Hữu Ngô | | Official of the people's comit |
| 03: | Hồ Văn Hùng | | Official |
| 04: | Lê Xuân Tứu | | Vice-director of the Department |
| | | | of construction |
| 05: | Lê Thái Dương | | Vice-director DC |
| 06: | Phan Tứ | Architect | Head of DC technic section |
| 07: | Nguyễn Xuân Bình | | Head of construction section |
| 08: | Trịnh Văn Sủng | | Personnel |
| 09: | Trần Văn Chương | | Head of planification section |
| 10: | Nguyễn Thế Truyền | | Vice-director of IBID |
| 11: | Hoàng Minh Nhuân | | Head of planification section |
| 12: | Võ Hoài Tân | | Director,sub-project No1 |
| 13: | Nguyễn Văn Sắc | | Director,sub-project No2 |
| 14: | Nuyễn Việt | | Sub-project No2 |
| 15: | Nguyễn Văn Tỉnh | | Vice-president of Phu Loc distric |
| 16: | Phan Vui | | Head of construction section of Pl |
| 17: | Hoàng Phước | | Director of the hidraw department |
| 18: | Nguyễn Văn An | | Vice-president of Q.Trach districk |
| 19: | Nguyễn Trí Việt | | Director of IBID |
| 20: | Hà Văn Thuấn | | Director of construction compary |
| 21: | Nguyễn Viết Tiến | | Head of construction section |
| | | | of HUE city |

General Director of project

Director of the sub-proj. No 3

Pham Bá Diễn

Nguyễn Sĩ Viên

## 1/ )A H SACH CAN BO KY THUAT, CONG NHAN THỢ, CAN BO KT BỘ XAY DỰNG VA CAN BO, NHAN VIEN PHUC VU LỚP TAP HUAN CHUYEN GIAO KY THUAT NHA CHONG GIO BAO DOT I TAI PHU LỘC TINH BINH TRI THIEN(

TECHNICIANS

| TT | HO VA TEN | | Nghề nghiệp | Nơi làm việc | Ghi chú |
|---|---|---|---|---|---|
| 1 | Nguyên sỹ Viên | | Ky sư xây dựng | Xi nghiệp KSTK | |
| 2 | Đặng Mọh | x | Ky sư Engineer | - IBID | |
| 3 | Phạm văn Điền | x | Trung cấp K.S | - | Technician |
| 4 | Lê gia Khánh | x | Kỹ sư XD | - | Civil Engineer |
| 5 | Lê hồng Sơn | x | Kỹ sư XD | - | — |
| 6 | Hoàng văn Hiền | x | Ky sư KTXD | - | — |
| 7 | Nguyễn văn Cảnh | x | Kiến trúc sư | - | Architect |
| 8 | Nguyễn Nguyên | x | Kiến trúc sư | - | — |
| 9 | Phạm văn Tuynh | x | Kỹ sư XD | - | Civil Engineer |
| 10 | Nguyễn quang Bình | x | Kỹ sư xây dựng | - | — |
| 11 | Nguyễn hữu Thăng | x | Kỹ sư XD | Civil Engineer | Tham dự tới 24.5+ 2/6/89 |
| 12 | Võ Đình | x | Trung cấp XD | - | Technician |
| 13 | Trần thi Vân | x | Trung cấp XD | - | — |
| 14 | Nguyễn lương Tùy | x | Kỹ sư XD | Huyện Q.trạch | Civil Engineer |
| 15 | Phạm văn Duốc | x | Ky sư XD | Huyện Bố trạch | — |
| 16 | Nguyễn xuân Định | x | Kiến trúc sư | Thị xã Đồng Hới | Architect |
| 17 | Lê thanh Hùng | x | Kỹ sư XD | Huyện Triệu Hải | Civil Engineer |
| 18 | Trần đức Cảnh | x | Trung cấp XD | Huyện Triệu Hai | Technician |
| 19 | Nguyễn gia Đàng | x | Kiến trúc sư | Thị xa Đồng Hà | Architect |
| 20 | Nguyễn quang Thắng | x | Ky sư xây dựng | Thi xa Đông Hà | Civil Engineer |
| 21 | Mai xuân Giảng | x | Kỹ sư XD | Huyện Phú Lộc | — |
| 22 | Nguyễn ngọc Lợi | x | Trung cấp XD | Huyện Phú Lộc | Technician |
| 23 | Lê thừa Tiến | x | Họa Sỹ | Xi nghiệp KSTK | Artist (IBID |

2) CONG NHAN THỢ MOC NE LỚP TAP HUAN BUILDERS

| TT | HO VA TEN | | Nghề nghiệp | Nơi làm việc | Ghi chú |
|---|---|---|---|---|---|
| 1 | Lê Trừu | x | Công nhân nề 4 | Vinh mỹ Phú Lộc | |
| 2 | Mai Chiến | x | Mason 4 | - | |
| 3 | Lê văn Sơn | x | - 4 | - | |
| 4 | Lê Hoàng | x | - 4 | - | |
| 5 | Mai Cường | x | - 4 | - | |
| 6 | Nguyễn văn Tường | x | Cn mộc 4 | - | |
| 7 | Nguyễn văn Linh | x | Carpenter | | |
| 8 | Nguyễn Pháp | x | - 4 | - | |

| TT | HỌ VÀ TÊN | | Nghề nghiệp | | Đơn vị công việc | GHI CHÚ |
|---|---|---|---|---|---|---|
| 9 | Cái Ẩn | x | C.nhân mộc | 4 | Vinh mỹ Phú Lộc | |
| 10 | Đặng văn Thọ | x | Carpenter | 4 | - | |
| 11 | Lê Dương | x | - | 4 | Lộc điền Phú Lộc | |
| 12 | Lê Thành | x | - | 4 | - | |
| 13 | Ngô Chiến | x | - | 4 | - | |
| 14 | Lê Lộc | x | - | 4 | - | |
| 15 | Lê văn Cần | x | - | 4 | - | |
| 16 | Nguyễn Thành | x | - | 4 | - | |
| 17 | Đặng Tắc | x | - | 3 | - | |
| 18 | Trần Tuấn | x | Nề | 4 | - | |
| 19 | Nguyễn Minh | x | - Mộc | 3 | - | |
| 20 | Phạm Hương | x | Mộc | 3 | | |
| 21 | Hằng văn Năng | x | Công nhân nề | 5 | Xí nghiệp KSTK | CIDED |
| 22 | Hoàng văn Dương | x | Mason | 2 | - | |
| 23 | Phạm quang Đạo | x | - | 2 | - | |
| 24 | Trần đức Thắng | x | - | 2 | - | |
| 25 | Lê văn Thứ | x | Công nhân K.sát | | Investigator | |

3) CÁN BỘ PHỤC VỤ - SUPPORT PERSONNEL

| | | | | | |
|---|---|---|---|---|---|
| 1 | Hoàng vĩnh Thắng | x | Thạc sỹ KHXD | Viện T/kê Bộ XD | Engineer |
| 2 | Nguyễn tấn Vạn | x | KT sư Xây dựng | Viện T/kê Bộ XD | Architect |
| 3 | Phan hữu Hạnh | x | Phiên dịch Anh | Uỷ Ban KH Tỉnh BTT | Translator |
| 4 | Hồ Vĩnh | x | Phiên dịch anh | Trường TH gia hội Huế | — |
| 5 | Đoàn Phúc | | Lái xe | Xí nghiệp KSTK | |
| 6 | Trần hữu Chút | | Lái xe | - | Phục vụ từ 5/6 - 17/6 |
| 7 | Nguyễn văn Chỉnh | | Giữ kho | - | |
| 8 | Nguyễn đức Thắng | | K.trúc sư | Phục vụ XNKS T/kê | |

