Assisting the development of popular capacity to prevent typhoon damage to housing in Central Viet Nam

by

Alternatives & Development Workshop

Final report

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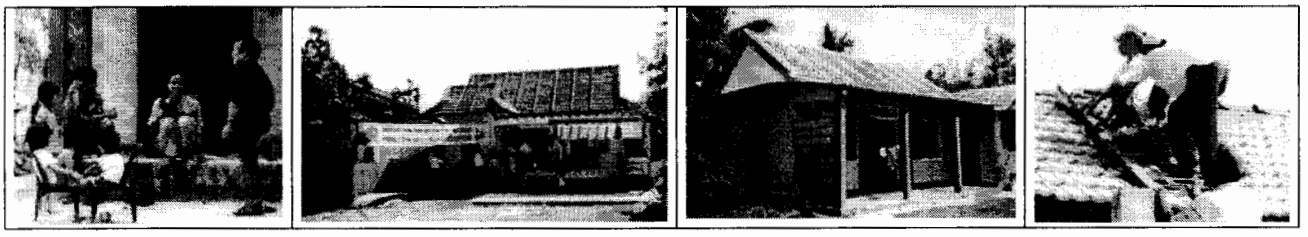

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1. OVERVIEW

The nature of the problem, its evolution during the project and the present situation

Over the past decade, Viet Nam has been emerging from years of poverty. Economic reforms have had a largely positive effect on many families, whilst many activities are increasingly moneterised. This growth and change is vital if families and the community are to achieve more stable and better living conditions. In turn, the improvement of family economies is vital for local and regional development.

But the often-tenuous improvement in family and commune conditions is frequently eradicated by the destruction caused by the annual round of storms, typhoons and flooding.

In effect, amongst the many changes in the past decade, a tangible change has been the increase in private expenditure in housing and small-scale rural infrastructure. Families have rebuilt a vast percentage of rural housing over recent years to replace previous thatch and bamboo houses.

Regrettably, this investment in new homes has not been matched by a parallel increase in their resistance to the effects of floods and storms. This weakness is largely because storm resistant building details have been neglected. On the narrow coastal plain of central Viet Nam, the greater investment in building paradoxically means that *vulnerability* to storms and typhoons has increased significantly because there is considerably more family and community investment at risk of loss in each disaster. On the basis of surveys we estimate that up to 70% of rural houses and facilities are at risk from damage in storms. And whilst it is difficult to provide protection against the massive "100 year" typhoons such as hit Viet Nam in 1985 and again in 1997, damage from the more frequent annual storms can and should be largely avoided.

Storm related disasters in central Viet Nam are an annual catastrophe with 4 or more typhoons hitting the coast each year, as well as more frequent less damaging storms and often severe flooding. The loss and damage to the home that results is a major set back to families and the community. Repairs and reconstruction seriously divert resources and capacity away from the potential for economic growth and development.

This level of vulnerability is unnecessary. Preventive action to strengthen community and domestic buildings is an effective and cost efficient manner of reducing economic and material vulnerability, and families and communities can do it themselves.

Comments

This is an ongoing climatic and economic problem, where poverty reduction is strongly linked to the impact of disasters on vulnerable families. It is a problem that cannot be resolved in response to a disaster event, but only as a long-term strategy of prevention.

2. THE PROJECT

a) Participants and Beneficiaries

The project targets rural and peri-urban coastal populations in the central provinces of Viet Nam. The beneficiaries are poor and vulnerable families whose homes are at risk of storm damage, and are estimated to represent up to 70% of the population. Average family incomes are about 30$ US/month (or less) against an average cost per m² of 20 - 30$ for a typical 35 m² house.

The project has worked in ten communes with a total population of 100 000, and many of the project activities have reached out directly (animation) or indirectly (demonstration effect on individual buildings) to this overall population. The project has transmitted a message to a larger population through TV reporting on its activities.

Direct participants and beneficiaries have included the members of 222 families whose houses have been strengthened with the project. In addition, the project has provided training to an average of 40 construction workers in each commune (10 x 40), and has established and trained and closely worked with 10 Commune Storm Damage Prevention Committees whose members are largely drawn from the People's Committee of the communes, village elders, and representatives of the women's and farmer's unions. The project has worked with the primary school population in each commune and 400 teachers have participated in training workshops to integrate the project theme into schools. Many of the commune kindergardens and some primary schools have been strengthened with project help. In general, although levels have varied in different communes, the animation activities have included construction workers, village and community leaders, teachers, school children and their families (See Table of Outputs 3.2).

40% of beneficiary families have been headed by women.

Several larger public demonstration projects (markets, safe port) have also provided the opportunity to bring together a large group of people to work with the project on demonstration of damage prevention methods.

The project has worked with counterpart staff drawn from the Construction Design Consulting company in Hué, and has collaborated with representatives of the People's committees of the province and the districts, as well as the Provincial Committee for Flood and Storm Prevention. Seminars and workshops have also targeted regional decision makers.

Direct beneficiaries include the projects own local staff who has been trained during the project. One of these is now going on a scholarship for postgraduate education on engineering and typhoon resistant construction based on his experience with the project.

b) Duration.

The project duration was from March 1999 until the end of February 2002.
The project has operated during the foreseen period.

c) Methodology.

Planned methodology	*Methodology currently adopted*	*Reasons for change*
The project accent is on exchange and communication with the population so that in each village animation activities work to stimulate short term and long-term awareness of the need to take preventive action, while the practical strengthening demonstrates how preventive action can realistically be applied on existing buildings.	As planned	No change
The project is based on establishing and training of a core project team, and two mobile field teams.	The project team worked as one team, with a sharing of responsibilities in the communes.	Project was based on one province; this use of resources more efficient.
These teams are to undertake a four stage programme of activities in selected pilot communes:	After the pilot communes phase in 2000, the project has in addition strengthened participation actions at different levels.	It was important to develop mechanisms to promote participation.
Assessment of vulnerability and strengthening needs Undertaking a village/household level building vulnerability assessment with the community and an evaluation of the resources, materials and techniques and strategies that can be employed to make the settlement and its buildings safer and more storm resistant.	As planned In each commune, vulnerability, building styles and resources, and needs were assessed, and a programme developed with commune partners. Assessment has been ongoing through project life.	No change
Village animation The teams will then develop and adapt a programme of village animation to increase popular recognition that home strengthening is a necessity that can be achieved realistically can exploit such channels of communication, and the audience will remember such "messages" long after the event.	In each village animation/awareness raising activities took place to convey the message to all the community on the need for preventive action. These included public theatre, workshops with schools, public radio, posters and more to stimulate short term and long-term awareness of the need to take preventive action. Animation activities also took place at provincial level using public media and methods develop in the communes.	As well as working in the communes, the seminars in Hué and collaboration with the local press and TV have help attract a province wide audience.
Promoting key principles of typhoon-resistant building In parallel to the village animation activities, in each community participant families will be identified, who will benefit from a practical demonstration showing how their house can be made stronger. Funds are available to finance these integrated and interactive demonstrations.	The project collaborated with families in the practical strengthening of their own houses which directly demonstrated how preventive action could realistically be applied to existing buildings. The project provided a subsidy to help families undertake the work; families contributed in cash and kind.	
	Demonstration work on small public buildings The project brought together groups of people for training and demonstration activities that benefit the community as a whole, such as restoring and strengthening kindergardens, schools and local markets.	Working on strengthening kindergardens, schools and markets using the same techniques used on houses has a) demonstrated the approach to a wider audience including children; b) consolidated the engagement of the People's Committees.

Follow-up Each village or locality will be visited on repeated occasions, several weeks after the first intervention, and again to provide more support, to remind people of the message, and to help other people building or repairing their homes.	Animation activities and support have been maintained on a regular and ongoing basis in the communes.	Repetitive animation activities were considered important.
	Participation: The project worked to develop a participation environment directly with the inhabitants in the communes, as well as with all levels of local authority in the province. This included developing more village level participation in beneficiary selection.	It was important to create a context for different types of participation that could be integrated into existing local government practices.
	Public review: At the end of each stage in the project, a workshop or seminar gathered representatives from villages, communes, districts and provincial authorities, and specialist services. They reviewed work done and express opinions about the way to proceed.	The review workshops provided an important opportunity for province, district and commune representatives to contribute ideas, review work, and take on a sense of ownership of the project.
	Local management: The project first established Commune project management committees, which then were developed into Commune Storm Damage Prevention Committees. All the committees met together monthly to exchange.	There was a need for a specific counterpart structure in each commune. The commune Storm Damage Prevention Committees have played an important part in the project, and much depends on their level of motivation.
	Phased Expansion: The project adopted a phased expansion of the work from pilot communes to communes spread though all the coastal districts.	The project worked first in three pilot communes, which served to illustrate the project approach, and then expanded to a total of ten communes, covering all coastal districts. This was to help appreciation of the project's approach.
Identifying other initiatives In the course of visits to the villages, and in collaboration with the local committees, the team will also identify other actions needed to make the environment safer.		

Adequacy and lessons learned

The initial methodology was if anything cautious, with a strong emphasis on demonstrating technical issues and the communication methods that were needed to make people aware of the need to take preventive action and how this can be done. The methodology needed to be more explicit on the development of social and institutional approaches that would complement the technical and communication component. Once activities in the communes began this component was worked into the project. During the life of the project, active steps have been taken to develop the opportunities for participation in project activity decision making and this has contributed to the appropriation of the projects objectives and activities by people in the communes.

The beneficiary assessment process was too top down at the beginning, but as confidence has developed in the commune/project relationship, the project has worked to make this a more village-based process with clearer criteria for choosing families.

