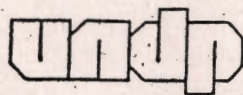




**UNDP / UNCHS / Project VIE/86/020**



**Appropriate Technology Transfer in  
Construction**

**Implementation of a training  
programme for Appropriate  
Technologies**



**Terminal Report**

**January 1993**

**DW/GRET**



# Credits

## VIE/86/020 : Assistance to Human Settlements Planning and Development in Rural Areas

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### Sub-contract : Appropriate Technology Transfer in Construction

<b>Sub-contractor (consortium of NGO's):</b>	<b>Development Workshop</b> - Lauzerte, France <b>GRET</b> - Paris, France
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*1 US \$ = between 10 000 and 11 000 Dongs (1992)*

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# Preface

Part I of this report deals with the 'implementation of a training programme in Appropriate Technologies' as requested in the ToR. It concerns the activities which have taken place within the framework of the sub-contract.

In Part II, a summary review of the sub-contract achievements is presented against expected outputs. The two parts of the document should be considered together, and constitute as a whole the Terminal report for this contract.

***Adapt products and processes to the socio-economic realities of the principle target groups.....***

***.....take ideas beyond the subsidised prototype stage.....***

***.... communicate to the population about what can be done and how they can benefit.***

*Appropriate technology slogans on the walls of buildings in Ninh Van commune*



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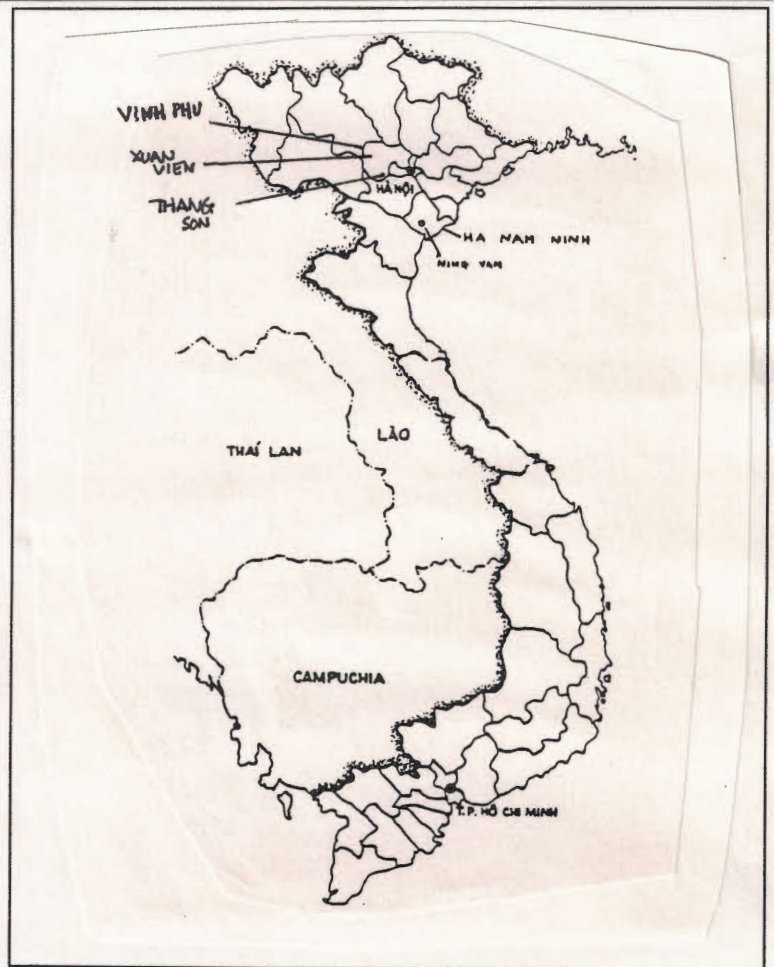
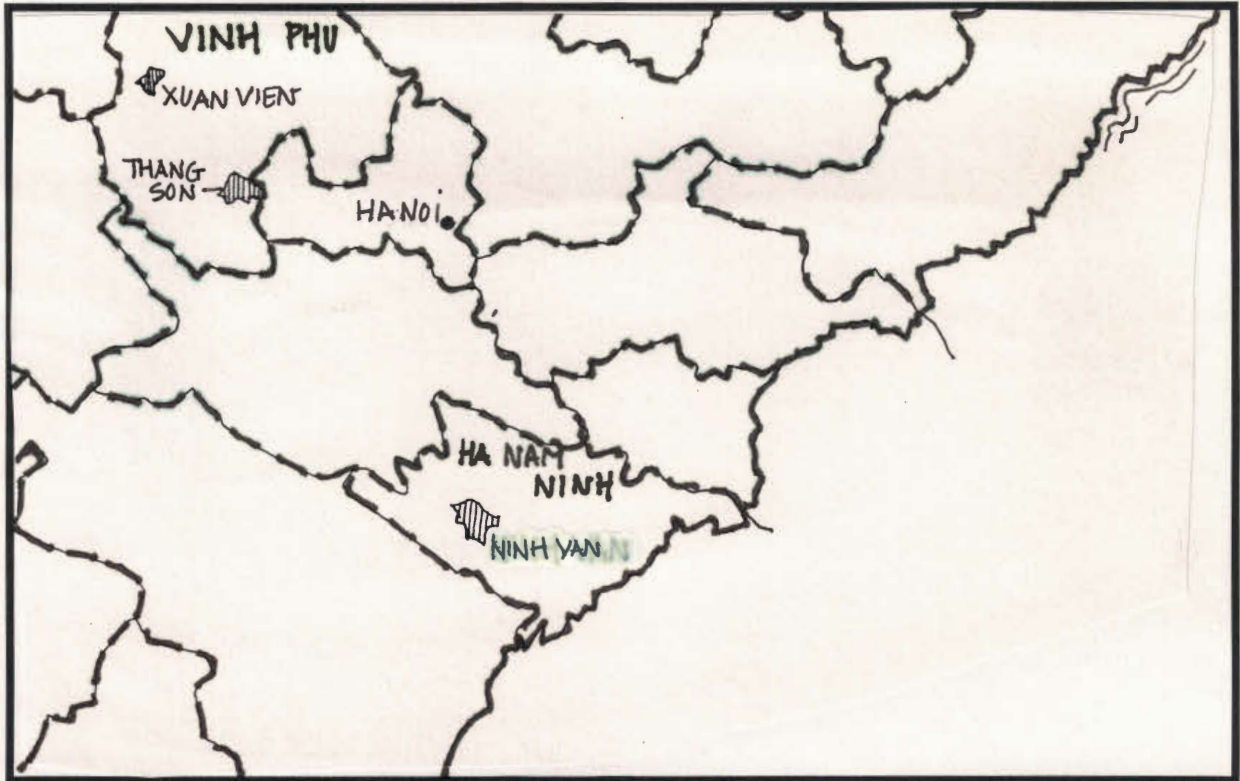
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**Location of "Group B" communes in the provinces round Hanoi**