GIÁM ĐỐC TIỂU DỰ ÁN
VIE/85/019C

Nguyễn sỹ Viên

Phú lộc ngày 16/6/1989
Cán bộ tổng hợp

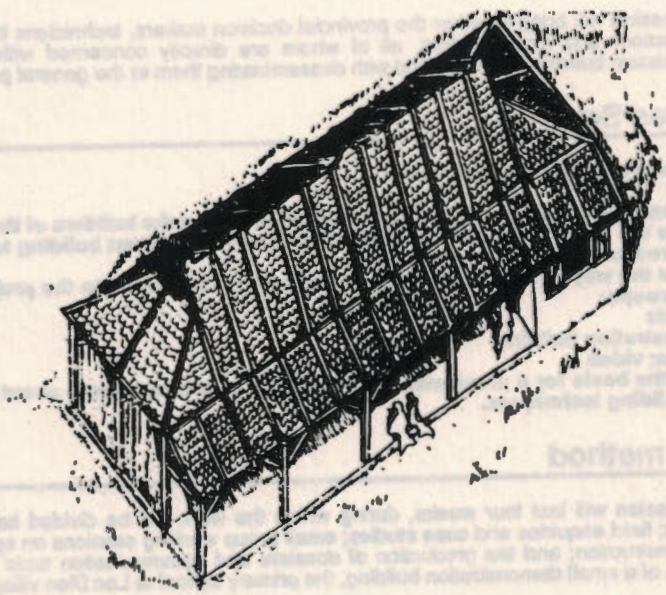
Phạm văn Điền

# ANNEXE 2 Detailed programme for Phase 1

Disaster preparedness and rehabilitation in Binh Tri Thien Province, Vietnam
Sử bảo vệ chống thảm-hoa thiên-nhiên ở tỉnh Bình Trị Thiên, Việt Nam

VIET/85/019

CHUYỂN GIAO KỸ THUẬT XÂY DỰNG NHÀ CHỐNG GIÓ BÃO
DEMONSTRATION OF STORM RESISTANT BUILDING TECHNIQUES



# Session I

**22 may - 17 june 1989**

**Hué**

Development Workshop

Viện Thiết Kế Nhà Ở - Công Trình Công Cộng, Hànội
Institute For Housing and Public Building Design

Xí Nghiệp Thiết Kế Khảo Sát Xây Dựng, Huế
Institute For Building Investigation and Design

GRET

## Presentation of the programme - General objectives

The VIE/85/019 sub project has been developed as a response to the damage caused by cyclones in the Binh Tri Thien province. The project's objectives are to define a provincial and national action plan which will raise public awareness of the need to minimise the effect of a cyclone on building and the steps that can be taken for doing so. It aims to disseminate as widely as possible to builders and the general public alike cyclone resistant building methods which are within the reach of the population and adapted to local conditions.

To carry out this project, two sessions of workshops are being organised, the first in May-June 1989, and the second in February 1990. The preparation of communication media - video, manuals, etc.. - in each case specifically designed to suit the target groups of the project, will be an important part of the programme.

The first session will bring together the provincial decision makers, technicians from the Ministry of Construction, and local builders, all of whom are directly concerned with understanding cyclone resistant building methods, and with desseminating them to the general public.

## Objectives Session I

The objectives of Session I are as follow:

- **define training methods adapted to the technicians and the builders of the region;**
- **examine the value of traditional and current cyclone resistant building techniques and the degree to which they are in use;**
- **evaluate the ways in which techniques can be communicated to the project's different target groups:**
  - **manuals**
  - **demonstration building**
  - **posters; video**
- **set out the basis for a provincial action plan for informing people about cyclonic resistant building techniques.**

## Working method

The first session will last four weeks, during which the work will be divided between general course work; field enquiries and case studies; small group working sessions on specific aspects; practical construction; and the production of dossiers and communication tools as well as the construction of a small demonstration building, the primary school at Loc Dien village.

## Working groups

The participants of the session will be divided into four groups:

**Group 1:** *analysis of the effects of cyclones on buildings in the province - examination of key points of weakness;*
**Group 2:** *study of the economic impact of technical innovations which can improve the cyclone resistance of buildings;*
**Group 3:** *evaluation of the ways in which ideas and information can be communicated to builders and the population in general;*
**Group 4:** *supervision of the primary school building .*

## Expected results

- ***Training of technicians and builders;***
- ***Selection of techniques adapted to the local context - materials, economics, skills and the climate;***
- ***Construction of a demonstration building and its evaluation;***
- ***Preliminary development of communication media.***

# Programme

| DATES | POLICY MAKERS | TECHNICIANS | BUILDERS | TECHNICIANS / BUILDERS |
|---|---|---|---|---|
| *Monday 22 may*<br>*Tuesday 23* | Discuss programme objectives | | | Foundations |
| *Wednesday 24* | | Start workshops → Presentation of programme : objectives, working methods, expected results / Presentation of participants | | |
| *Thursday 25* | | Principles of cyclone resistant construction / Establishing working groups | | |
| *Friday 26*<br>*Saturday 27 may* | | Field studies :<br>methodology, preparation | | |
| *Monday 29 may* | | Building of school | | Structures |
| *Tuesday 30*<br>*Wednesday 31*<br>*Thursday 1 june*<br>*Friday 2* | | *8h-10h* General session<br>*10h-12h* Case studies<br>Results of investigations<br>*14h-17h* Field studies<br>Practical work | *8h-10h* General session<br>*10h-12h* Case studies<br>Results of investigations<br>*14h-17h* Building school | |
| *Saturday 3 june* | Site visit | | | |
| *Monday 5 june*<br>*Tuesday 6* | | Building school | | Walls and roof |
| *Wednesday 7*<br>*Thursday 8*<br>*Friday 9* | | *8h-10h* General session<br>*10h - 17h* Groups work :<br>- surveys<br>- preparation of dossiers | *8h-10h* General session<br>*10h - 17h* Building of school | |
| *Saturday 10 june* | Site visit | | | |
| *Monday 12 june* | | Building of school | | Roof covering and finishes |
| *Tuesday 13*<br>*Wednesday 14*<br>*Thursday 15* | | *8h-10h* General session<br>*10h - 17h* Production :- dossiers, documents<br>- communication tools | *8h-10h* General session<br>*10h - 17h* Building of school | |
| *Friday 16* | | Presentation of results of working groups / Assessment / Exhibition | | |
| *Saturday 17 june* | Inauguration of Loc Dien school / Formal closing of Session I | | | |