3. RESULTS

3.1. Progress toward the achievement of objectives

Overall objectives	*Modifications*	*Results*	*Variances*	*Verification*
Mobilise the vulnerable population of the Central region of Vietnam (Quang Nam et Quang Tri Provinces, and Danang City) to effectively take efficient preventive measures to strengthen their homes at risk from typhoons, with the following aims:	Target province changed to Thua Thien Hué Province	Project successfully mobilised the vulnerable population in ten communes of Thua Thien Hué province, to take efficient preventive measures to strengthen their homes from risk of damage by storms and typhoons where it has worked in ten communes.	Small: overall target zone remains the same	External Evaluation, May 2001; 6 monthly progress reports
1. Modify the attitude and the practices of the people, of skilled workers, of technicians, and of decision makers so that prevention becomes a priority in construction.	None	In the communes, through animation, demonstration and training, the project has contributed to modifying attitudes and practices. The attitude of decision makers in the province has changed since 1999, and there is good recognition of the viability of preventive strengthening.		See: External Evaluation, May 2001; Evaluation by the People's Committee, TTH Province; Evaluation by the Committee for the Prevention of floods and storms, TTH Province
2. Ensure that housing is strengthened	In addition, strengthening work done on small public buildings.	222 houses have been strengthened in 10 communes; 16 public buildings have been strengthened such as kindergardens and markets.	The project worked on strengthening existing domestic *and* public building small public facilities.	See: Activities 2002 – 2001 report; "Fiche de présentation" for each commune.

Immediate objectives	*Modifications*	*Results*	*Variances*	*Verification*
1. At local level with commune / inhabitants To mobilise the population to take preventive action which is economically, technically and socially realistic, through awareness-raising activities, demonstration on individual housing, with community and family participation, in differing contexts (coastal area fishing villagers, and a peri-urban population): ❑ To reconstruct damaged housing, using more typhoon resistant techniques ❑ To consolidate existing "transition" housing (which uses both traditional and modern materials) ❑ In include the basic principles of		The project has mobilised the population to take preventive action which is economically, technically and socially viable. ❑ The project has developed and used a range of awareness raising activities from posters to theatre, as well as working in schools. ❑ It has demonstrated the strengthening of 222 houses (against 200 planned). ❑ Families have contributed both money and labour for strengthening their homes; but many have borrowed to do so; contributions covered 40% of strengthening costs. ❑ Working on existing houses meant that these buildings reflect family socio-cultural needs. ❑ It has strengthened and rehabilitated 16 public facilities; the communes contributed 27% of the costs.	More buildings have been worked on than planned. There has been a good level of beneficiary contribution. Work on strengthening public building increased	"Etudes de cas des familles bénéficiares du projet" (V & F) July 2001. "Reportage TV Hué"; Programme de la Campagne de Prévention (V&F) "Dossier Formation/Ecoles", April-May 00 "Fiches Habitat" (V) "Tableaux de synthèse" " Avancement Travaux, 31 jan 2002" "Suivi Comptable Amélioration Habitat 31-12-01"

cyclone-resistant building in new construction		❑ It has provided training for some 400 builders in order to include the basic principles of cyclone resistant building into new and existing construction. ❑ A damage prevention manual has been produced for builders.	visibility.	"Manuel de construction anti-cyclonique" 60p Dec 2001
2. At Province level To assist the Storm Damage Prevention Committees to develop ways of helping the most affected section of the population (the poor), through technical and communication training		The project has officially established Commune Storm Damage Prevention Committees (SDPC) in each commune, and provided training in communication/animation skills and technical training; these Committees have become the key elements in the management of the project. Close relations have been maintained with the Province Flood and Storm Prevention committee which has participated in all Province level workshops.		See: "Organisation du Comité" and "Décisions des Comités Populaires" Mars 2000, & Nov 2000
3. At national level To develop and strengthen the inclusion within strategies of the need (and the possibilities) for prevention amongst the sections of the population most affected by typhoons		The project has participated in central Viet Nam, national and regional workshops to present its strategies, and interest has grown.	More time is needed to fully achieve this objective.	See: "Minutes de la Réunion" May 2001; "Compte rendu" oct 2001 on Hanoi meeting on Safe Shelter.
4. Feasibility studies of specific projects Loans to strengthen housing Protection programmes (e.g. safe harbours...)		Projects identified allowing a greater impact on damage prevention include: ❑ Development of credit system for house strengthening; ❑ Development of family Damage Prevention Groups in commune hamlets and strengthening of Commune Storm Damage Prevention Committees. ❑ Risk mapping for the communes. ❑ Support for the provision of adequate roof fixings.		See: Project specific proposal documents

3.2. Outputs

	Total
I/ Animation	
Communication	
Panels	34
Posters	2 500
Construction handbook on Cyclone resistant construction	1 000
Leaflet	4 000
Fan	3 000
Cap	800
Raincoat	400
Calendar	200
TV report	1
Newspapers articles	2
Schools	
Drawing competitions	3
Pupils parades	13
Shows (songs, poems, theatre)	10
Public prevention campaign (2 weeks)	1
Monthly meeting Communes Storm Damage Prevention Committees	8
II/ Training – exchange	
Commune	
Teachers	10
Builders	12
General	
Workshop	3
III/ Strengthening houses and public facilities	
Houses	222
Public facilities	16

4. IDENTIFICATION OF TARGET GROUPS AND RISK

a) Target groups who directly benefited from the project results

General		Specific	
	IDPs	X	*Children*
	Refugees	X	*Youth*
X	*Victims of Natural Disasters*	X	*Elderly*
	Other	X	*Women*

The principle target group has been poor and vulnerable families[1] in the coastal plains of central Viet Nam, who are regular victims of natural disasters. They are at risk from having their house destroyed or damaged, and their investment in building, building materials and possessions lost. As a side note, the intimate link these communities have to farming and fishing makes the option of relocation an often-difficult one to implement successfully. For the majority, reducing people's vulnerability where they are is thus important.

More specifically, within the overall target group, the project has also worked with different groups within the communes.

- The project has worked directly with children in kindergardens and primary schools:
  - Firstly by working with teachers to introduce the theme of storm damage and preventive strengthening (an average of 40 teachers per commune were trained);
  - Secondly by activities with the children, including painting competitions and participation in parades and concerts;
  - Thirdly by strengthening many of the kindergardens and primary schools in the ten communes, thus demonstrating the techniques that can be used.

  School involvement in the project has therefore been important and enthusiastic.
- The project has worked with youth in the communes by providing practical training and discussion sessions on the issue of damage prevention and on the techniques that can be used by the building brigades that exist in each commune.
- The project has worked with many of the elderly, since this group are most often amongst the most vulnerable in the community and many of them have had their houses strengthened. Community elders and traditional leaders have been involved in debate in the villages during beneficiary selection processes and choices of public buildings in their village.
- The project has worked directly with women; 40% of the beneficiary households are headed by women, and women have been active in their villages in sharing their experience of the project intervention with their neighbours. The women's union is represented on the Storm Damage Prevention Committees and helps in mobilisation.

b) Major risk factors and how they influenced the results.

In the Vietnamese context, the project has been innovative. It has promoted ideas that were originally considered with both some scepticism and some high level concern (about 'animation') at the start of the project.

[1] *The poor are classified as those who cannot satisfy the bare necessities of life, and in 1998 were considered by the VN General Statistics Office to number 39% in South Central VN and 51% in North Central VN; a larger proportion are classified as « temporarily poor » meaning families whose income fluctuates above and below an acceptable minimum level. GSO VN 1999.*

- Firstly, the notions of 'village level animation' and that of the 'development of popular capacity' were sensitive. Discussions in 1998 and 1999 helped explain the detailed approach that was to be taken and to convince the senior provincial authorities that this was not a 'subversive' activity.

- Secondly, in general terms, the idea of strengthening existing rural houses – considered by some senior officials to be weak and *unusable* – was not considered to be serious, and as a result, the size of the budget was not considered adequate to allow the building of *new* 'storm resistant houses'. On this basis the project was not accepted by the President of the People's Committee in Da Nang and Quang Nam provinces, which belied a much clearer expression of interest by the Committees for Flood and Storm Prevention. The project management team also responded by making internal adjustments to the budget to increase the allocation of funds direct to beneficiaries.

  The project was accepted in the central province of Thua Thien Hué where Development Workshop had previously worked.

  These start-up problems were resolved once activities began in the communes and within 6 months, by the time of the first seminar in June 2000, with visible and tangible results on the ground, widespread acceptance of the project approach and validity had been achieved at commune and province level. In 2001 the Regional Representative of the National Committee for Flood and Storm Prevention took part in a workshop and expressed the wish that the project extends to all central provinces.

- Thirdly, the flooding in the central provinces in 1999 increased the presence of relief organisations and the amount of aid given to this area over a short period. The free or almost free donation of core buildings and building materials meant that some of the population came to expect handouts in 2000. This made the process of encouraging people to strengthen and improve their own houses and to contribute to the costs of doing so slightly harder in 2000. Overall, greater consistency of approach can reduce the negative effects of different offers in the same locality.

The difficulties in the establishing the project at the beginning meant that two of the central Viet Nam provinces did not benefit directly from the project, whilst Thua Thien Hué Province did.

In overall terms these risks/difficulties did not affect the outcome of the project. It has been the aim and the challenge of the project to demonstrate that preventive strengthening is viable and that this can be encouraged through capacity development and animation, and this aim has been effectively achieved.

5. PERFORMANCE FACTORS

a) Timeliness

The start up period in 1999 was slow because of the time it took to get local institutional agreements signed for the specific project. But once these agreements had been concluded, the programme has been initiated without any overall delays.

b) Relevance and response to the needs of the region and the main beneficiary

Evaluations by the People's Committee of the Thua Thien Hué Province, the Committee for Storm and Flood Damage Prevention, and interviews with beneficiaries all indicate that the project has responded to the needs of the central Viet Nam region and to those of the beneficiary groups (See Annexe 1,2). A criticism has been that the project should be carried out on a larger scale to be able to reach more people. Family case studies [2] and the external evaluation[3], indicate that the beneficiaries, the commune representatives, builders and teachers have all appreciated the project approach and what it has brought them.

c) Appropriateness

Given the local context were project resources, capacities, and selected strategies sensible and sufficient to achieve intended result?

Yes.

Human resources and capacities have been sufficient to achieve the majority of intended results, as were the strategies that have been adopted.