**Location of project actions in Vietnam**

# Part 1. 1. The context.

## 1.1. The economic and geographical context

The VIE/86/020 programme has taken place in several provinces of the rural areas of the northern part of Vietnam, notably Ha Nam Ninh province (Yen Bac and Ninh Van communes), in Hanoi province (Dai Ang commune) and three communes in Vinh Phu (Hy Cuong, Thang Son and Xuan Vien communes).

The Hanoi and Ha Nam Ninh provinces are typified by being essentially flat, rice growing areas, the former in the red River delta, the latter on the edge of the coastal plain. Of the project's communes, Yen Bac commune\* is coastal and at risk from typhoons. The other communes are far enough from the coast to be largely safe from the menace of typhoons, although Dai Ang and Ninh Van communes can be subject to flooding. The western boundaries of the Ninh Van commune are mountains that rise up behind the flat plains. The countryside is also remarkable for the massive limestone outcrops which rise vertically up out of the paddy fields and which provide the raw materials for stone crushing and carving activities. The area gets on average between 1700 - 2000<sup>mm</sup> rain a year, most of which falls between May and October. The flat land is not far above sea level, and the region is crisscrossed by numerous waterways, some of which are navigable and are used for transporting bulk goods, such as stone and gravel, in the case of Ninh Van commune. The water table is high. Because timber is scarce in the plains, rice straw is a main source of domestic energy, and there is not always enough.

The three Vinh Phu communes involved in the VIE/86/020 project are situated inland to the west of Hanoi. All are hilly, with a mix of terraced paddy fields and, on the steeper slopes, woods. In some cases the stands of trees are still quite unexploited. Rainfall is similar to that of the plains (1700 - 2000mm/year). Compared to the plains, access to the region is poor, with a very underdeveloped road system at commune level. There are many streams, but not all run all year round, and storing water emerges as a problem, as does extracting water from wells which are much deeper than those on the coastal plains. Wood supplies are sufficient for most families to be able to use wood and branches for cooking, but for lighting they depend on oil, which is costly.

The population density of the communes on the plains is higher than that of settlements in the hills. Houses are generally larger in the Vinh Phu province compared with those in either Dai Ang or Ninh Van communes, where there is greater pressure on space. Ethnic differences are also more present in Vinh Phu province, with a greater number of minority groups including Muong people.

\* A group A commune, see explanation in section 2.4., below.

Each commune depends heavily on rice production, although land use and employment on rice production varies. Thus in Thang Son commune rice production takes up only 20% of the total land, as compared to 46% in Ninh Van commune. In Thang Son commune 100% of the population are involved in agriculture, and similarly in Xuan Vien commune, where there only a few people are engaged in forestry and brick making - or are unemployed. Despite this, production is inadequate, and in Xuan Vien commune, for example, 68% of households do not get enough food to last through the year, and need a subsidy, whilst in Ninh Van commune down on the plains, this figure drops to 45%, the very poor, including 15% who receive a rice subsidy for some three months of the year. Ninh Van commune has only about 80% involved in agriculture, whilst some 20 % work in limestone, cement or phosphoric fertilizer production. But an even higher percentage have a part-time involvement in stone production (70% of households) and this represents an important source of supplementary income.

Ninh Van commune has also been in part developed with an industrial base in recent years, with several factories producing cement or fertilizer for the state, and it sits beside the main railway and road link from Hanoi to the south. This state owned industrial base has been in serious decline in recent years. Vinh Phu province, although it has some major industrial centres, is less industrially developed in its rural communes.

*Ninh Van commune - the new public well at Phu Lang, with flooded fields and limestone outcrops in the background.*





*Xuan Vien - the primary school compound with hills behind*

## 1.2. The development context

Whilst there are quite significant differences between the hill communes and those on the plains, they are uniformly poor and have only a limited scope to develop activities other than those which are already underway. Ninh Van commune, because of both its stone resources and its location near a major transport artery, has a potential for developing small scale non-agricultural activities. Whilst these have in the past been largely under the control of the state, this has substantially changed in the past two years, and there are increasing opportunities for private enterprise to develop small productive activities. Some have begun doing so, and, as will be commented on later, these are initiatives which the VIE/86/020 project has been trying to help.

Scope for development outside agriculture and related activities is more limited in the Vinh Phu communes, although there is some production of building materials (bricks) with a low export potential. Forestry could be developed, but the region also suffers from having in the past been a large tea growing area, for which the market has to a great extent declined. One is also aware that some practices which have been in operation for hundreds of years have not changed at all, and are perhaps for the moment still well suited to the process of - for example - harvesting rice crops where labour is plentiful and fields are small and sometimes on many different levels. The development of income generating opportunities and the development of transport links with other districts and other provinces feature as key issues. Actions to improve domestic living conditions must also figure high on the list of assistance requirements, but in most instances, sustained domestic improvement potential is limited until economic improvement can take place.