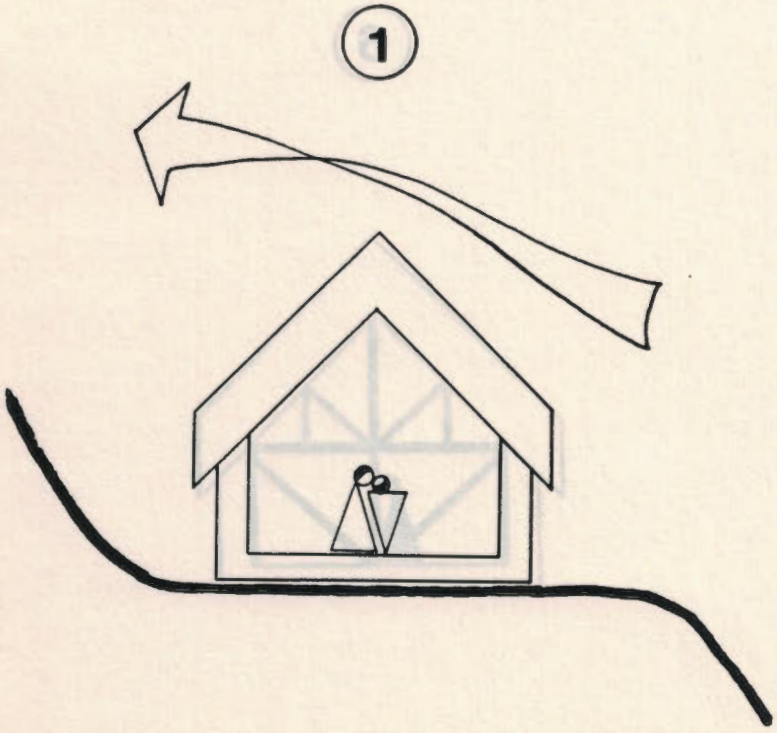
SCHOOL CONSTRUCTION

**Participants** : *Local officials ; technicians (Ministry of Construction) ; local builders*
**Place** : *Hué, Phu Loc district - Loc Dien/ Binh Tri Thien province*

| DATES | PILOT BAKERS | TECHNICIANS | SUBJECTS | TECHNICIANS / BAC DOMS |
|---|---|---|---|---|
| Monday 22 may<br>Tuesday 23 | Discuss programme objectives | | | Foundations |
| Wednesday 24 | | Start workshops → Presentation of programme : objectives, working methods, expected results / Presentation of participants | | |
| Thursday 25 | | Principles of cyclone resistant construction / Establishing working groups | | |
| Friday 26<br>Saturday 27 may | | | Field studies :<br>methodology, preparation | |
| Monday 29 may | | | Building of school | |
| Tuesday 30<br>Wednesday 31<br>Thursday 1 June<br>Friday 2 | | Case studies<br>Results of<br>investigations | Practical work | General session<br>Case studies<br>Results of investigations<br>Building school | Structures |
| Saturday 3 June | Site visit | | | |
| Monday 5 June<br>Tuesday 6 | | | Building<br>school | | Walls and roof |
| Wednesday 7<br>Thursday 8<br>Friday 9 | | Groups work :<br>- surveys<br>- preparation of dossiers | | General session<br>Building of school | |
| Saturday 10 June | Site visit | | | |
| Monday 12 June<br>Tuesday 13<br>Wednesday 14<br>Thursday 15 | | Production : - drawings, documents<br>- communications tools | | Building of school<br>General session<br>Building of school | Roof covering and finishes |
| Friday 16 | | | Presentation of results of working groups / Assessment / Exhibition | | |
| Saturday 17 June | Inauguration of Loc Dien school / Forms closing of Session : | | | | |

| | |
|---|---|
| Participants<br>Place | : Local officials , committee (Mayor of Commune), local builders<br>: Loc Dien Lao district - Loc Dien school for Thien province |

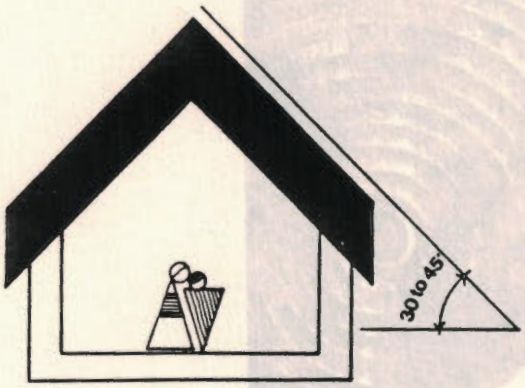
# ANNEXE 3 10 key cyclone resistant building principles


use landscape and topography
to minimise flood risk
and modify wind speed and direction

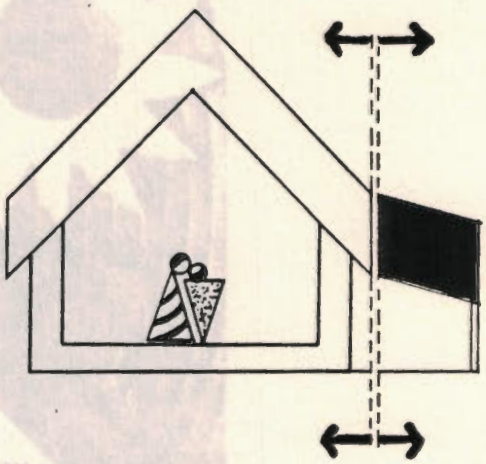

give the building an uniform shape
presenting minimum obstruction to the wind

3



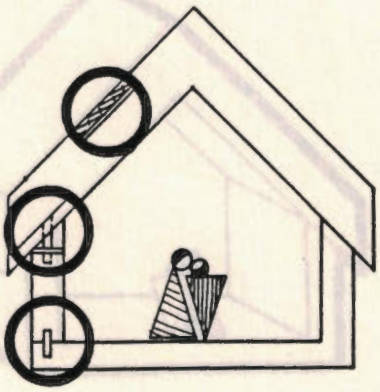

keep the roof pitch between 30° and 45°
to minimise suction
caused by negative pressure

4



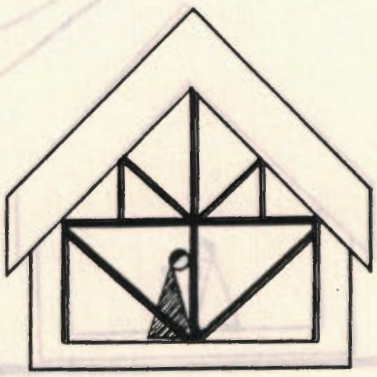
avoid large roof overhangs
separate verandah covering and frame
from main roof

5



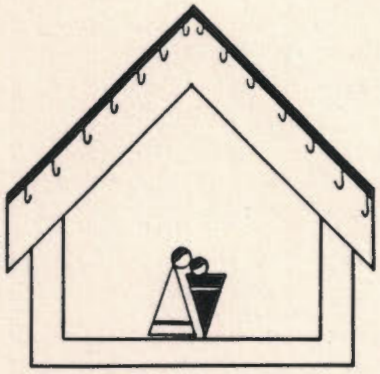
make sure of strong fixings and joints
between all elements :
foundations - walls - cladding
walls - roof frame
roof frame - covering

6



reinforce vertical and horizontal triangulation
(diagonal bracing)