Within the target communes the financial resources available were adequate although commune representatives would have like to see a greater number of families assisted by the project. For this at least, the overall size of the budget was *rightly* considered small by provincial and local authorities who nevertheless have recognised that contrary to their original expectations a great deal has been done and demonstrated.

The selected strategies seem to have been suitable to achieve the intended result. The external evaluation in April 2001[4] indicated « the project's objectives and methodology have been highly appreciated [by the Commune Storm Damage Prevention Committees] for a better comprehensive programme bringing together animation/communication activities, and for technical training for different groups and material support for families ».

d) Cost-effectiveness, efficiency and effectiveness

Yes.

The project has been run in an efficient and effective manner. The external evaluation in March 2001[5] remarked being "impressed by [the] systematic management of the working process in the project office, where access to documentation and reports have made it easier to cover the whole project process".

The project has been organised to encourage the participation of all staff members in planning decisions; weekly meetings have been held throughout to plan and review; similarly monthly

[2] *Lam Ngoc Mai « Études de cas des familles bénéficiaires du projet » ENDA HCM City, July 2001, 20 pages*
[3] *Tran Thi Minh Chau « External Evaluation » May 2001*
[4] *Op. cit.*
[5] *Op. cit.*

meetings have been established with the Commune Storm Damage Prevention Committees for activity review and planning.
Accounts have been promptly rendered to the implementing organisation on a monthly basis.

Practical targets for house strengthening have been met in a timely manner, and the project team has shown itself to be very efficient in organising commune and province level events. The project has developed a substantial database generated out of the field studies and monitoring of activities. For overall detail and evidence see '"Tableaux de synthèse" ; « Avancement Travaux, 31 jan 2002" and "Suivi Comptable Amélioration Habitat 31-12-01" and documentation referenced in « Avancement Travaux ».

Cost-effectiveness

More has been achieved with the project budget than planned. For example, 222 houses strengthened instead of 200; 16 public facilities strengthened where none were planned, and some 400 teachers and 400 builders received training. The average value of project contribution to houses strengthening was 420$ US in the pilot phase (up to June 2000) and 250 $US by house, with a rationalisation of the strengthening work that was undertaken and an increase in the beneficiary contributions.

e) Stabilisation

Did project activities assist in the stabilisation of affected groups ?

Yes, the aim of the project has been to reduce vulnerability to house damage. The project has been effective in helping families make sure that their house is not at risk and through this that their family situation becomes more stable. Beneficiaries talk of the psychological benefit of feeling that their house is finally safe, and feel, for example, that they can turn their attention to the schooling of their children (a priority).

f) Co-ordination of activities with work of other groups in the area

Yes, to some extent:

i) The project has regularly invited representatives from other organisations (Canadian Embassy, Viet Nam and International Federation of the Red Cross, CECI, EU, Oxfam, CARE, Action Aid...) and government representatives to participate in workshops organised in Hué by the project, to share and exchange views on its experience;

ii) The project has hosted visits by the participants to the South East Asia Disaster Management Practitioners Meeting in November 2001;

iii) The project has participated actively in forums for exchange in Hué (for example those organised by the VN and IF Red Cross) and in Hanoi (ADPC, CISP..

iv) Participation in the Community Based Disaster Management Course, ADPC-DIPECHO, September 2001.

One is nevertheless aware that where there are different approaches to the issue of reducing vulnerability, the most common being to build new houses or core houses for, and sometimes with, families. Coordination and practical collaboration are not always easy to achieve, and there is room for improvement through the NGO networks and within the provinces. There are regional initiatives that are trying to do this, and the project and the implementing organisation are affiliated to these.

g) Participation

Beneficiaries' involvement in decision-making, design, delivery and or monitoring of the project.

Beneficiaries have been involved in decision making and delivery of the project activities; commune representatives have been actively involved in decision making, activity design and monitoring activities. The project has been based on community participation at a variety of levels (beneficiary families; neighbourhood elders; People's Committee + Women's and Farmer's Unions), and these and family participation have on the whole worked well, although the degree of participative decision making varied to some extent from one commune to another.
Participation was slightly weak in the first months of the project, but this aspect of the project approach was progressively strengthened as people in the communes became familiar with the projects activities and greater beneficiary participation became an issue that could be discussed and developed with the commune committees. In effect, after the pilot phase, in the extension phase from November 2000, families were responsible for the monitoring of the work on their house, and also participated a great deal in the design of the work to be done on their house.

6. MANAGEMENT PERFORMANCE FACTORS

Management and factors which influenced results achievement.

a) Communications

The Canadian public will be informed, in both French and English, of project activities and CIDA's contribution through Alternatives' monthly newspapers (circulation approx. 150,000), its Web site (and affiliates: One World-Canada, Centre de médias alternatifs, Forum mondial des alternatives), its direct mail appeals to 30,000 previous donors and 100,000 prospects annually across Canada, and its dev-ed activities in Quebec, conducted jointly with members of the local Canadian Vietnamese community through their organization Fonds d'aide Vietnam-Canada.

b) Innovation and creativity

Exploring and implementing new and innovative ideas or approaches to achieve its objectives.

A variety of features of the project have been innovative and the project management have been active in exploring new ideas to achieve the project's objectives.
Ideas that have been new in Viet Nam can be summarised as:

- that it is possible for families to strengthen their existing buildings and that this is economically viable;
- that dynamic and engaging animation in which the local population takes part contributes significantly to making people conscious of the message being delivered and remembering it. The project has harnessed a wide variety of local communication opportunities: people in the communes writing poetry about the project theme and singing it; putting on plays on prevention; renting 50 year old Renault bus to tour the region with slogans and handouts, printing fans, mackintoshes; having competitions for local builders and school children about damage prevention...

The staff and commune partners have maintained an ongoing discussion about ideas that can be used to advantage to help convey the project message, and this has generated considerable local

engagement and pleasure.

c) Informed and timely action

Were there any changes/challenges or constraints in the project's operating context? Did project management anticipate and respond to constraints or changes?

Yes there were initial challenges in the project-operating context when the first two identified provinces (Da Nang and Quang Nam) did not accept the project in early 1999 despite previous expressions of interest.
The project management relocated the project to another Central Viet Nam province (Thua Thien Hué) which faces identical natural disaster problems, and the project management made internal adjustments to the budget to increase the amount being spent directly in the communes and with beneficiaries as a proportion of the overall budget.

The project management had previously surveyed 5 central Viet Nam provinces (including Thua Thien Hué) to assess local attitudes and the evolution of housing and strategies since 1989.

d) Appropriate human resource utilisation

The project management assembled a local Vietnamese team of technicians and community animators, gave them training in all aspects of the project, and they have worked extremely well.
In turn the project established Commune Storm Damage Prevention Committees (CSDPC) drawing on community representatives, and provided these committees with training, and they have gone on to play an important community mobilisation, coordinating and beneficiary support role.
Training has been given to construction workers within the commune so that they know about storm resistant building techniques, and they have in turn provided practical help in the demonstration activities on small commune buildings and beneficiary houses. Training has been given to teachers to help take the message into the schools.

e) Risk and strategies for managing or minimising exposure.

Yes, there has been a risk that in the event of a major disaster such as the high flooding in 1999 many humanitarian aid organisations would come in the project area and provide housing or core houses either as a gift or for a nominal contribution, thus reducing motivation by families to actively participate and contribute to the preventive strengthening their own existing homes. The project strategy has been three fold:

- to demonstrate that preventive strengthening of a family's existing house responds to very local social and cultural needs as much as to technical needs;
- to develop an ongoing relationship between the commune, vulnerable families and the project staff that has *not been related to short term crisis response*;
- through communication, work to convince the community that preventive strengthening of their homes is something they can and should do.

t) Monitoring by different partners and beneficiaries

Monitoring has been at several levels, and both internal and external to the project.

- Alternatives have undertaken annual monitoring missions and monitored on an ongoing basis;
- the overall project was monitored daily by the implementing partner Development Workshop through its project coordinator and through regular missions by DW Canada Director, John Norton;
- in the communes the project counterpart, the Storm Damage Prevention Committee, has

monitored activities that have taken place in their commune. The project has also been monitored by the People's Committee of the Province.

- Most important, the beneficiary families, who have signed participation agreements with the project, have monitored day-to-day work on the strengthening of their homes, as well as contributing to the work, costs and design.
- The project has been visited by professionals from the South East Asia Disaster Management Workshops.
- An external evaluation was undertaken at the request of Development Worksop in April 2001 by Tran Thi Minh Chau.
- In January 2002, as part of the external evaluation of CIDA IHA's prevention programme, a CIDA mission also visited the project (Catherine Gander & colleague).

7. LESSONS LEARNED

a) Lessons learned

i) ***Current Viet Nam strategies***

There are signs that the strategic environment in which the project operates is evolving, and this increases opportunities for the project message of preventive strengthening to be adopted, which is a primary objective of the project and needs reinforcing. The Viet Nam Comprehensive Poverty Reduction and Growth Strategy paper [6] states that one should "*Help the poor to take preventive measures against and fight effectively natural disasters such as storms, flood, drought, pests, etc. by* organising *training, and transferring knowledge and practical experiences about managing natural disasters.*" This would indicate that there is increasing national support for the strategies promoted by the project, and that its example should be expanded.

The strengthening of houses was considered by Communes leaders as well as a key component of the Poverty Reduction Programme in rural areas.

ii) ***Evolution of rural habitat***

There has been a significant level of investment in housing over the past decade and much of it is vulnerable; but a characteristic that is now clear is that many of the buildings, built incrementally over several years, are unfinished. A lesson emerging from the project is that it is in part the *unfinished* nature of houses that contributes to the high level of vulnerability of these buildings. More effort needs to be made to encourage and help families *complete and strengthen* their homes.

iii) ***Preventive strengthening is viable***

The project set out to demonstrate that preventive strengthening of houses is viable and affordable. At the end of the present project, and thanks to practical demonstration and local involvement, there is wide expression of conviction in the project target communes that the strategy of preventive strengthening is not only workable and economic, but is also highly appreciated and considered to be in many respects a main way that vulnerability can be reduced on a large scale amongst coastal families in a sustainable manner. Actions to promote preventive strengthening should be consolidated.

iv) ***Practical demonstration needs to be matched by developing the social and institutional process.***

The project was firstly a technical project, to demonstrate that preventive strengthening is cost effective and efficient; and secondly a project dealing with communication methods that encourage the authorities and the population to engage in preventive strengthening. This has been successful.