## 2. The UNCHS VIE/86/020 programme

### 2.1. The UNCHS programme as proposed in the ToR

According to the terms of reference, the development objective of the VIE/86/020 project has been to promote a balanced growth in social and economic conditions throughout Vietnam by assisting in the further development of human settlements in the rural areas of the country so as to enable the rural population to enjoy the same economic, social and material benefit as those who live in the towns.

In order to contribute to the achievement of this development objective, the immediate objectives assigned to the project were to assist in developing:

- "a) an improved capacity within the Institute of Urban and Rural Planning (IURP) within the Ministry of Construction (MOC) for human settlements planning in rural areas, and for the co-ordination of programming and funding for rural infrastructure;
- b) a functioning advisory service on technology matters made directly available to commune communities for the implementation of development plans and projects;
- c) the co-ordination of infrastructure development activities for the up-grading of living conditions in three pilot communes as models for replication of the planning and appropriate technologies advisory service;
- d) an increased knowledge transfer to staff of the MOC on current planning and technological practices related to human settlements development in rural areas."

It was initially foreseen that two Vietnamese institutional partners from the MOC would collaborate in this activity - the first, an offshoot of the IURP, to become known as the Centre for Rural Planning and Development (CERPAD), based in Hanoi, and the second, the Centre for Appropriate Technology Transfer in Construction, (CAT-TIC)\*, situated alongside CERPAD in Hanoi.

\* Originally referred to in the ToR as the TCATC - the Transfer Centre for Appropriate Technologies in Construction.

Within the structure of the project proposed by UNCHS the achievement of objectives a) and c) above would be assisted through consultant inputs in support of the CTA focussing on planning, whilst objectives b) and d) would be largely supported by a sub-contract, for which the objectives were 'to strengthen the capacity of the CATTIC to develop and transfer appropriate technologies in construction to communes of the northern regions of Vietnam Nam, and to serve as a regional training Centre that could be replicated to other regions'.

## 2.2. Interpreting the Terms of Reference

### 2.2.1. Suggested activities

The terms of reference for the sub-contract (i.e. to achieve the objectives b) and d)) foresaw four types of activity:

- a) research and development activities;
- b) supply and installation of equipment activities;
- c) training activities;
- d) development support communications activities.

In the subsequent sections of both Part 1 and Part 2 of this report we will elaborate on how each of these have been addressed.

The ToR and supporting documents provided by CERPAD/CATTIC staff during the pre-contract visits by DW/GRET\* staff oriented the choice of technologies towards four subject areas with problems requiring attention:

- \* the construction of housing, small communal buildings and roads;
- \* small scale energy requirements;
- \* water supply and sanitation.

The ToR suggested that for construction, attention should focus especially on the use of earth construction techniques - albeit that, for example, in practice in Ninh Van commune the main resource turned out to be stone -, with a secondary focus on "other local building materials". On the other hand, those technologies which are listed under "small scale energy systems" reflected a broader range of possible options, some of which were being tried out already in the communes where activities had already been initiated in the 'pre-project' phase of work.

\* DW/GRET - a consortium of two NGO's, Development Workshop and the Groupe de Recherche et Echange Technologie), both with offices in France, and working together as a consortium on the VIE/86/020 project and two other UNCHS projects in Vietnam (VIE/85/019 and VIE/89/035).

In effect, what the ToR asked for was the pre-identification of 'appropriate' technologies which could then be applied to pilot communes, with an explanation of why the technology would be suited to the Vietnamese context, and with reference to previous use in other countries. The equipment for the chosen technologies would be supplied and installed, followed by training with the necessary support documents, and the setting up of the necessary associated light building materials testing laboratories and field testing equipment.

### 2.2.2. Responsiveness rather than pre-determination

In preparing the bid proposal, DW/GRET commented that the suggested pre-determinative approach, where technologies would be developed and then subsequently applied to communities, has *very rarely resulted in sustainable results*. Conversely, DW/GRET stressed that for technical or organizational innovation to be a success within the field of rural development, paramount importance must be attached to assuring that innovation is both wanted by the end users, and reflective of the resources that are available and that can be allocated to it in a sustainable manner. In short, the choice of innovation or action should be driven by the needs and resources of the different communes, and not dictated to them in the light of what is available to the Centre.

To this end, the DW/GRET proposal rested on the principle that, in developing a programme of technical support to communes which is to be replicable, it is essential to begin by developing local skills for:

- analyzing local needs and resources;
- carrying out feasibility analysis of possible activities to respond to these needs; and,
- continuously evaluating the product and process that are proposed as a solution, and the methods which are being used to promote their appropriation by the target group concerned.

Developing a structured methodology for carrying out this process of analysis and evaluation has thus formed the backbone of the programme, by providing the criteria against which to select 'appropriate' technical or organisational innovation, and against which these actions can be reviewed and in the event modified as necessary. Focus has also been placed on using ongoing evaluation and criteria as tools for identifying at what point one should curtail the development of actions which are unlikely to be taken up and used by the people the project is trying to assist in the rural areas.

For identified problems, the research and development of ideas and skills have also been necessary, albeit focussing not only on technical issues, but also, as the project has developed, shifting emphasis towards considering financial, organisational and communication issues, all of which should play an increasingly important role in future. It is also clear that, as highlighted in the sub-contract water supply and

sanitation report<sup>\*</sup>, most applicable and *sustainable technologies already exist in Vietnam*. The report concluded that *'adaptation to local conditions and needs, cost reduction, and promotion activities are more relevant than the introduction of new technologies'*. As such, an important potential strength of CERPAD that should continually be developed is its ability to listen and respond to the demands of the rural areas, and thus ensure that actions respond to their needs, and that techniques which are proposed are adapted to the local resources and socio-economic context.