7

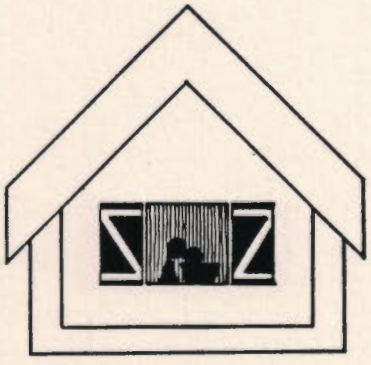


make sure roof covering elements
cannot be lifted off by wind

8

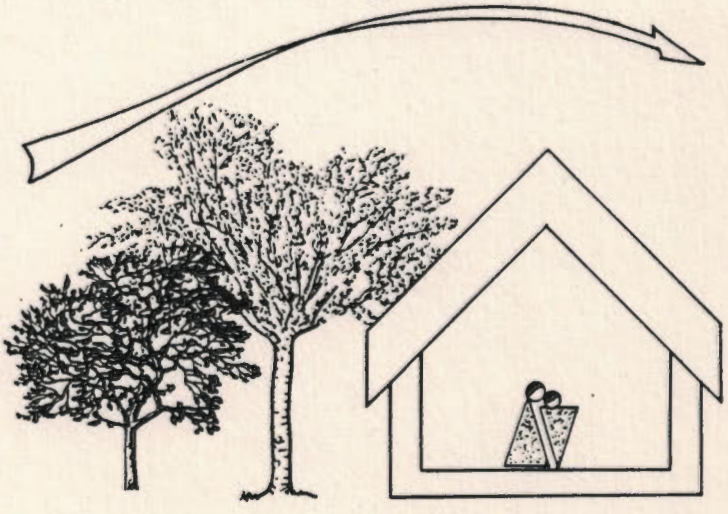
balance the size of openings
in opposing walls

9



make sure all openings can be closed

10



use planting of trees and bushes
to reduce wind speed

7



make sure roof covering elements
cannot be lifted off by wind

8



balance the size of openings
in opposing walls

9



make sure all openings can be closed

10



use planting of trees and bushes
to reduce wind speed

# ANNEXE 4 Material prices in June 1989.

| MATERIALS | TYPE | UNIT | ORIG. | | COSTS IN HUE | | COSTS IN PHU LOC | |
|---|---|---|---|---|---|---|---|---|
| | | | | | State | Private | State | Private |
| Cement | P 300 | kg | N | | 260 | 260 | 280 | 280 |
| Cement | P 200 | kg | L | | 145 | 150 | 165 | 165 |
| Lime | | kg | L | | 85 | 90 | 100 | |
| Lime wash | | kg | L | | | 300 | | 310 |
| Sand | 1 mm | m3 | L | | | 12 800 | | 12 500 |
| Gravel | 1-2 | m3 | L | | | 28 000 | | 27 500 |
| Gravel | 4-6 | m3 | L | | | 19 500 | | 18 000 |
| Steel | 0 6-24 | kg | I | | 1 250 | 1 300 | 1 300 | 1 350 |
| Steel string | 0 1-2 | kg | I | | | 2 000 | | 2 500 |
| Wood coffr. | Grade 6-7 | m3 | L | | 30 000 | | 30 000 | 30 000 |
| Bamboo | 0 60-100 | tree | L | | | 2 800 | | |
| Wood | 2 qual. | m3 | L | | 530 000 | 550 000 | 585 000 | |
| Wood | 3 qual. | m3 | L | | 430 000 | 435 000 | 455 000 | |
| Wood | 4 qual. | m3 | L | | 360 000 | 360 000 | 405 000 | |
| Glass | 3 mm | m2 | N | | 30 000 | | | |
| Brick | 60x110x220 | u | L | | 85 | 85 | 95 | |
| Brick 4 holes | 110x110x220 | u | L | | 105 | 105 | 110 | |
| Cement block | 120x200x300 | u | L | | | 630 | | |
| Stone | | m3 | L | | 18 000 | | | |
| Cut stone | 300x300x300 | u | L | | | | | 4 000 |
| Tile | 22/m2 | u | L | | 190 | 200 | 210 | |
| Bamboo wattle | | m2 | L | | | | | 2 000 |
| Thatch | 800x1200 | u | L | | | 600 | | 500 |
| Fibrocement | 800x1400 | u | N | | 14 000 | 14 000 | 14 000 | 15 000 |
| Iron sheet | 800x2000 | u | I | | 30 000 | 30 000 | 30 000 | 30 000 |
| Colour powder | | kg | I | | 6 500 | 6 700 | | 6 800 |
| Nails | 2-10 cm | kg | N | | | 1 700 | | 1 800 |
| Paint | | kg | N | | 3 500 | 3 600 | 3 500 | 3 700 |

Price in Dongs (June 1989)