But a lesson from that project has been that to be sustainable, the overall institutional, social, economic and practical process must be one that can be managed by family groups in the villages in collaboration with the representatives of the People's Committee with active and motivated participation. For example, beneficiary selection where credit or grants are available needs to be managed by the family and community group at village level.

[6] *Draft paper, Ministry of Planning and Investment, Hanoi, January 2002*

Given the important role that mutual aid plays within the village and neighbourhoods, developing family groups within the community to manage the preventive strengthening process, to spread information about how to participate and about what is involved, and to work with the commune Storm Damage Prevention Committees is important to assure the future of the process. As pointed out by the external evaluator in 2001, whilst access to funds (local and external) for strengthening is important, it is actually even more important to develop and maintain activities and techniques that can work within a relatively small local budget.

v) Access to affordable credit for strengthening

It has become clear that poorer families will turn to local moneylenders in order to engage in strengthening their home. Whilst this is a positive sign of commitment, it has also created pressure on some families because of high rates of interest exacted by informal lending.

There are two important conclusions:

- One needs to demonstrate that people will repay short term affordable loans for house strengthening even though this does not have a direct connection to income generation – because the safety of the houses and the reduction of vulnerability do represent a key component in economic security. Future projects need to demonstrate a viable targeted credit system for those in most need, which can in turn encourage other donors and banks to make credit available.
- There is a need for a credit system for house strengthening.

vi) Promoting the role of women and children in the project

Because many issues and ideas were tested in the 1999 and 2000 whilst establishing the project, gender was not made an explicit issue at the outset. But once the project hard started working, increased attention has been paid to gender issues in the remainder of the project life. Many house owners are women, and face particular difficulties in reducing vulnerability.
Future work needs to develop the position of women as lead participants in making choices and as an active forces in the community to spread the message and develop greater community involvement.
The project has been active in working with children in the communes and this is an aspect that has been particularly successful and should be continued.

vii) Technical flexibility and social/cultural adaptation

Technical flexibility in finding strengthening solutions is needed if the solutions are adapted to the budgets and social expectations of families in different income groups and localities. The classic rural house in the area is composed of three bays, the central one reserved for the ancestors altar; the open frame pitched high quality wooden roof is symbolic of the state of the family and its beauty is fundamentally important.

Thus, the use of diagonal bracing was considered ugly by beneficiaries; brackets that were painted black were less appreciated then those painted red which made them less visible. In broader terms, not two houses are the same and one cannot talk of a model house; and there are distinct styles and traditions within specific communes. These preferences and traditions need to be respected.

viii) Development of skills through training

Training was provided to builders, but needs in reality to be extended more consciously to cover both construction workers and family groups members in the community, so that knowledge (what to do) and skills (how to do it) are available at village level and so that families themselves can choose who they would like to get help from and at what cost.

ix) ***Demonstration and communication***

Demonstration work on private houses and small public infrastructure (schools, health posts and markets) play an important role, but need to be spread through the community so that as many people as possible can see the results in different localities. There need to be clear criteria and advice explaining what a family can and should do. Communication and animation activities equally need to be repeated frequently, using simple methods that can be sustained, so that people are aware of the need to take action.

x) ***Popular Conscience***

The general opinion of local leaders is that the project has generated a profound change in people's awareness about preventing storm and typhoon damage, and not solely amongst people who have been direct beneficiaries, but on a wider scale in the commune. This raise awareness of the need (and of the possibility) to take prevention action is nevertheless a long process, and one that brings this need into competition with other family priorities.

The project needs to maintain a level of awareness raising of the need and the process, and it needs to facilitate the process of strengthening in a manner that does not conflict with other needs.

b) Changes to operations

What changes in operations would you like to see based on these lessons?

The project has been able to demonstrate a variety of ideas, and show that they work in the Central Viet Nam environment. There needs, nevertheless, to be a strategy that enables these lessons to be taken forward and applied on a greater scale in order to have lasting impact.

8. FINANCIAL REPORTING

8.1. Statement of Income and Expenditures

Budget as of CIDA Contract March 1999

Budget Item No.	Item	Budget As per Contract
1.	**Equipment**	**26 350**
2.	**Local teams**	**85 119**
2.1	Danang Coordination team	51 071
2.2	Mobile team Quang Nam	20 807
2.3	Mobile team, Danang	13 241
3.	**Activities**	**49 749**
3.1	Operation costs	28 373
3.2	Development of animation projects	7 203
3.3	Training for local counterparts/teams	6 229
3.4	Demonstration actions/strengthening	7 945
4.	**Design, training and Technical assistance**	**132 317**
Total		293 535
Management		29 354
Total		**322 889**

Budget Modified May 1999 and Autumn 2000 to increase expenditure in communes

Budget Item No.	Item	Budget adjusted April 1999	Budget adjusted Autumn 2000	Expenses	% Expenditure
1.	**Equipment**	**13 300**	**13 300**	**10 081**	**75,80%**
2.	**Local teams**	**73 466**	**68 916**	**72 177**	**104,73%**
2.1	Hue coordination team	31 067	45 906	46 496	
2.2	Mobile team Hue	14 083			
2.3	Mobile team Quang Tri	756			
2.4	Operating costs	27 560	23 010	25 681	
3.	**Activities**	**104 400**	**108 950**	**107 876**	**99,01%**
3.1	Animation	7 150	11 700	10 660	
3.2	Training	8 150	8 150	8 089	
3.3	Demonstration actions / Hué	85 200	89 100	89 127	
3.4	Demonstration actions / Quang Tri	3 900			
4.	**Technical assistance**	**102 480**	**102 480**	**103 603**	**101,10%**
Total		293 646	293 646	293 737	**100,03%**
Management		29 365	29 365	29 374	**100,03%**
Total		**323 011**	**323 011**	**323 111**	**100,03%**

Disbursement of CIDA funding has been 100%

8.2. Explanation of variance

The budget has been used in its entirety.
Compared with the original budget of March 1999, there is considerable variance *in favour* of activities in the communes, from all other budget lines.

An increased in the demonstration of preventive strengthening.
The amount attributed to demonstration activities were adjusted in April 1999 initially in response to (a) a shift in strategy based on the appreciation that the poor would need more substantial financial help in order to undertake the preventive strengthening of their homes, and that (b) that an increase in funding going directly to families in the communes would contribute to creating a favourable working environment for the project with local authorities. This change was made possible principally by adjusting the local and international staffing costs, and be reducing transport purchases (no 4 wheeled vehicle, no boat) which have in practice been rented when required.

Consolidation of local teams.
The period for institutional setup of the project was longer than expected, and further delayed by major floods in the last quarter of 1999. This and a rationalisation of the teams into one single team based in Hué meant that local staffing levels were reduced and covered 2 years, without any negative impact on the project.

Technical assistance
The technical assistance and programme coordination was reduced in overall input time and operated on a part time presence in Viet Nam, which helped to develop the responsibility of the local staff in the project on a day to day basis. This change was in part made possible at the start of the project because DW was successful in recruiting staff for this project who had already worked on previous DW projects in Viet Nam.

Adjustments in autumn 2000
Small budget adjustments were again made in autumn 2000 in the light of an evaluation of costs and projected expenditure. Activities in Quang Tri were not pursued on the basis that this would have diluted the impact of the project unnecessarily.

8.3. Adequacy of original budget estimate.

The original budget underestimated costs for the demonstration of house strengthening.
The reality of working in Central Viet Nam is that transport in the communes is essentially by small motor-bike; a car or pick up would not have been able to access many localities.

8.4. Local fund raising.

Households have contributed 40 000 US$.
The People's Committee in ten communes in Thua Thien Hué have contributed 10 000 US$.

9. ANNEXES

Annexe 1. Evaluation by the People's Committee of Thua Thien Hué Province
Annexe 2. Evaluation by the Committee for Flood and Storm Damage Prevention
Annexe 3. Available Documentation
Annexe 4. Activity summary sheets
Annexe 5. Ten Key points of Storm resistant construction
Annexe 6. Summary of demonstration work and costs
Annexe 7. Examples of preventive strengthening work in communes

Annexe 1 : Evaluation by the People's Committee, TT Hué

Comité populaire de la Province TTHué

République socialiste du Vietnam
Indépendance – Liberté – Bonheur

N°: 1006/CV-UB

Hué, le 24 mai 2001

Objet: *Evaluation sur les résultats de la mise en œuvre du Projet "Prévention des Dommages causés à l'Habitat par les Cyclones" dans la Province TTHué & Propositions vis à vis des bailleurs de fonds pour la phase d'extension future*

A l'attention de: ***Direction du Projet "Prévention des dommages causés à l'habitat par les cyclones, Centre Vietnam", financé par le gouvernement canadien par la mise en oeuvre de l'Organisation DWF***

DEVELOPMENT WORKSHOP VIETNAM
91/44 A PHAN DINH PHUNG, VILLE DE HUE, VIETNAM

Le Projet "Prévention des Dommages causés à l'Habitat par les Cyclones" dans le Centre, financé par l'Agence Canadienne de Développement Internationnal et appuyé par Alternatives (Canada) par la mise en œuvre de l'Organisation DWF en collaboration avec ses partenaires des Provinces du Centre Vietnam pour faire de l'exécution du Projet. Ce dernier a été approuvé par le Comité Populaire de la Province Thua Thien Hué et décidé no: 2799/QD-UB en date du 14/12/1999. Après avoir étudié le premier bilan des activités conduites du Projet en l'an 2000 et 1er trimestre /2001 et celui du Comité Provincial de Prévention Inondations-Cyclones Thua Thien Hué, le Comité Populaire présente ses remarques suivantes:

I. Evaluation sur les résultats acquis

Le Projet a bien respecté des compromis accordés entre le Comité populaire de la Province et l'Organisation DWF dans son processus de réalisation des activités à travers la stratégie, l'organisation, et la direction qui sont assez bonnes, il nous semble -t -il. De façon concrète:

1. Le Projet actuel a fait de la démonstration pratique de solutions adaptées, du développement de la conscience communautaire, populaire, et des ouvriers de construction locaux dépendants de régions d'action du Projet à propos des connaissances et de la technique anti-cyclonique appliquées avec efficacité au renforcement de l'habitat et des bâtiments publics. Il s'agit d'un projet de combinaison des "actions non-travaux et travaux" dans la précaution pour la diminution des dégâts causés à l'habitat par les cyclones.