This point should also be seen in light of the fact that other more specialist institutions already exist in Hanoi and elsewhere in Vietnam. These include the Institute of Building Materials (also funded by UNDP), with whom CERPAD has already collaborated in helping make their products more relevant to rural needs, and on whose services CERPAD can draw. The aim has not been to replicate in CERPAD skills which already exist in the country, but instead to complement them with an understanding which others do not possess.

## 2.3. An evolving institutional and organisational framework for the project

Certain circumstances and changes in procedures during the duration of sub-project inputs have influenced the progress and the structure of the VIE/86/020 project and should be mentioned in order to make the work context clear.

The VIE/86/020 project was originally envisaged as an operation using the Institute for Urban and Rural Planning (IURP) and the Transfer Centre for Appropriate Technology in Construction, (later known as CATTIC). Work started in what became known as the "Group A" communes at least 18 months prior to the formal VIE/86/020 project start in October 1990, using start up funds in the preparation phase of the project. In this 'pre-project' period it was envisaged that work would be on a commune-by-commune basis, and a working practice was established: IURP prepared a very detailed commune level master plan, whilst taking into major consideration the technologies which CATTIC dealt with; CATTIC then implemented these technologies in the commune, as a direct action involving intensive site supervision. To a great extent, choice of technology was determined by CATTIC capacities, rather than to any significant extent by commune needs, resources and the local potential to sustain and replicate new ideas. This situation was commented on in the DW/GRET technical proposal, and was subsequently reflected in the results of the November 1990

\* 'Ninh Van Commune, Ha Nam Ninh Province - Water supply and sanitation. Technical report' CERPAD - DW/GRET, April 1991

evaluations carried out by CERPAD with DW/GRET assistance in Hy Cuong, Dai Ang and Yen Bac communes'. (see section 2.4.)

At the real start of the formal VIE/86/020 project and the creation of the National Centre for Rural Planning and Development (CERPAD) in late 1990, (envisaged in the project document as an offshoot of IURP), created in practice an institutional relationship with CATTIC which was different from that foreseen in the project document as a collaborative effort between the two organizations. In effect, whilst some staff were seconded to CERPAD from CATTIC, since the start of the formal project phase CATTIC has not been actively involved in the VIE/86/020 project (nor with the VIE/86/020 sub-contract for whom they were the designated partners), and CERPAD has thus worked on its own with project staff and sub-contractors. This split created a number of problems, not least of which has been lack of space for installing equipment.

## 2.4. A new operational perspective

At the start of VIE/86/020 sub-contract on Appropriate Technology Transfer in Construction in October 1990 DW/GRET and CERPAD staff carried out an evaluation of the work carried out in the "Group A" communes'. They concluded that insufficient attention had been paid to resource analysis, comparative costing analysis, and feasibility analysis of different technical options based on appropriate performance criteria. Whilst some of the technologies applied in Group A have been technically viable, the constraints of the socio-economic reality have meant that they in most cases suffered from a low potential for replicability. External funding made it possible to introduce prototypes into the villages which could not then be replicated because of the low local economic potential. This situation could have been redressed if more of an effort had been made by CERPAD to see how their prototypes could be made more accessible and affordable.

A product could be shown, but in some cases the method by which it had been selected could not. In almost all cases detailed specifications and accurate costings could not be provided, nor an analysis of affordability. More fundamentally, where CERPAD technical and financial support to a commune had ceased, the replication of the introduced techniques in almost all instances had ceased too. These were, and to some extent, remain, points of concern if one accepts that sustainable, and for many items, replicable results are important objectives in rural development activities. A second case for concern was that in the "Group A" communes sound criteria against which to base one's decisions about choice of action, and against which to monitor and evaluate the process and the results. These had been sadly lacking, even though in

\* See Reports: 'Hy Cuong Commune, Vinh Phu province - Evaluation Report'; 'Yen Bac Commune, Ha Nam Ninh province - Evaluation report'; & 'Dai Ang Commune, Thanh Tri District, Hanoi - Evaluation Report' CERPAD & DW/GRET, November 1990

\*\* Op.cit.

setting up the evaluations it was possible to establish a list of some realistic criteria to be applied in the context of four different target groups - the collective community, rich families, medium families and poor families. One can note here that the majority of "Group A" actions were unable to reach the poor families, even though in discussion they were regarded by CERPAD staff as being the key target group.

Concern about the way in which work was being done in the communes was paralleled at the planning level, and, simultaneously in late 1990, the consultant in social planning techniques, Eric Whist, also carried out an evaluation of work in the Group A Communes in September 1990, and pointed to the fact that CERPAD had a national mandate, which would not be attained through the direct involvement of CERPAD in the development of individual communes at the level of producing detailed master plans. In effect, the practice of working with detailed master plans for each commune followed by practical action implementation with the direct and substantial involvement of the CERPAD technical staff, was only feasible as long as:

- a) CERPAD was only dealing with a very small number of communes, without a view to replicate an approach on a national scale;
- b) the choices of technology were in accordance with the restricted range of expert skills available within the Centre.

In practice, neither of these conditions have been conducive in developing the direction in which CERPAD has been encouraged to develop by the VIE/86/020 project, namely to gradually strengthen a local capacity to improve conditions.

## 2.5. A re-structured approach and the need for a revised staffing profile

Beginning with the formal project period starting in late 1990 an effort has been made to restructure both the organisation and the working approach of CERPAD and its actions in the VIE/86/020 project.

(i) In October 1990 the TPR modified the project approach, moving away from a 'commune by commune' programme to a planning approach involving a provincial level infrastructure planning exercise. One consequence of this was that the 'detailed master plan' approach would no longer be viable. CERPAD had to develop a faster and more easily replicated planning approach, which would enable the Centre to provide planning assistance in an increasing number of provinces leading to the identification of those communes which require priority assistance.