L = Local
N = National
F = Imported

Source : IBID/DW/GRET June 1989

# ANNEXE 4 Material prices in June 1989.

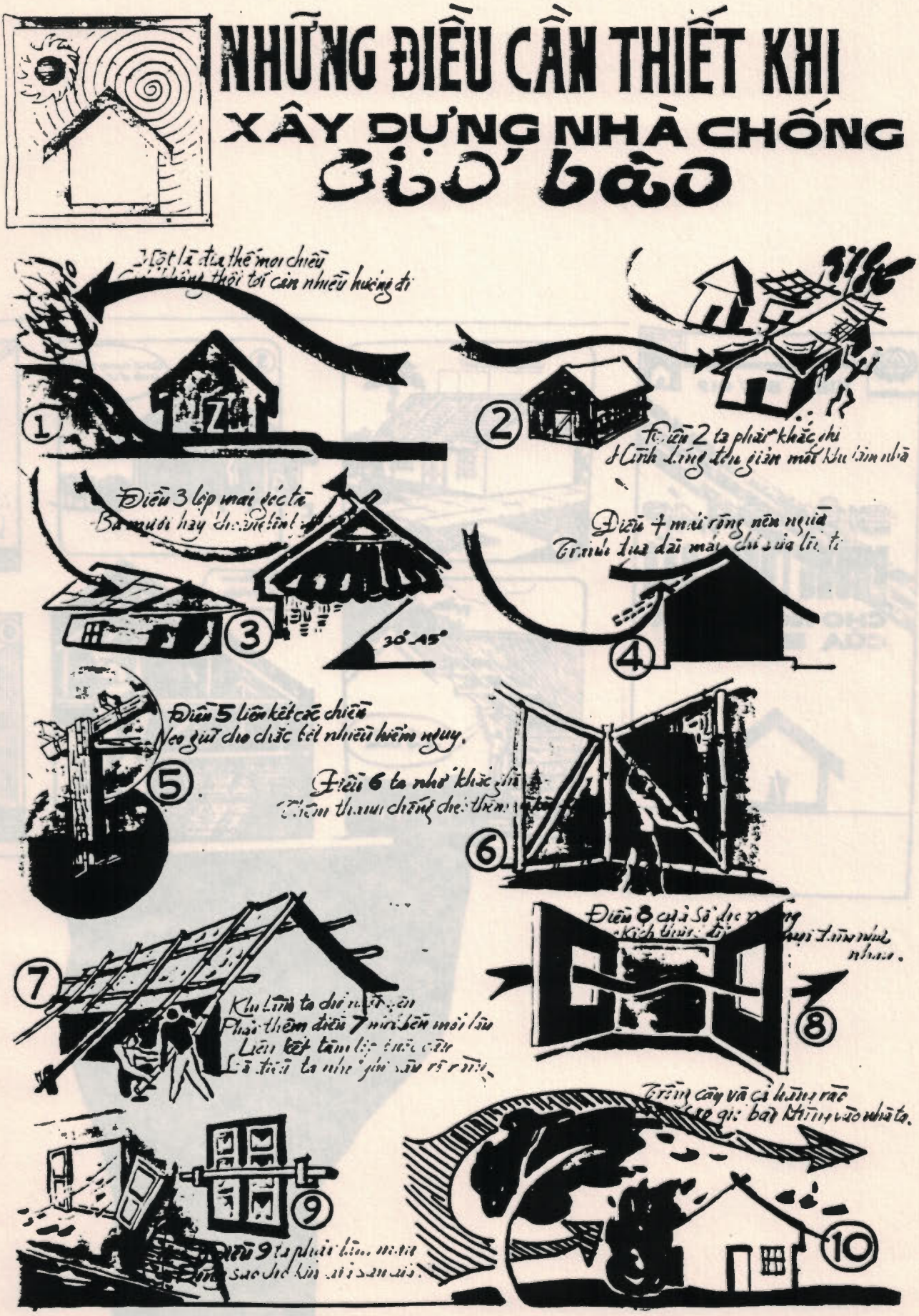
| MATERIAL | UNIT | COSTS IN BOB | | | COSTS IN ZAM | | |
|---|---|---|---|---|---|---|---|
| | | STATE | PRIVATE | | STATE | PRIVATE | |
| Cement | kg | 360 | 126 | | 360 | 210 | 280 |
| Cement | kg | 145 | 120 | | 115 | | 145 |
| Lime | kg | 45 | 40 | | 100 | | |
| Lime wood | kg | | 300 | | | | 320 |
| Sand | m3 | | 12 000 | | | | 17 500 |
| Gravel | m3 | | 24 000 | | | | 17 500 |
| Gravel | m3 | | 14 500 | | | | 16 000 |
| Steel | kg | 320 | 280 | | 300 | | 1 200 |
| Steel netting | kg | | 3 000 | | | | 3 500 |
| Wood cutt. | m3 | 10 000 | | | 30 000 | | 32 000 |
| Bamboo | m | | 2 000 | | | | |
| Wood | m3 | 530 000 | 520 000 | | 320 000 | | 350 000 |
| Wood | m3 | 420 000 | 415 000 | | 400 000 | | 405 000 |
| Wood | m3 | 320 000 | 320 000 | | 300 000 | | 400 000 |
| Glass | m2 | 20 000 | | | | | |
| Brick | 1000x120x120 | 45 | 85 | | 95 | | |
| Brick & tiles | 1100x1100x220 | 165 | 140 | | 220 | | |
| Cement block | 1200x200x200 | | 250 | | | | |
| Screw | m2 | 10 000 | | | | | 4 000 |
| Cut stone | 300x300x200 | | | | | | |
| Tile | 22/m2 | 120 | 200 | | 320 | | |
| Bamboo matte | m2 | | | | | | 1 000 |
| Plastic | 800x1200 | | 600 | | | | 500 |
| Fibrocement | 800x1600 | 14 000 | 14 000 | | 16 000 | | 15 000 |
| Iron sheet | 800x2000 | 20 000 | 20 000 | | 30 000 | | 30 000 |
| Colour powder | kg | 6 500 | 6 700 | | | | 5 000 |
| Nails | 3-10 cm | | 1 700 | | | | 1 500 |
| Paint | kg | 3 500 | 3 000 | | 3 500 | | 3 700 |

Price in Bongo (June 1989)

L = Local
N = National
I = Imported

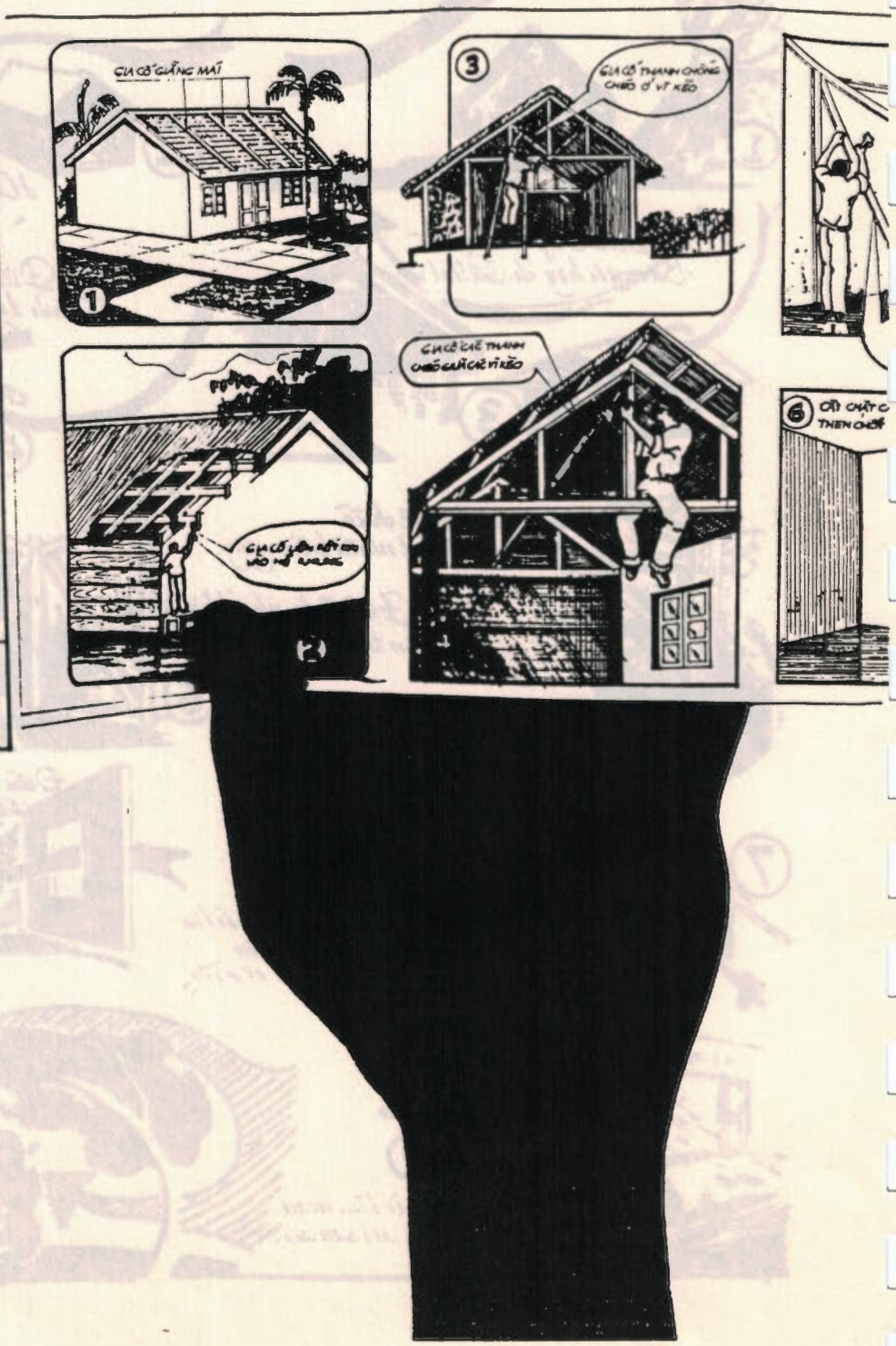
Source : INSTITUT/CENT (June 1989)