2. *A travers la sensibilisation, la mobilisation en combinaison avec la démonstration technique appliquée au renforcement entier ou partiel de l'habitation, des bâtiments d'intérêt public dans les communes pilotes, dans celles d'extension, le Projet actuel a diffusé d'une manière directe et indirecte des connaissances préventives, ainsi que de la technique de construction anti-cyclonique en faveur des communautés, cadres communaux dans les régions les plus touchées par les cyclones. Ce qui tombe dans une des "4 solutions Anti Inondation-Cyclone sur place en la matière" de la Province et des localités.*

3. Grâce à la collaboration harmonieuse entre la Coordination de Projet DWF à Hué et les autorités de tous niveaux, au fur et à mesure la participation active des experts étrangers, techniciens vietnamiens du Projet, l'enthousiasme populaire des communes s'exprime nettement vis à vis du Projet. Et plus, la mobilisation intérieure a été faite de la part du Projet à la contribution de l'argent, de la main d'œuvre pour les familes bénéficiaires particulièrement afin de faire construire de l'habitat et des bâtiments d'intérêt public dans les communes auxquelles le Projet se déroule.

Propositions

Les objectifs du Projet doivent être précisés comme suivant:

Les activités d'animation mises en œuvre à diverses formes seront données largement et profondément jusqu'aux communautés et sur le plan provincial, au service de la précaution de diminution des dommages causés aussi à l'habitat qu'à l'homme par les cyclones.

Le conseil sur la technique et le soutien du budget au renforcement de l'habitat continueront d'être donnés à la reconstruction des travaux au profit des localités bénéficiaires et non-bénéficiaires pour la phase d'extension future.

Le développement de la conscience communautaire concernant la prévention Inondations-Cyclones pour diminuer des dommages éventuels provoqués par les calamités naturelles devra être offert aux autorités, aux organisations et collectivités, et en particulier aux villages, communes...Donc, ces objectifs seront mis l'accent sur les points suivants:

1. Le Projet devrait élargir de plus en plus ses activités à d'autres communautés, alors que la Province TTHué est constituée de 151 quartiers, communes dont plus de 62 sont de régions touchées souvent par les inondations et cyclones, en difficultés économiques elles-mêmes. Donc, le choix des communes bénéficiaires par le Projet devrait avoir des accords avec les autorités à tous niveaux pour être unanimes du niveau communal au provincial pour organiser l'étude et l'évaluation. En même temps, la Direction du Projet rapporterait fréquemment son avancement de réalisation des activités ainsi que ses difficultés rencontrées auprès de la Province, du Service du Plan et de l'Investissement, du Comité de Direction pour la Prévention Inondation-Cyclone Provincial...

2. Le Comité de Direction du Projet pourrait améliorer ses méthodes de communication, sensibilisation populaire afin de développer de mieux en mieux la conscience des communautés à propos des effets et mesures préventives des cyclones. Plus loin, les scénarios théâtrales sur la précaution des calamités naturelles seraient bien mis en service aux besoins, us et coutumes des habitants en utilisant les instruments musicaux traditionnels comme: chants humoristiques, chants huéens, chansons populaires des travailleurs, pièces courtes de théâtre... De plus, un concours sur connaissance anti-cyclonique serait organisé à travers les moyens mass média dans la population, et particulièrement dans les communes ; puis une loterie de construction anti-cyclonique pourrait être faite à titre d'animation juste aux établissements secondaires et universitaires à Hué.

3. Etant donné que le taux de pauvreté reste fort ainsi que la capacité financière de la population limitée, le Projet pourrait chercher un capital d'investissement non-remboursable à la réalisation d'un programme de crédit à taux d'intérêt préférentiel, ou par défaut d'intérêt; mobilise au fur et à mesure la population et les organisations, collectivités à contribuer de la journée de travail et de l'argent de poche pour pouvoir aider les familles vraiment difficiles en conditions économiques à favoriser le renforcement de leur habitat pour la diminution des dégâts.

4. Entretenir à long terme les réussites acquises du Projet, et notamment des connaissances anti-cycloniques, technique de renforcement de l'habitat. Désormais, les formations répétées Anti Inondation-Cyclone seront offertes aux cadres locaux chargés de la prévention Inondation-Cyclone aux échelons districtal et communal, et aux unités Croix Rouge, ceux qui sont considérées "une base primordiale" pour entretenir les efficacités du Projet plus tard.

5. Conserver le mieux possible les dossiers des maisons renforcées (de l'étude, conception, construction...), et les maisons-modèle reconstruites, financées par le Projet qui seront mises en

garde également et réévaluées sur la résistance de construction et les efficacités du Projet selon le plan de vérification défini après la saison de pluies-cyclones de l'année 2001.

6. Classifier les types de maisons renforcées pour fournir des conseils nécessaires aux communautés sur "la santé pratique de leur habitat" en les encourageant eux-mêmes de faire des précautions contre les risques des événements importants (cyclone, inondation forts).

7. La réalité climatique à Thua Thien Hué des dernières années montre que les cyclones, dépressions tropicales avaient été allés avec grosses pluies et inondations fortes. C'est pour cela, il faut faire attention à la technique et aux méthodes d'animation pour la phase d'extension: les travaux de renforcement, de construction des bâtiments dans les régions touchées par les cyclones seront envisagés de pair avec les mesures de refuge contre les inondations pour valoriser les efficacités du Projet, et enfin diminuer des dommages humains et matériels en faveur des communautés et d'autres unités économiques.

8. La Compagnie de Conception et Conseil de Construction Thua Thien Hué est l'unité de coordination parallèle avec DWF. En se basant sur les travaux pratiques, le Projet devra alors réguler ses critères de conception de l'habitat, des bâtiments civils qui peuvent être adaptés aux conditions climatiques, spécifiques. Et en même temps, des documents, conseils seront fournis aux cadres locaux de construction, aux unités de gestion pour la construction de base dans les localités, ainsi qu'aux toutes couches populaires à propos de la technique de renforcement de l'habitat, des bâtiments publics pour lutter contre les cyclones-inondations.

Le Comité populaire de la Province a noté les acquis au bout de 16 mois d'activité passés du Projet (depuis Janvier /2000) et propose aux bailleurs de fonds, financeurs de favoriser plus de bonnes conditions à la continuation et à l'extension de grande envergure du Projet actuel, cela va améliorer mieux la vie des habitants (notamment pour les communautés pauvres) ayant de l'habitat vulnérable qui puissent lutter contre les effets des cyclones-inondations.

En bien souhaitant l'attention des financeurs, bailleurs de fonds à travers nos idées submentionnées, les bonnes réussites du Projet seront devenues bientôt réalité au profit de la population Thua Thien Hué pour la diminution des dommages éventuels à la fois humains et matériels causés par les cyclones à la saison de pluies-cyclones.

Salutations distinguées.

Destinataire

*Comme ci-dessus
*Conseil populaire de la Province
*Président et Vice-Présidents de la Province
*Comité Provincial de Direction pour la Prévention Inondation-Cyclone
* Pour être enregistré

Pour le Comité Populaire de la Province TTHué
Président

Nguyen Van Me

Annexe 2 : Evaluation by the Committee for the Prevention of floods and storms, TT Hué

Comité populaire de la Province TTHué
Direction pour la Prévention Inondation-Cyclone

République socialiste du Vietnam
Indépendance – Liberté – Bonheur

N°: 20/TT-PCLB

Hué, le 4 mai 2001

COMITÉ DE DIRECTION POUR LA PRÉVENTION DES INONDATIONS – CYCLONES, PROVINCE TT HUÉ
2B TRAN CAO VAN
Tel: 054-822519
Fax: 054-824480

A l'attention de: ***Direction du Projet "Prévention des dommages causés à l'habitat par les cyclones, Centre Vietnam", financé par le gouvernement canadien par la mise en oeuvre de l'Organisation DWF.***

DEVELOPMENT WORKSHOP VIETNAM
91/44 A PHAN DINH PHUNG, VILLE DE HUE

A travers des Séminaires, visites sur terrain des sites de la province TTHue, organisés par le Projet, ainsi que ses études sur le premier bilan des activités menées du Projet en l'an 2000 et de la Phase I/2001, le Comité de Direction pour la Prévention Inondation-Cyclone Provincial donne ses évaluations et propositions suivantes:

I. Evaluation sur les résultats acquis

La stratégie, l'organisation, et la direction sont bonnes et bien adaptées aux compromis accordés entre le Comité populaire de la Province et l'Organisation DWF.

Le Projet actuel contribue à développer la conscience d'une partie populaire des communes bénéficiaires, concernant les effets du cyclone et les mesures de renforcement anti-cyclonique de l'habitat appliquées aux régions touchées fréquemment par les calamités naturelles.

Il s'agit d'un projet de combinaison des "actions non-travaux et travaux" dans la précaution pour la diminution des dégâts causés à l'habitat par les cyclones.

L'idée primordiale du Projet s'exprime encore comme suivante: l'unités (villages, communes) sont prises comme réseaux de communication et sensibilisation jusqu'aux cadres, et aux habitants, ce qui tombe dans une des "4 solutions Anti Inondation-Cyclone sur place" qu'ont réalisées actuellement la Province et les localités.