(ii) At the start of the formal Project phase in October 1990, plans were made to initiate actions in a new set of communes, "Group B", which in the event were located in Ha Nam Ninh and Vinh Phu provinces. This provided the context for a fresh start. CERPAD has continued to have interventions in the "Group A" communes, but, with the

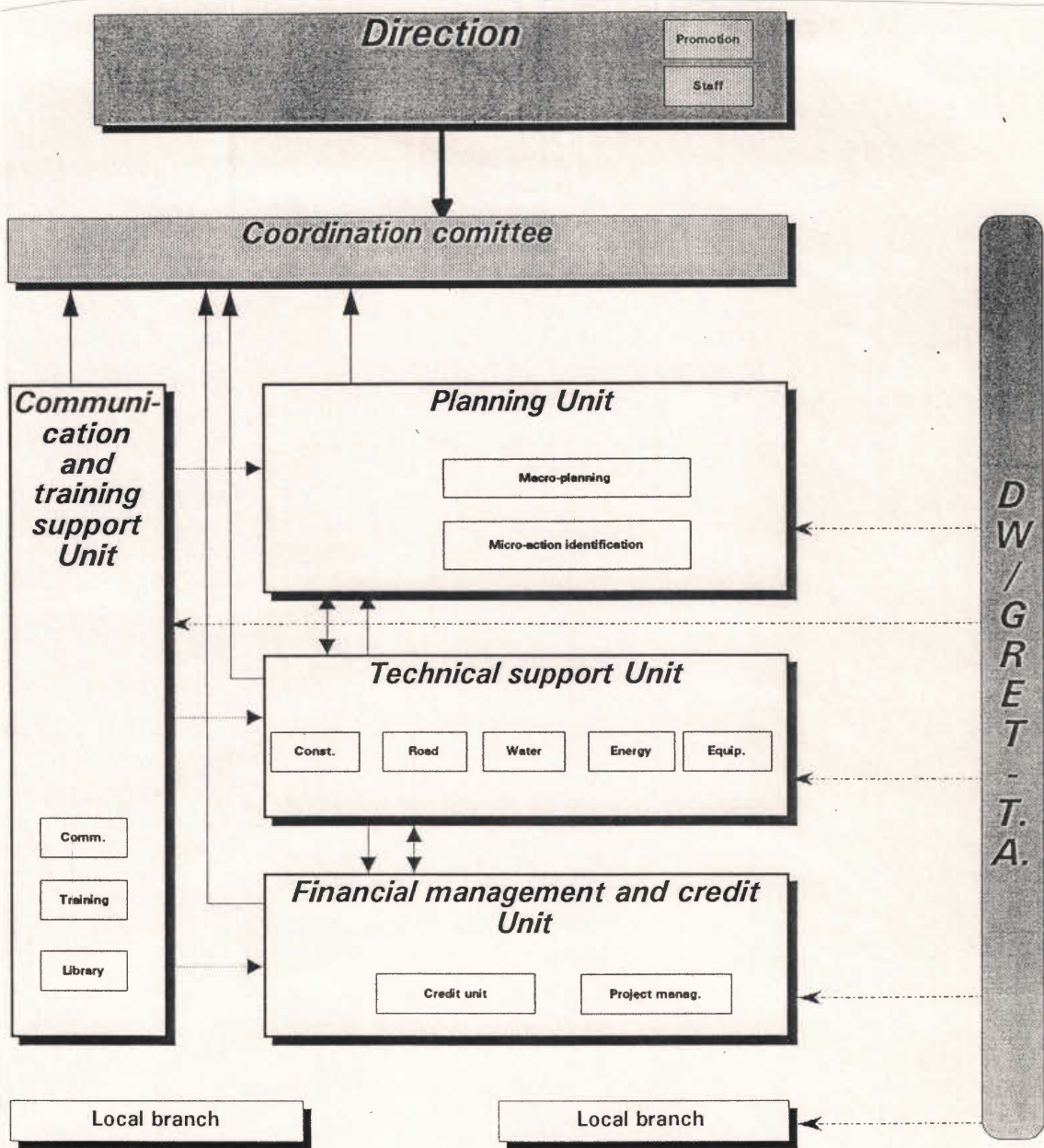
exception of the initial evaluations<sup>\*</sup>, no other direct action has been taken under the auspices of the sub-contract in the "Group A" communes.

(iii) After reviewing the skills and structure of CERPAD in November 1990 the sub-contractors recommended that the centre add to its original staffing - planners and technicians - additional skills, notably those of a communication specialist, an economist, an ethnologist and a community worker. In the Joint Project Assessment in October 1991 these same issues were raised, since in practice little change had taken place in the operational structure of the centre and its personnel. The diagramme reproduced opposite outlines what is essentially the necessary structure for the operation of CERPAD, and to which the project and the sub-contract has been working. This called for a core team of planners working in close cooperation with an action identification team, both of which would fulfil an essential role of *training local counterparts in all their activities*. The sub-contract has then worked towards seeing the development of support elements in the fields of technical issues, financial planning and credit management, and communication support, with varying degrees of progress. Of these, the technical services have advanced the most, since these were the skills that already basically existed in CERPAD (roads and energy) or had been seconded from CATTIC (water and building materials), whilst almost no progress has been made on developing the financial management and credit system service capacity in CERPAD, basically because none of the staff had the necessary skills. CERPAD has for much of the sub-contract period still maintained a strong practical implementation and supervision attitude, and some staff members have found it hard to accept a new role that of *actively developing skills in others* - for example, training good road designers and builders, rather than undertaking road building as a CERPAD supervised activity - training tended to stop short at organising meetings to explain the requirements of labour, material supplies etc.. An exception has been the small training workshop for tile production with local stone dust in Ninh Van, and it is in this latter direction that initiatives could have been and need to be more actively taken up by the CERPAD team in promoting other aspects of the programme - making water filters, making stoves, etc. locally. It is in this sense that the skills of community workers, communication specialists and trainers, economists and people with credit skills would have helped in *shaping the interventions into replicable actions*, which the community and families could produce and/or operate themselves. One should, however, recognise that some of the staff had been brought to CERPAD prior to the formal Project period, and have not necessarily had the skills or potential suited to the tasks which they have subsequently been asked to undertake. It is to be hoped that in the future, CERPAD will achieve the staff expansion and change that it needs to be able to fulfil its mandate.