## ANNEXE 5 Draft versions of communication materials produced by Group 3 of the technicians/builders workshop



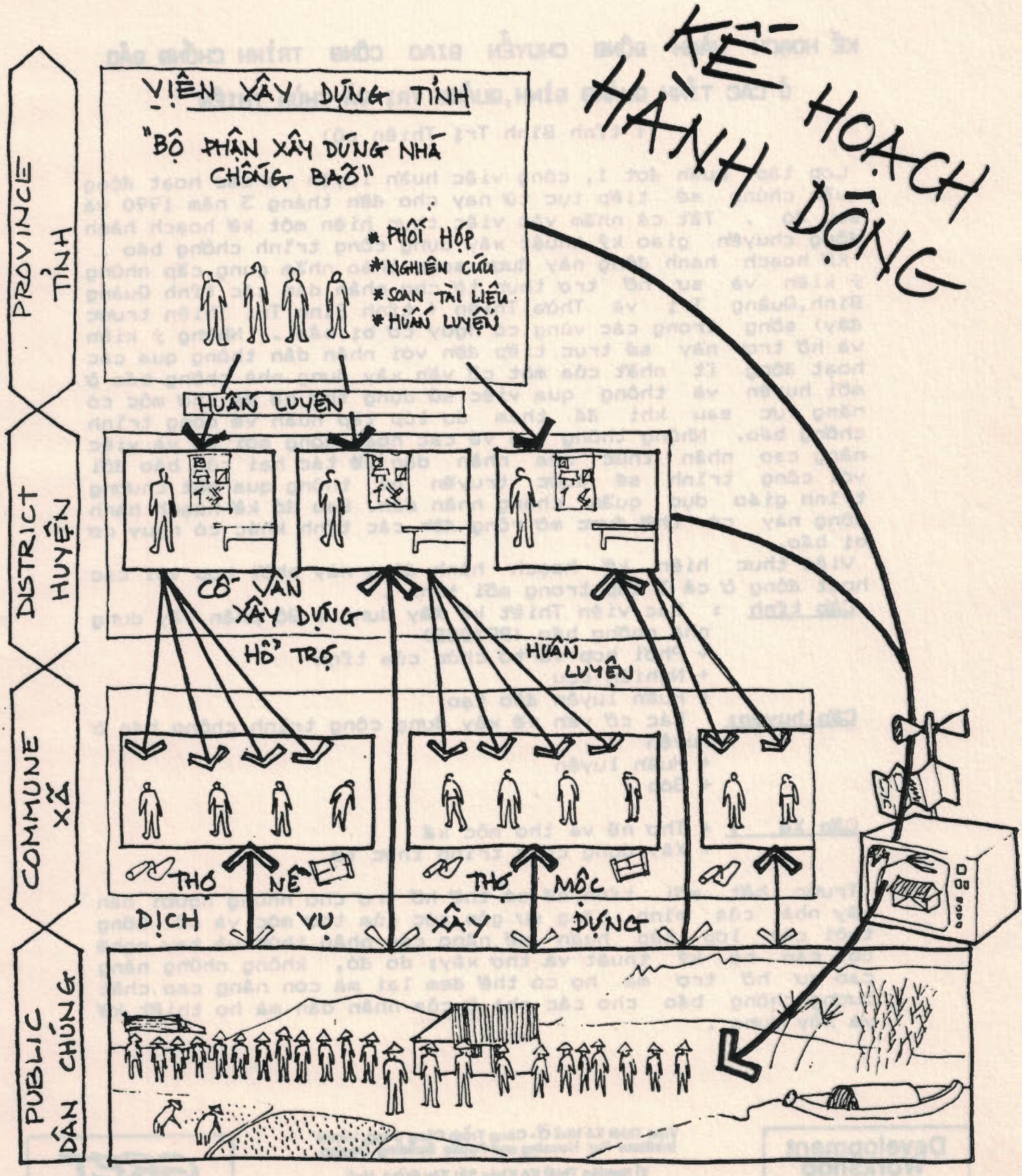
VIE / 85 / 019

# BIỆN PHÁP PHÒNG CHỐNG BÃO CHO NGÔI NHÀ CỦA BẠN




5
NEO CHẾ GỖ TƯỜNG VÀ
CỬA SỔ THÊM THANH CHỐNG CHÉO
CỬA BẰNG
NGANG
7
CỬA SỔ TOÀN NHỰT BẰNG NEO
VÀ CHỐNG Ở CÁC GÓC KHI CÓ BÃO
CHUẨN BỊ CHỐNG BÊN TRONG
8
LẮM TRẦN NHÀ CẦN THƯỜNG GIỜ TỐT LÊN MÁI
9
TRỒNG CÂY HÀNG RÀO CHẮN
TẠO VẬT CẢN GIÓ
KHI CÓ TIN BÃO LỚN
CÀNH CÂY LỚN Ở XA

## ANNEXE 6 / Action plan for demonstrating storm resistant building in QUANG BINH, QUANG TRI and THUA THIEN provinces (ex BINH TRI THIEN province)



# KẾ HOẠCH HÀNH ĐỘNG CHUYỂN GIAO CÔNG TRÌNH CHỐNG BÃO Ở CÁC TỈNH QUẢNG BÌNH, QUẢNG TRỊ VÀ THỪA THIÊN

( tỉnh Bình Trị Thiên cũ)

Lớp tập huấn đợt 1, công việc huấn luyện và các hoạt động quần chúng sẽ tiếp tục từ nay cho đến tháng 3 năm 1990 và sau đó . Tất cả nhằm vào việc thực hiện một kế hoạch hành động chuyển giao kỹ thuật xây dựng công trình chống bão .

Kế hoạch hành động này được soạn thảo nhằm cung cấp những ý kiến và sự hỗ trợ thực tế cho nhân dân các tỉnh Quảng Bình, Quảng Trị và Thừa Thiên ( tỉnh Bình Trị Thiên trước đây) sống trong các vùng có nguy cơ bị bão . Những ý kiến và hỗ trợ này sẽ trực tiếp đến với nhân dân thông qua các hoạt động ít nhất của một cố vấn xây dựng nhà chống bão ở mỗi huyện và thông qua việc sử dụng thợ nề và thợ mộc có năng lực sau khi đã tham dự lớp tập huấn về công trình chống bão. Những thông tin về các hoạt động mới đó và việc nâng cao nhận thức của nhân dân về tác hại của bão đối với công trình sẽ được truyền bá thông qua một chương trình giáo dục quần chúng nhân dân. Sau đó kế hoạch hành động này có thể được mở rộng đến các tỉnh khác có nguy cơ bị bão.

Việc thực hiện kế hoạch hành động này phối hợp với các hoạt động ở cả 3 cấp trong mỗi tỉnh .

**Cấp tỉnh** : Các viện Thiết kế Xây dựng : Bộ phận xây dựng nhà chống bão (BPXDCB)
+ Phối hợp và tổ chức của tỉnh
+ Nghiên cứu
+ Huấn luyện đào tạo

**Cấp huyện:** Các cố vấn về xây dựng công trình chống bão ở Huyện
+ Huấn luyện
+ Góp ý

**Cấp Xã :** + Thợ nề và thợ mộc xã
+ Xây dựng công trình thực tế

Trước hết mỗi tỉnh sẽ có thể hỗ trợ cho những người dân xây nhà của mình bằng sự góp sức của thợ mộc và nề. Đồng thời các lớp tập huấn sẽ nâng cao nhận thức và tay nghề của cán bộ kỹ thuật và thợ xây; do đó, không những nâng cao sự hỗ trợ mà họ có thể đem lại mà còn nâng cao chất lượng chống bão cho các nhà ở của nhân dân mà họ thiết kế và xây dựng .