II. Propositions

a) Le Projet devrait élargir de plus en plus ses activités à d'autres communautés non-bénéficiaires, alors que la Province TTHué est constituée de 151 quartiers, communes dont plus de 62 sont de régions touchées souvent par les inondations et cyclones, en difficultés économiques elles-mêmes. Donc, le choix des communes bénéficiaires par le Projet devrait avoir des accords avec les autorités à tous niveaux pour être unanimes du niveau communal au districtal pour organiser l'étude et l'évaluation. En même temps, la Direction du Projet rapporterait fréquemment l'avancement de réalisation des activités ainsi que les difficultés rencontrées auprès de la Province, du Service du Plan et de l'Investissement, du Comité de Direction pour la Prévention Inondation-Cyclone Provincial...

b) Le Comité de Direction du Projet pourrait améliorer ses méthodes de communication, sensibilisation populaire afin de développer de mieux en mieux la conscience des communautés à propos des effets et mesures de précaution cycloniques. Plus loin, les scénarios théâtrales sur la précaution des calamités naturelles seraient bien mis en service aux besoins, us et coutumes des habitants en utilisant les instruments musicaux traditionnels comme: chants humoristiques, chants huéens, chansons populaires des travailleurs, pièces courtes de théâtre... De plus, un concours sur connaissance anti-cyclonique serait organisé à travers les moyens mass média dans la population, et particulièrement dans les communes ; puis une loterie de construction anti-cyclonique pourrait être faite à titre d'animation juste aux établissements secondaires et universitaires à Hué.

c) Etant donné que le taux de pauvreté reste fort ainsi que la capacité financière de la population limitée, le Projet pourrait chercher un capital d'investissement à la réalisation d'un programme de crédit à taux d'intérêt préférentiel, ou par défaut d'intérêt; mobilise au fur et à mesure la population et les organisations, collectivités à contribuer de la journée de travail et de l'argent pour pouvoir aider les familles vraiment difficiles en conditions économiques à favoriser le renforcement de leur habitat pour la diminution des dégâts.

d) Entretenir à long terme les réussites acquises du Projet, et notamment des connaissances anti-cycloniques, technique de renforcement de l'habitat. Désormais, les formations répétées Anti Inondation-Cyclone seront offertes aux cadres locaux chargés de la prévention Inondation-Cyclone aux échelons districtal et communal, et aux unités Croix Rouge, ceux qui sont considérées "une base primordiale" pour entretenir les efficacités du Projet plus tard.

e) Conserver le mieux possible les dossiers des maisons renforcées (de l'étude, conception, construction...), et les maisons-modèle reconstruites, financées par le Projet qui seront mises en garde également et réévaluées sur la résistance de construction et les efficacités du Projet selon le plan de vérification défini après la saison de pluies-cyclones de l'année 2001.

f) Classifier les types de maisons renforcées pour fournir des conseils nécessaires aux communautés sur "la santé pratique de leur habitat" en les encourageant eux-mêmes, de faire des précautions contre les risques des événements importants (cyclone, inondation si forts).

Ci-dessus les propositions du Comité de Prévention Inondation-Cyclone de la province TTHué concernent les déroulements du Projet par les actions directes de l'Organisation DWF dans la province TTHué.
En souhaitant l'attention des organisations financeurs à travers nos idées mentionnées, et enfin les bonnes réussites prochaines du Projet contribueront bientôt au soutien populaire de la Province TTHué pour diminuer à un certain degré, des dégâts humains, matériels, et de l'habitat à la saison de pluies-cyclone.
Salutations distinguées.

Destinataire
*Comme ci-dessus
* M. Le Van Hoang, Chef CPIC pour rapport
* Pour être enregistré

Pour le Comité de Prévention Inondation-Cyclone
Expert en chef

Phan Thanh Hung

Annexe 3 : Available Documentation

Language ..... English.....French ..... Vietnamese

I/ Reports

- Identification mission, December 1998 ..... *
- Project Document, January 1999 ..... *
- Interim report 1, June 1999 ..... *
- Interim report 2, January 2000 ..... *
- Interim report 3, September 2000 ..... *
- Interim report 4, January 2001 ..... *
- Interim report 5, July 2001 ..... *
- **Final Report, March 2002** ..... *

- Project presentation, March 2000 ..... * ..... *
- Project presentation, October 2000 ..... * ..... *

- Project presentation flyer, January 2000 ..... * ..... * ..... *
- Project presentation flyer, June 2001 ..... * ..... * ..... *

- Activités 2000 – 2001, Récapitulatif, décembre 2001 ..... *
- Activities in Thuy Thanh Commune, November 2001 ..... *
- Activities in Phu Da Commune, November 2001 ..... *
- Activities in Huong So Commune, November 2001 ..... *

II/ Evaluation

- External evaluation, May 2001 ..... * .... *
- Etudes de cas sur les bénéficiaires du projet ..... * ..... *

III/ Context

- Presentation of the 3 pilots communes, March 2000 ..... * ..... *
- Presentation of the 7 extension communes, November 2000 ..... * ..... *

IV/ Technical documents

- Dossier de base sur les cyclones, mars 2000 .... *
- Études sur l'habitat .... *
- Manuel de construction, version finale, décembre 2001 .... *

V/ Housing and public facilities reinforcement

- Habitat et renforcement anticyclonique, Étude préliminaire, janvier 2000 ..... * ..... *
- Habitat et renforcement anticyclonique, Étude 3 communes, mars 2000 ..... * ..... *
- Habitat et renforcement anticyclonique, Travaux pilotes, avril 2000 ..... * ..... *
- Bilan des travaux pilotes d'amélioration de l'habitat, juillet 2000 ..... * ..... *
- Habitat et renforcement anticyclonique, Récapitulatif, décembre 2000 ..... * ..... *
- Habitat et renforcement anticyclonique, Travaux réalisés, juillet 2001 ..... * ..... *
- Habitat et renforcement anticyclonique, Travaux réalisés, Synthèse, janvier 2002 .* ..... *

Housing

- Fiches habitat (222) ..... *
- Fiches habitat (15) ..... *

Public facilities presentation

- Canal de Phu Da ..... * ..... *
- Marchés de Vinh Hai, Quang Tho, Huong So ..... * ..... *
- Écoles maternelles de Thuy Xuan, Thuy Thanh, Phong Binh ..... * ..... *
- École primaire de Phu Da ..... * ..... *
- Écoles maternelles de Huong Chu, Vinh Xuan, Vinh Giang ..... * ..... *

VI/ Animation tools

- Exhibition panels (Workshops) ..... *
- Poster with 10 key principles ..... *
- Leaflet: How can you protect your house ..... *
- Fan, caps, raincoat ..... *

VII/ Audio-video

Video

- Video film on project activities, November 2000 ..... *
- Video film on project activities, June 2001 ..... *
- Film from Hué television, June 2001 ..... *

Slide show

- Vaccinate your house against cyclones damages, June 2001 ..... * ..... *

Audio K7

- Messages and songs, June 2001 ..... *

Songs, poems, theatre plays

- A family story, May 2000 ..... * ..... *
- A typhoon destroyed again my house, November 2000 ..... *
- Chanson : Prévention des cyclones, juin 2001 ..... * ..... *
- Poéme : La commune déterminée à lutter contre les cyclones, juin 2001 ..... * ..... *

Annexe 4 : Activity summary sheets

Activity 1: Raising awareness about damage prevention

Action

- The project has continued and expanded its programme of animation in the communes and at provincial level.
- The project now works in 10 communes in Thua Thien Hué Province, with over 100 000 inhabitants.

Result

- Public and official awareness is considerably enhanced. Families claim to be well aware of the project message; they are keen to participate if possible, and the commune leaders are providing committed support. This 'soft' activity in the project is highly considered by commune leaders.

Achievements

Raising awareness in the communes and the province is making use of a large range of animation activities designed to attract public attention. These include:

- Theatre and shows have been organised in each commune at the request of the commune's 'Storm Damage Prevention Committee' (SDPC). Shows are on the theme of damage prevention with songs, poetry and theatre, all written and performed by people from the communes.
    - Shows mobilise teachers, singers and actors, and attract large audiences.
    - Women are substantial contributors to these animation activities.
- An intense 2-week "prevention campaign" in June 2001 with touring 'Storm prevention' Renault Bus increased awareness further, with competitions for builders, children and members of the public, culminating in prize giving and show attended by province leaders.
    - A gaily-painted bus with information boards and loudspeaker toured all the communes, stopping in market and public places, and distributing leaflets to adults and children.
- In June 2001, 1000 families (in 10 communes) received house-to-house specific advice on how to strengthen their homes.
    - The project is successfully meeting the important challenge of providing advice direct to families; the SDPC is also actively engaged in this process and helps.
- Distribution of publicity: pamphlets, hats, fans, waterproofs and calendars
    - Families and individuals reminded constantly about the message: "protect your house".
- Posters on "10 key points of Storm Resistant Construction" distributed widely in communes; street banners with prevention message displayed in all project communes.
    - In the communes, it is hard to miss the project message shown on every road.
- Each commune's loudspeaker system is used regularly to play a cassette prepared by the project, with songs and information on damage prevention.
    - The commune SDPC repeats these broadcasts frequently, and request for cassettes came from the communes.
- Provincial TV produced and showed a prime-time programme on the project and the prevention campaign
    - The Local TV has been filming the project since March 2000, and is now sharing its videos with National TV as well.
- Strengthening existing houses, schools and markets (see below) is perceived locally as a very important 'awareness raising' activity
    - Everybody in the community knows whose house has been strengthened and what was done.

Activity 2: Engaging official commitment for action

Action

- The project has established commune 'Storm Damage Prevention Committees' (SDPC) who are now active in supporting the project activities in each commune in collaboration with the project.
- The project keeps liasing closely with local authority counterparts and this has nurtured a strong sense of local "project" ownership.

Result

- There is official and genuine support for the project and its activities. This manifests itself through the substantial commitment of personal time and commune resources that is taking place.