On the subject of staffing, the capacity of CERPAD to ensure sufficiently good interpretation between Vietnamese and English has also often been poor, and in 1992 depended on using the skills of technical staff in the Centre who speak either some French or English. This has made communication frustrating for both parties, and

\* See Reports: 'Hy Cuong Commune, Vinh Phu province - Evaluation Report'; 'Yen Bac Commune, Ha Nam Ninh province - Evaluation report'; & 'Dai Ang Commune, Thanh Tri District, Hanoi - Evaluation Report' CERPAD & DW/GRET, November 1990

### Diagramme of the recommended CERPAD structure



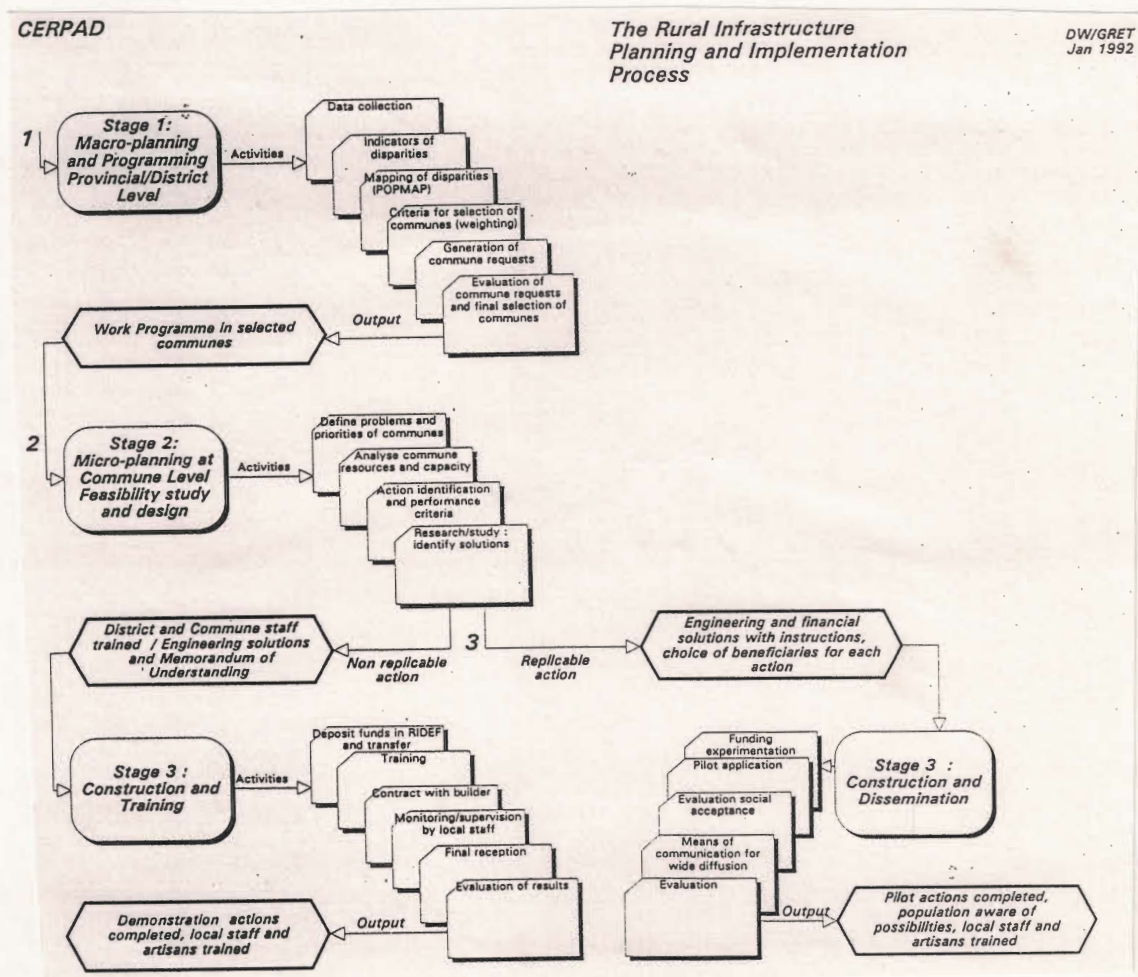
**CERPAD**  
*Rural Infrastructure Planning and Implementation Services  
 For Provinces, Districts, Communes in Vietnam*

DW/GRET  
 Jan 1992

has inevitably contributed to delays and misunderstanding. Linguistic skills need to be developed within the Centre to overcome this problem.

(iv) In re-structuring the project approach, in the "Group B" communes the sub-contractors DW/GRET initiated a working method for the identification at commune level of needs, resources and potential solutions, and for the ongoing evaluation of actions. Starting by developing a methodical approach to problem identification and solution within CERPAD, focus has then shifted towards developing the district and commune skills to manage this work, and thus to gradually replace the earlier practice of direct CERPAD intervention. The sequence of operations which the sub-contractors DW/GRET introduced\* fitted into a three stage sequence of project events\*\*, reproduced below, of which the first stage concerns the planning and commune selection process, and of which following two form the basis of the sub-contract operations related to the identification, experimentation and dissemination of appropriate actions in rural communes.