The First Workshop Session and the training and public activities which will continue between July 1989 and March 1990 and beyond, all aim at putting into operation an Action Plan for Demonstrating Storm Resistant Building Techniques.

This Action Plan is designed to create a structure and the necessary expertise and material to provide advice and practical assistance to the people of Quang Binh, Quang Tri and Thua Thien Provinces (Ex Binh Tri Thien province) living in cyclone risk areas. Advice and assistance will be available directly to the people through the services in each District of at least one Building Adviser for Cyclone Resistant Construction, and through the private sector employment of masons and carpenters qualified after attending a training workshop on Storm Resistant Construction. Information about the new services and the raising of public awareness about cyclone damage to building will be disseminated through a public education programme. The Action Plan can later be extended to other Provinces facing cyclones.

The execution of the Action Plan brings together activities at three levels in each Province:

**PROVINCE**: Building Institutes: Cyclone Resistant Construction Unit:
* Provincial coordination & organization
* research
* training

**DISTRICT**: District Advisers for Cyclone Resistant Building (ACRB):
* training
* advice

**COMMUNE**: Local mason and carpenter:
* practical building

Each Province will be able to provide support primarily to the people who build their own houses with the services of a mason or carpenter. At the same time training workshops will raise the awareness and skills of technicians and builders, thus improving not only the assistance they can give, but also the 'Storm Resistant' quality of the public buildings they design and build.

## Provincial Level: The Building Institutes

The Building Institutes (IBID, Hue or its provincial equivalent in other provinces) will be responsible for the following activities:

* the establishment of a Cyclone Resistant Building Unit (CRBU) to coordinate all the activities listed below.

* the organization and operation (with IBID) of training workshops to establish:
a) a 3-4 person Core Team within the Institute CRBU who will be responsible for training building advisers and local builders; for monitoring the activities of the building advisers (ACRB) and builders after they are trained, and giving them help.

b) District Advisers (ACRB), using technicians working in the districts

* the development of teaching and technical materials, and their reproduction and dissemination. The dissemination of materials for the public education programme in coordination with other concerned organizations.

* the research and promotion of affordable Storm Resistant Construction techniques and materials.

The Institutes would be expected to coordinate their activities with other provincial and district organizations concerned with typhoons, for example, the People's Committee's Disaster Preparedness Committee, the Department of Construction, the Department of Culture and Information, and the local media network - radio, TV etc.

The IBID (Hue) Cyclone Resistant Building Unit's (CRBU) Core Team will be responsible for training the Core Teams in Quang Binh and Quang Tri.

## CẤP TỈNH : CÁC VIỆN THIẾT KẾ XÂY DỰNG

Các viện thiết kế xây dựng ( Viện thiết kế xây dựng Huế hoặc các viện tương đương ở các tỉnh khác) sẽ đảm nhận các hoạt động sau :

+ Thành lập một bộ phận xây dựng nhà chống bão ( BPXDCB) để kết hợp các hoạt động dưới đây :

- Tổ chức và điều hành ( với Viện thiết kế XD Huế) các lớp tập huấn nhằm thành lập :

a) Một tổ nòng cốt 3 hay 4 người nằm trong BPXDCB. Tổ này sẽ đảm nhận việc huấn luyện các cố vấn xây dựng và thợ xây địa phương ; đảm trách kiểm tra các hoạt động của các cố vấn xây dựng và thợ xây sau khi họ được huấn luyện và giúp đỡ .

b) Các cố vấn XD Huyện xử dụng cán bộ kỹ thuật đang công tác tại các Huyện.

+ Triển khai các tài liệu giảng dạy và kỹ thuật, in ấn lại và phổ biến các tài liệu đó. Phối hợp với các tổ chức hữu quan khác để phổ biến các tài liệu phục vụ chương trình giáo dục quần chúng nhân dân.

+ Nghiên cứu và bổ sung các kỹ thuật và tài liệu XD nhà chống bão đã có .

Mong rằng các viện sẽ phối hợp các hoạt động của mình với các tổ chức cấp tỉnh và huyện có liên quan đến chống bão,ví dụ : Ban phòng chống bão lụt của Tỉnh, Sở XD, Sở Thông tin-Văn Hóa và mạng lưới truyền thông địa phương (Đài phát thanh, Truyền hình...vv..)

Tổ nòng cốt trong bộ phận xây dựng nhà chống bão thuộc Viện thiết kế xây dựng Huế sẽ đảm nhiệm huấn luyện các tổ nòng cốt của tỉnh Quảng Bình và Quảng Trị .

## CẤP HUYỆN : CÁC CỐ VẤN XÂY DỰNG NHÀ CHỐNG BÃO

Tại mỗi huyện, ít nhất sẽ có một cố vấn nói trên hay nhiều hơn nếu có thể. Trước tiên, cố vấn đó sẽ là một cán bộ kỹ thuật chuyên trách ở huyện đó ( Ví dụ: trong phòng XD và công nghiệp công ty XD huyện, hoặc HTX Xây dựng) cán bộ kỹ thuật đó sẽ được tổ nòng cốt của BPXDNCB huấn luyện các kỹ thuật XD nhà chống bão và vai trò góp ý cho nhân dân cũng như huấn luyện các thợ xây địa phương. Lớp tập huấn sẽ bao gồm việc áp dụng vào thực tế những nguyên tắc thiết kế nhà chống bão trong khi thiết kế và xây dựng nhà ở của nhân dân địa phương.

CVXDNCB ở huyện sẽ điều hành từ trung tâm huyện và sẽ sẵn sàng đón tiếp nhân dân đến hỏi ý kiến và cấp phát những tài liệu thông tin. Người cố vấn này cũng sẽ cùng với tổ nòng cốt của viện thiết kế cấp tỉnh vạch ra việc tổ chức và điều hành các lớp tập huấn đặc biệt cho thợ nề và mộc địa phương về các kỹ thuật xây dựng nhà chống bão. Sau đó, người cố vấn này sẽ bổ sung thường xuyên danh sách các thợ xây mà anh ta có thể giới thiệu để nâng cao kỹ năng chống bão của họ ;anh ta sẽ giới thiệu cho nhân dân các thợ xây đã được huấn luyện các kỹ thuật xây dựng nhà chống bão. Anh ta sẽ áp dụng những hiểu biết về xây dựng nhà chống bão trong thiết kế và giám sát các công sở địa phương .

**District Level: The Advisers for Cyclone Resistant Building (ACRB)**

In each District there will be at least one ACRB, and more if possible. To start with, the Adviser will be a technician already working full time in the District (for example, in the Office of Construction and Industry, the District Building Company, or the Construction Cooperative). He (she) will be trained by the CRBU Core Team in cyclone resistant building techniques and in the role of providing advice to the population and training local builders. The training workshop will include the practical application of cyclone resistant design principles to the design and construction of a local public building.

The District ACRB will operate from the District centre, and will be available for people to come to him for advice and to receive information documents. He will also work with the Provincial Institute Core Team on the organization and running of special training workshops for local masons and carpenters on Cyclone Resistant Building Techniques. Afterwards, he will keep an up to date list of builders that he can recommend for their Cyclone Resistant Construction skills; he will recommend that people make use of builders qualified in Cyclone Resistant Construction techniques. He will also apply his Cyclone Resistant Construction knowledge to the design and supervision of local public buildings.