Achievements

- In each commune, a 'Storm Damage Prevention Committee' has been established and has taken on a leading role in managing project activities in each commune.
    - The SDPC from all communes meet once a month in a different commune to share information on experience, progress and plans, and to discuss particular issues – for example the June 2001 SDPC meeting discussed in detail the issue of targeted credit for house strengthening.
    - SDPC devote considerable *voluntary* time to project activities.
- The communes are committing their own funds to project activities of economic and educational importance
    - Communes contribute to the costs of strengthening local infrastructure.
- Teachers in the communes are extremely active, organising project related events with the children, and contributing to public animation events in various ways
    - Schools have been a focus of project activities involving teachers and children
    - The subject of storm damage prevention is now being raised in classrooms
    - Hundreds of children have participated in drawing competitions.
- The Provincial president and vice president are forthright in their support for the project's activities and vision
    - The project is getting vocal support from the highest provincial levels
- The National Committee for Storm Prevention now participates in Project meetings
    - The project is attracting wider national attention, and is now actively publicising its approach in Hanoi.
- The District leaders have increased their presence in periodic project reviews
    - Participation in seminars is growing as the project enhances its profile throughout the province. The recent 'prevention campaign' has contributed to this heightened level of interest.

Activity 3: Developing skills and awareness through training and debate

Action

- The project has organised training sessions for builders and village chiefs in each commune.
- Seminars are held to bring together commune and provincial leaders.

Result

Workshops have given village builders and leaders significantly enhanced practical knowledge about house strengthening techniques

The provincial level seminars have provided the forum for developing knowledge about actions for damage prevention.

Achievements

- In each commune, workshops have brought together commune construction team leaders and village representatives:
    - Working sessions combine theory, visits and practice, using models and work on houses or schools
    - Local building practice and storm resistant solutions are discussed
    - Participants strengthen buildings in the commune during the workshop
    - The workshops are the first ever opportunity many people have had to consider these issues.
- About 450 people have participated in the short training sessions on construction techniques, who in turn represent larger groups of builders who can benefit indirectly from the workshops.
- Training has been provided to villagers who participate in community facilities strengthening
    - The markets and the port at Phu Da brought large numbers of people together who benefited from short training sessions and shows.
- A manual is distributed that provides an overview of storm resistant techniques, and a simplified version is planned.
- Local decision makers participating in the provincial seminars have developed awareness on storm damage prevention issues.
    - Participants are tested on their knowledge;
    - Commune visits, and posters and handouts provide first hand information on what steps can be taken to reduce vulnerability.
- Teachers have received information about storm damage prevention so that they can share this with their pupils; drawing competitions about typhoons have been organised by teaching staff.

Activity 4: Demonstrating preventive strengthening

Action

- Strengthening existing houses and public buildings is an ongoing and important practical activity that has shown people what can be done and what it costs.

Result

- Families and the communes are keen to participate in the project activities.
- Families are making a significant financial commitment to strengthening their building, including borrowing.
- The communes are also contributing funds for strengthening their public facilities.
- Demonstration of strengthening has so far taken place on 222 existing houses and 16 public facilities in the ten communes.

Achievements

- The project has reduced its subsidy to each family to a maximum of 250 USD for strengthening.
- Families are putting their money into the project: through savings and through borrowing, to date nearly 40 000 USD comes from families
- Many families are sufficiently committed to the strengthening message that they are borrowing both from their family, and borrow from moneylenders at high rates.
    - Readiness to borrow, although placing a strain on the family, is a significant indication of support for the project's message. Nevertheless, some families cannot participate since they are too poor and cannot afford to contribute anything to their strengthening their own house.

- Encouraged to strengthen their homes, some families have decided to rebuild their houses completely at the same time.
    - The project has acted as an incentive for more generalised home improvement.

- The project has contributed to the strengthening of 3 markets and a port, which have important local economic interest.
- At least 12 schools will have been strengthened, providing a good example to pre-primary and primary school children.
    - Most schools worked on by the project are similar in size to houses and use the same techniques.

Annexe 5 : Ten Key points of Storm resistant construction

The 10 key points

1. Choose the location carefully to avoid the full force of the wind.
2. Build a house with a simple shape to avoid negative pressure.
3. Build the roof at an angle of 30° to 45° to prevent it from lifting off.
4. Avoid wide roof overhangs; separate the veranda structure from the house.
5. Make sure the foundations, walls, roof structure and roof covering are all firmly fixed together.
6. Reinforce the triangular bracing in the structure.
7. Make sure the roof covering is attached to the roof structure to prevent it from lifting.
8. Match opposing openings.
9. Use doors and windows that can be closed.
10. Plant trees around the house as wind breaks.

Annexe 6 : Summary of demonstration work and costs

2000

Commune	House	Project	Families	Total
Vinh Hai	12	78 226 000	59 002 000	**137 228 000**
Huong So	9	44 755 000	51 150 000	**95 905 000**
Phu Da	14	87 957 000	83 339 000	**171 296 000**
Total	**35**	**210 938 000**	**193 491 000**	**404 429 000**
		6 026 800	**5 528 314**	**11 555 114**

Public facility	Project	Commune	Total
Market	98 548 000	18 250 000	**116 798 000**
Safe harbour	76 654 000	65 000 000	**141 654 000**
2	**175 202 000**	**83 250 000**	**258 452 000**

2001-2002

Commune	House	Project	Families	Total
Vinh Hai	28	110 493 000	128 682 000	**239 175 000**
Huong So	21	80 285 000	24 150 000	**104 435 000**
Phu Da	37	138 188 000	36 110 000	**174 298 000**
Vinh Giang	13	53 162 000	93 810 000	**146 972 000**
Thuy Xuan	15	54 324 000	21 950 000	**76 274 000**
Vinh Xuan	14	47 458 000	15 206 000	**62 664 000**
Thuy Thanh	15	54 871 000	20 360 000	**75 231 000**
Huong Chu	15	52 478 000	23 850 000	**76 328 000**
Phong Binh	14	49 201 000	16 062 000	**65 263 000**
Quang Tho	15	46 755 000	20 375 000	**67 130 000**
Total	**187**	**687 215 000**	**400 555 000**	**1 087 770 000**
		3 674 947	**2 142 005**	**5 816 952**

Public facility	Project	Commune	Total
Market	33 000 000	18 000 000	**51 000 000**
Primary school	22 476 000	5 000 000	**27 476 000**
Kindergarden	32 435 000	10 368 000	**42 803 000**
Kindergarden	15 000 000	5 000 000	**20 000 000**
Kindergarden	26 090 000	8 100 000	**34 190 000**
Kindergarden (2)	48 149 000	8 400 000	**56 549 000**
Kindergarden (5)	18 038 000		**18 038 000**
Kindergarden	16 000 000	7 000 000	**23 000 000**
Market	22 000 000	6 000 000	**28 000 000**
14	**233 188 000**	**67 868 000**	**301 056 000**

Total

Commune	House	Project	Families	Total
Vinh Hai	40	188 719 000	187 684 000	**376 403 000**
Huong So	30	125 040 000	75 300 000	**200 340 000**
Phu Da	51	226 145 000	119 449 000	**345 594 000**
Vinh Giang	13	53 162 000	93 810 000	**146 972 000**
Thuy Xuan	15	54 324 000	21 950 000	**76 274 000**
Vinh Xuan	14	47 458 000	15 206 000	**62 664 000**
Thuy Thanh	15	54 871 000	20 360 000	**75 231 000**
Huong Chu	15	52 478 000	23 850 000	**76 328 000**
Phong Binh	14	49 201 000	16 062 000	**65 263 000**
Quang Tho	15	46 755 000	20 375 000	**67 130 000**
Total	**222**	**898 153 000**	**594 046 000**	**1 492 199 000**
		60%	**40%**	**100%**

Public facility	Project	Commune	Total
Market	98 548 000	18 250 000	**116 798 000**
Market	33 000 000	18 000 000	**51 000 000**
Harbour, P. school	99 130 000	70 000 000	**169 130 000**
Kindergarden	32 435 000	10 368 000	**42 803 000**
Kindergarden	15 000 000	5 000 000	**20 000 000**
Kindergarden	26 090 000	8 100 000	**34 190 000**
Kindergarden (2)	48 149 000	8 400 000	**56 549 000**
Kindergarden (5)	18 038 000		**18 038 000**
Kindergarden	16 000 000	7 000 000	**23 000 000**
Market	22 000 000	6 000 000	**28 000 000**
16	**408 390 000**	**151 118 000**	**559 508 000**
	73%	**27%**	**100%**

Commune	%	Project	Families	Communes	Total
Vinh Hai	24,0%	287 267 000	187 684 000	18 250 000	**493 201 000**
Huong So	12,3%	158 040 000	75 300 000	18 000 000	**251 340 000**
Phu Da	25,1%	325 275 000	119 449 000	70 000 000	**514 724 000**
Vinh Giang	9,2%	85 597 000	93 810 000	10 368 000	**189 775 000**
Thuy Xuan	4,7%	69 324 000	21 950 000	5 000 000	**96 274 000**
Vinh Xuan	4,7%	73 548 000	15 206 000	8 100 000	**96 854 000**
Thuy Thanh	6,4%	103 020 000	20 360 000	8 400 000	**131 780 000**
Huong Chu	4,6%	70 516 000	23 850 000	0	**94 366 000**
Phong Binh	4,3%	65 201 000	16 062 000	7 000 000	**88 263 000**
Quang Tho	4,6%	68 755 000	20 375 000	6 000 000	**95 130 000**
Total	**100%**	**1 306 543 000**	**594 046 000**	**151 118 000**	**2 051 707 000**
		64%	**29%**	**7%**	**100%**

Costs in VN Dongs (1 US$ = 14 900 Dongs, average rate of exchange during the project)

Annexe 7 : Examples of preventive strengthening work in communes

Kindergarten / Village Lang Xa Bau / Thuy Thanh Commune

1. Location

District	**Huong Thuy**	Commune	**Thuy Thanh**	Village	**Lang Xa Bau**

2. Project

Name	**Kindergarden / Commune Thuy Thanh**
Note	Existing building : grain storage (not in use)