*The Rural Infrastructure Planning and Implementation Process*

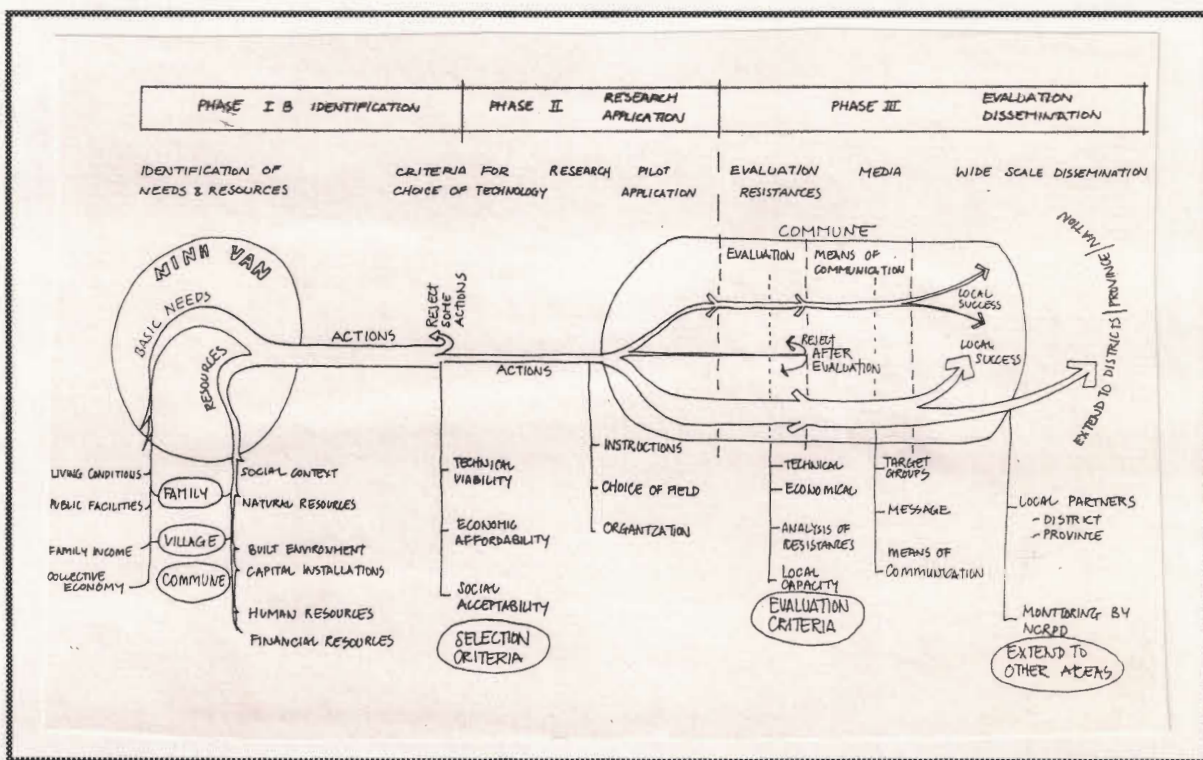


\* See: VIE/86/020 rural Settlements Planning - Subcontract in Appropriate Technology Transfer in Construction - Inception report' Development Workshop & GRET, November 1990

\*\* See: 'A joint project assessment' Development Workshop & GRET, and Eric Whist, October 1991

### 3. Programme development in the "Group B" communes

The progress of work in the "Group B" communes can be divided into several phases relative to putting into place an operational method for rural development assistance. The overall process that has been presented in the project was shown graphically in the Ninh Van Commune first report\*, where one can also see key points in the development or rejection of actions.



#### 3.1. Phase 1. Action in Ninh Van commune: identification, analysis and experimentation

After the evaluation work in the three Group A communes, the first phase in "Group B" communes took place in Ninh Van commune, starting in November 1990.

\* 'Ninh Van Commune, Ha Nam Ninh province: Basic needs and local resources - Proposed actions; 1st Interim Report, NCRPD - DW/GRET, December 1991

## Survey

This survey phase concentrated on developing the necessary working methodology within the CERPAD team for the sound identification of problems and areas where action could be taken. The next two pages show some of the survey tools used in this process. These survey sheets were subsequently reproduced in Vietnamese for use in the Vinh Phu communes (see 3.2.). In Ninh Van these surveys were undertaken by a small team of CERPAD staff, including a planner and technicians, who worked in collaboration with members of the People's Committee of Ninh Van commune, who also contributed information. Information was gathered through household enquiries, discussions with the local producers - such as those working on stone crushing - and consumers, and overall results were complemented by notes based on observation. The results were collated in the form of analytical tables reviewing, for example, the families' accessibility to different items - house, latrine, ox-cart, radio-set, etc. - in the light of their monthly incomes and the saving potential for different income groups. These highlighted how very little capacity the very poor (45% of the commune population) have to invest in things which could improve their lives, and emphasized the important impact access to credit would have in household development. The survey also highlighted the importance of working not only on social infrastructure facilities at commune and household level, but also of working to develop the economic and productive capacity of the commune, including exploring the potential for improving and setting up productive activities and developing the economic infrastructure with techniques that can be sustained by the commune. A more rounded out review of the commune situation was presented in a report on the data\* - covering additional aspects such as climate and economic activities. Similar reports were later prepared by CERPAD for the Vinh Phu communes.