**Communal Level: The local builders**

The Core Team and the District Building Advisers will be responsible for running workshops for local carpenters and masons on Cyclone Resistant Building Techniques. For example, these workshops could typically be organized as an extension of the training that builders can receive through the building cooperatives. Workshops will also be organized for independent builders. A certificate will be awarded on successful completion of a workshop.

The local builders play an important role: except for the very poorest people, the majority of people engage the assistance of carpenters and/or masons in the construction of their house. The aim of the programme is thus to bring increased awareness amongst builders about Cyclone Resistant Construction techniques, and to see it being applied in the practical advice and work (design, choice of material, detailing) that they carry out for house building, and in the quality of their construction work on public buildings.

Schedule of Activities for the introduction of the Action Plan in Quang Binh, Quang Tri and Thua Thien Provinces.

The attached table shows the sequence of activities in each of the three Provinces, from June 1989 until April or May 1990. Based on the Action Plan described above, the intention is to have a Core Team and District Building Advisers trained in each province. Before the start of the typhoon season in 1990, each province should have completed a full cycle of training, and have launched the start of the public education programme which will raise public awareness about cyclone resistant building and inform the people of the presence of the District Building Adviser and of qualified builders in their commune.

* Binh Tri Thien province has recently been divided into three new smaller provinces, representing the north, centre and south of the old province. The new provinces are Quang Binh (north), Quang Tri (centre) and Thua Thien (south). The Phase 1 seminar/workshops, at Phu Loc, has thus taken place in what is now Thua Thien Province, in existence since the 1st July.

## CẤP XÃ : CÁC THỢ XÂY ĐỊA PHƯƠNG

Tổ nòng cốt và các cố vấn XD Huyện sẽ đảm nhận điều khiển các lớp tập huấn cho các thợ mộc và nề địa phương về các kỹ thuật nhà chống bão .Ví dụ,các lớp tập huấn này có thể được tổ chức tiêu biểu , coi đó là sự mở rộng việc huấn luyện mà các thợ xây có thể tiếp thu thông qua các HTX Xây dựng. Các lớp tập huấn cũng sẽ được tổ chức cho các thợ xây tư nhân. Sau khi tham dự đầy đủ lớp tập huấn, mỗi học viên sẽ được cấp giấy chứng nhận.

Các thợ xây địa phương đóng một vai trò quan trọng : trừ những người dân thực sự nghèo. Đại đa số nhân dân sẽ được sự giúp đỡ của thợ mộc hoặc thợ nề trong khi xây dựng nhà ở của mình. Do đó mục tiêu của chương trình giáo dục nhân dân này sẽ mang lại sự nhận thức cao hơn trong các thợ xây về các kỹ thuật xây dựng nhà chống bão và sẽ theo dõi chương trình này được áp dụng vào việc góp ý và xây dựng nhà chống bão trong thực tế ( thiết kế, chọn VLXD, các chi tiết của công trình) mà họ thực hiện trong xây dựng nhà ở và trong chất lượng công trình xây dựng công sở.

## LỊCH TRÌNH HOẠT ĐỘNG ĐỂ ĐƯA KẾ HOẠCH HÀNH ĐỘNG NÀY VÀO 3 TỈNH QUẢNG BÌNH,QUẢNG TRỊ,THỪA THIÊN.

Bản lịch trình hoạt động kèm theo cho thấy các hoạt động liên tiếp trong mỗi một tỉnh từ tháng 6/1989 cho đến tháng 4 hoặc 5 /1990 . Dựa trên kế hoạch hành động đã được trình bày trên, một tổ nòng cốt và các cố vấn XD huyện sẽ được dự định huấn luyện tại mỗi tỉnh. Trước khi mùa mưa bão năm 1990 đến, mỗi tỉnh phải hoàn tất một chu kỳ huấn luyện đầy đủ và phát động khởi đầu một chương trình giáo dục quần chúng nhân dân. Chương trình này sẽ nâng cao nhận thức của nhân dân về công trình chống bão và thông tin cho nhân dân biết về sự hiện diện của cố vấn xây dựng huyện và về các thợ xây có tay nghề xây dựng nhà chống bão tốt trong xã của họ.

DW/GRET

Huế,ngày 13 tháng 06 năm 1989

# ANNEXE 7 Documents prepared for the workshops

## 1. Documents prepared for the worshops

Dossier "Basic information", 106 pages, 50 copies
Dossier "Manuals" 47 pages, 100 copies
Dossier "Indigenous building", 48 pages, 25 copies
Dossier "Demonstration building L.D. primary school" 24 pages, 50 copies.
Presentation of session 1, 5 pages, 100 copies
Presentation of L.D. primary school 5 pages, 100 copies
10 key principles 4 pages, 100 copies
Exhibition IFBPD (Hanoi)/IBID, 50 pages, 10 copies

## 2. Documents of the workshops

Loc Dien primary school 16 pages, 100 copies
Action plan 9 pages, 100 copies
Results of working groups 42 pages, 100 copies
Certificate 80. Covers 100
Video films :"My husband builds our house" 17'. 2 copies (IBID, PHU LOC) VHS.
Photos of the participants 50 copies

## 3. Documentation on cyclone resistant building techniques

Hurricane resistant structures in the Caribbean, MRE-GRET, 1985,106 pages.
Construction d'une école en Dominique, GRET, 1981, 32 pages.
Improvement of low cost housing in Cook Islands to withstand tropical storms, INTERTECT, 1982, 72 pages.
Manuals from INTERTECT : How to strengthen a Salomon Island House. Improving a nog house. Will your house stand up ?
Isaac destroys Tonga schools, Unesco, 1982, 17 pages.

## 4. Documentation on traditional architecture.

Esquisse d'une étude de l'habitation Annamite, P.Gourou, Paris 1936, 78 pages
Habitation vietnamienne: Relevés et commentaires, Ding Trong Hieu, CID Vietnam-Paris, 1985.

## 5. General documentation from GRET

Gret-Habitat, 10 ans d'acitivité, 1987
Dossiers Laos : Construction of Naxaythong Primary School, 1985, 18 pages. Construction of Pakkading Hospital, 1989, 29 pages. Training Programme ETSB, 1988, 50 pages
Social appropriation of indigenous building materials, MRE-GRET, 1985, 43 pages
Monograph on Nazareth project (Ethiopie)
Small scale cement plants, ITDG, 27 pages
Use of Rice husk, GRET, 60 pages
Briques et tuiles, GRET 47 pages
Toitures végétales (thatch), GRET, 118 pages
Le cocotier, 149 pages
Le rônier /Palmier à sucre, 92 pages
Bioclimatism in tropical area, 173 pages
Proceedings of Inter Caribbean workshop on low cost housing, 128 pages.

## 6. General documentation from Development Workshop

Building with earth, a Hand Book, J. Norton, ITDG, 1986
Manuel de construction parasismique en Guinée, DW, 1986, 55 pages
Manual for constructing a community building, DW, 1986, 130 pages.
Manual for Senegal: Construisons notre école, DW, 1988, 58 pages
Entretenons notre école, DW, 1988, 58 pages

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Social appropriation of indigenous building materials, MIFE-GRET, 1986, 40 pages
Monograph on Nazareth project (Ethiopia)
Small scale cement plants, ITDG, 27 pages
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Entretenons notre école, DW, 1988, 58 pages