Preliminary study	2/2001	
Contract Commune / DW	12/4/2001	
Works	15/5/2001 - 30/6/2001	
Supervision	Le Toan Thang (DW)	
Total cost in VN Dôngs	*19 389 000*	
Part Commune / School	1 335 000	7 %
Part Project DW	18 054 000	93 %

3. Existing Building

Date of construction	Before 1975
Brief description	
Foundations	Brick foundations with reinforced concrete ring beam, cement screed (90% damaged)
Structure	Brick posts; veranda posts damaged
Walls	Bricks with plaster, 20 cm, h= 2,63m
Roof structure	Wood in bad condition
Roof covering	Clay tiles
Doors & windows	Wood / severely damaged
Total area / m²	51,12 m²
Total value / Dôngs	7 668 000
Value Dôngs / m²	150 000

4. Evaluation (regarding the 10 key principles of cyclone resistant construction) and strengthening works

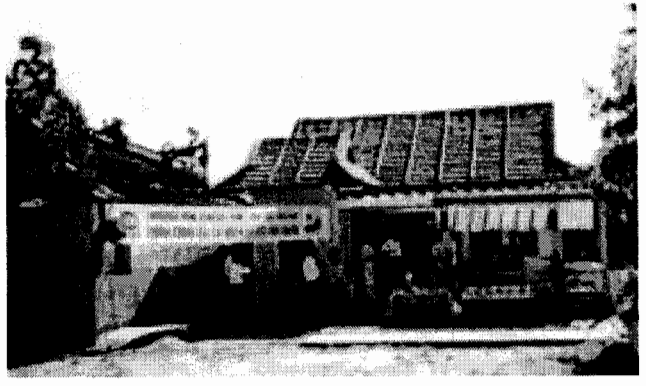
Principle	*Evaluation*	*Reinforcement*
1. Location	• Flat land	• No change
2. Shape of construction	• L shape, vulnerable to wind effects	• Reinforcement of corners
3. Roof angle	• 31°	• No change
4. Roof overhang, veranda	• Veranda nearly destroyed • Overhang 20cm, resistant	• Reconstruction • RC posts for veranda
5. Liaison between : Foundation - Walls - Roof	• Weak liaisons between roof elements (and damaged wood) and walls • Strong liaison between foundation and walls	• Rafters tied to the walls with steel stick (fish tail shape)
6. Triangular bracing	• No bracing	• Reinforcement of gables
7. Roof covering	• Liaisons by nails	• Rafters and purlins tied up with steel sticks
8. Opposing openings	• Incorrect sizes, and few openings	• New windows in the back wall
9. Doors and windows	• Completely damaged	• New doors and windows with locks
10. Trees (as wind breaks)	• Exposed to wind	• Plant more trees around
Global evaluation	**Weak and damaged building**	**Reconstruction**

5. Cost of works

Item	Dongs
Initial value of the building	**7 668 000**
Works / Participation of the Commune	**1 335 000**
Works / Participation of DW	**18 054 000**

Initial value of the building	**7 668 000**
Works	**19 389 000**
Final value of the building	**27 057 000**
Final value / m²	**592 300**

Cost for reinforcement	**14 352 000**
% reinforcement / works	**74%**
% reinforcement / final value	**53%**



House of Mr Nguyen Lac / Phu Da Commune / Reconstruction – Project Phase 1

1. Location

District	**Phu Vang**	Commune	**Phu Da**	Village	**Luong Vien**

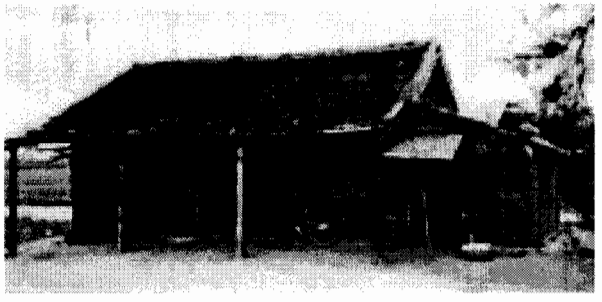
2. Project

Family	**Nguyen Lac**
Note on the family	Monthly average income 150 000 Dongs/person

Preliminary study	15/04/2000	
Contract Family / DW	25/04/2000	
Works	01/05/2000-15/06/2000	
Supervision	Nguyen Si Vien	
Total cost in VN Dôngs	*20 616 000*	
Part Family	7 256 000	35%
Part DW	13 360 000	65%

3. Existing Building

Date of construction	Reconstruction after the 1999 flood
Brief description	Location: risk of storm and flood
Foundations	Bamboo columns fixed in the ground.
Structure	Wood and bamboo frames nearly damaged
Walls	Bamboo mat
Roof structure	Bamboo
Roof covering	Clay tiles
Doors & windows	Bamboo mat and iron sheets
Total area / m²	36 m²
Total value / Dôngs	1 000 000
Value Dôngs / m²	27 000 d/m²



4. Evaluation (regarding the 10 key principles of cyclone resistant construction) and strengthening works

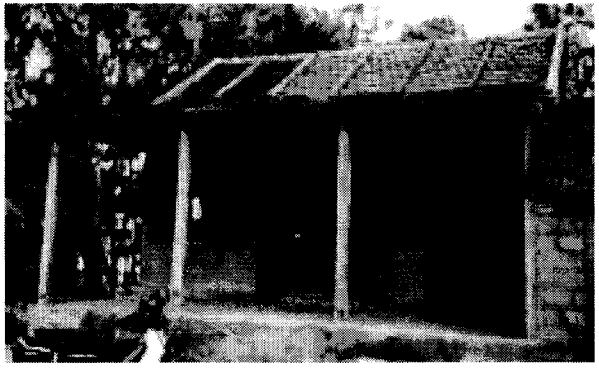
Principle	*Evaluation*	*Reinforcement*
1. Location	• Storm and flood risk	• Moved to the safer location to minimise flood risk and modify wind speed and direction.
2. Shape of construction	• Rectangular	• Reconstruction the news building with good compact form.
3. Roof angle	• 31^0	• 31°
4. Roof overhang, veranda	• Veranda separated with main roof • 20cm. Resistant the storm	• Avoid large roof overhangs, separate veranda covering and frame from the main roof.
5. Liaison between : Foundation - Walls - Roof	• RC columns being fixed in the ground. • Unsafe connection between the wall and roof	• News RC foundation for columns. • Foundation walls: block cement with ring beams • News block cement walls and posts with good connection.
6. Triangular bracing	• No bracing	• Steel bar diagonal braces
7. Roof covering	• Clay tiles	• Rafters and purlins tied up with steel stick. • Reinforced concrete ribs on the roof.
8. Opposing opening	• Incorrect size and opening	• Opening the windows in the back wall
9. Doors and windows	• Not resist strong wind	• News doors and windows with locks
10. Trees (as wind breaks)	• Exposed to wind	• Plant more trees around the house
Global evaluation	**Risk of typhoon and flood damage**	**Reconstruction**

5. Cost of works (in VN Dongs)

Item	Dongs
Initial value of the building	**1 000 000**
Works / Participation of the family	**6 256 000**
Works / Participation of DW	**13 360 000**

Initial value of the building	**1 000 000**
Works	**19 616 000**
Final value of the building	**20 616 000**
Final value / m²	**420 000**

Cost for reinforcement	**3 250 000**
% reinforcement / works	**17%**
% reinforcement / final value	**16%**



House Mr Le Van Lon / Thuy Than Commune / Strengthening – Project Phase 2

1. Location

District	**Huong Thuy**	Commune	**Thuy Thanh**	Village	**Thuy Thanh Chanh**

2. Project

Family	**Le Van Lon**
Note on the family	Old and weak

Preliminary study	11/02/2001
Contract Family / DW	11/02/2001
Works	01/03/2001-30/03/2001
Supervision	Le Toan Thang
Total cost in VN Dôngs	*4 259 200*
Part Family	910 000 21%
Part DW	3 349 200 79%

3. Existing Building

Date of construction	1980
Brief description	Nearly damaged (80%). Vulnerable to normal typhoon.
Foundations	Foundation walls: block cement with ring beam on 5cm concrete slab.
Structure	Bearing wall: block cement with cracks caused by settlements
Walls	Block cement walls without plaster, width=10cm, h=2.6m.
Roof structure	Carpentry: wood in bad condition Purlins and rafters: bamboo nearly damaged
Roof covering	Sheet iron
Doors & windows	Decayed wood
Total area / m²	22,2m²
Total value / Dôngs	6 660 000d
Value Dôngs / m²	300 000 d/m²

4. Evaluation (regarding the 10 key principles of cyclone resistant construction) and strengthening works

Principle	*Evaluation*	*Reinforcement*
1. Location	• Flat land	• No change
2. Shape of construction	• Rectangular	• No change
3. Roof angle	• 30^0	• No change
4. Roof overhang, veranda	• Without veranda • 20cm. Resistant the storm	• Make new veranda with four reinforced concrete (RC) columns and rafters
5. Liaison between : Foundation - Walls - Roof	• No connection between wall and rafters • Unsafe connection between the wall and roof	• News RC foundation for columns, reinforced ring beams for block cement walls. • News block cement walls and posts with good connection.
6. Triangular bracing	• No bracing	• Steel bar diagonal braces
7. Roof covering	• Sheet iron	• Rafters and purlins tied up with steel stick. • Reinforced steel bar on the roof.
8. Opposing opening	• Approximately	• Opening the windows in the back wall
9. Doors and windows	• Nearly destroyed (70%)	• News doors and windows with locks
10. Trees (as wind breaks)	• A little trees around the house	• Plant more trees around the house
Global evaluation	**Risk of typhoon damage**	**Reinforcement**

5. Cost of works

Item	Dongs
Initial value of the building	**6 660 000**
Works / Participation of the family	**910 000**
Works / Participation of DW	**3 349 200**

Initial value of the building	**6 660 000**
Works	**4 259 200**
Final value of the building	**10 919 200**
Final value / m²	**491 855**

Cost for reinforcement	**4 259 200**
% reinforcement / works	**100%**
% reinforcement / final value	**39%**