### Family economics and accessibility of different items in Ninh Van commune

#### Family economy in Ninh Van

Category / % of population		Rich 15%		Medium 40%		Poor 45%	
Average income Dgs/ month *		200 000 < 300 000		60 000 < 100 000		30 000 < 50 000	
Saving Dgs/year		1 000 000		Up to 300 000		Less than 100 000	
	Cost in Dgs	Monthly income	Yearly saving	Monthly income	Yearly saving	Monthly income	Yearly saving
House	5 000 000	25.0	5.0	83.3	16.7	166.7	50.0
Latrine	150 000	0.8	0.2	2.5	0.5	5.0	1.5
Water tank	250 000	1.3	0.3	4.2	0.8	8.3	2.5
Well	80 000	0.4	0.1	1.3	0.3	2.7	0.8
Bicycle	130 000	0.7	0.1	2.2	0.4	4.3	1.3
Tet	100 000	0.5	0.1	1.7	0.3	3.3	1.0
Radioset	300 000	1.50	0.30	5.0	1.0	10.0	3.0
Oxcart	1 200 000	6.00	1.20	20.0	4.0	40.0	12.0
Grinding machine	4 000 000	20.00	4.00	66.7	13.3	133.3	40.0

\* Including rice production  
Source : NCRPD-DW/GRET\* Dec 1990

\* 'Ninh Van Commune, Ha Nam Ninh province: Basic needs and local resources - Proposed actions; 1st Interim Report, NCRPD - DW/GRET, December 1991

# Data collection forms - household level survey of the built environment

VIET/86/020 DATA SHEET SURVEY OF BUILT ENVIRONMENT

## Survey of built environment

### GENERAL INFORMATION

Location: TRIEN DUONG - NINH VAN  
 Name of householder: PHAM THI CAC - 60 YEARS OLD.  
 Size of family: 5 (MOTHER AND 4 CHILDREN FROM 15 TO 8 YEARS)  
 Occupation: STONE WORK, PEASANT.  
 Description of family activities:  
 - RICE CULTIVATE WITH BUFFALO HIRED FROM OTHER  
 - VENDOR IN SPARE TIME WITH VERY SMALL SUM.

VIET/86/020 DATA SHEET SURVEY OF BUILT ENVIRONMENT

Average income: 700

### MAIN HOUSE AND OTHERS CONSTRUCTIONS

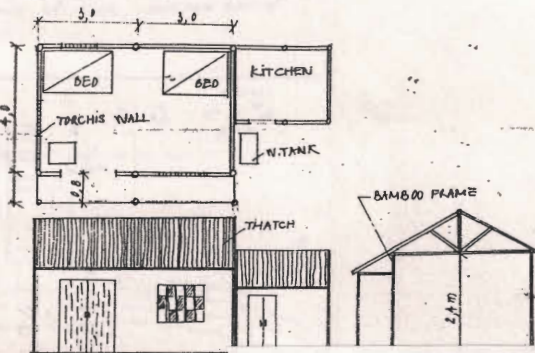
#### SITUATION

Topography: PLEIN ARE  
 Climate:  
 Environment: FLOODING

#### PLOT

Plan

Plans, elevations, sections and organization



Total area: 360 M<sup>2</sup>

(Indicate location of house, services, activity)

VIET/86/020 DATA SHEET SURVEY OF BUILT ENVIRONMENT

#### Description of building materials

House  
 - foundations: BRICKS  
 - structure: FRAME  
 - walls: BRICKS  
 - roof structure: BAMBOO  
 - roof covering: THATCH  
 - joinery: BAMBOO  
 - others:

Area : 360  
 Cost Dgs/m<sup>2</sup> :  
 Date of completion: IT WAS COLLECT AS A H

NOVEMBER 1990

#### SERVICES

	Water (domestic use and activity)	Sanitation	Energy supply (domestic and activity)
Inside the house:	/	/	PROPANE LAMPS.
Inside the plot:	SMALL TANK NO COVER	X	/
Access outside:	COLLECT FROM RIVER	/	NO
Description:	/	/	/
System:	NO	SIMPLE HOLE DIG IN THE EARTH	TRADITIONAL STOVE
Quality:	/	BAD	/
Quantity:	100 L	SMALL	/
Cost for setting:	/	/	/
Maintenance:	/	/	/
Evaluation:	BAD CONDITION	VERY BAD CONDITION	CONSUME TOO MUCH FUEL.

#### NEEDS / PROJECTS

Main problems or difficulties:  
 - SHORTAGE OF FUEL 2-3 MONTHS PER YEAR.  
 - THE EXISTING HOUSE IS IN BAD CONDITION  
 - SHE HAS TO BORROW MONEY WITH HIGH INTEREST  
 - SHORTAGE OF FACILITIES: WATER TANK, WELL, LATRINE, STOVE.  
 Projects:  
 - WANT TO BUILD A NEW HOUSE.  
 - IT'S NECESSARY TO BUILT HOUSE FACILITIES, SPECIALLY LATRINE, STOVE AND FILTER TANK.

NOVEMBER 1990

DW/GRET



### Analysis of commune potential

In order to help the CERPAD team focus on feasibility and requirements for achieving the selected actions, summary tables also reviewed:

(a) the potential that the commune could mobilize - its social capacity to organise, the labour that could be called on for a programme, the materials and money that might be available -

and then:

(b) reviewed what human resources CERPAD would also have to devote to achieve the different identified actions. The latter drew attention to the need for inputs by some professional profiles which were not actually available to CERPAD and which would thus have to be developed or brought in.

### Resource and capacity mobilization in Ninh Van

Level	Type	SOCIAL	NATURAL	BUILT ENVIRONMENT	CAPITAL INSTALLATION	HUMAN RESOURCES	ECONOMIC RESOURCES
Family Level		* Mutual help				* 2-3 / family	
Global							
Rich				* Stone house * Well, tank, latrine	* Stone production equipment * Rice mills * Ox carts	* Skilled labour : - stone - Construction - Management	Saving (Dongs/year) 1 000 000
Medium				* Stone/block house * Wall		- Embroidery	< 300 000
Poor				* Thatch house * No services		* Unskilled labour	< 100 000
Village Level		* Relative support and help		* Kindergarten * Public wells * Churches, temples, common house (Dinh) * Intervillages roads	* Rice storage * Stone production groups * Pumping station	* 10 working days/person for collective work for Commune and District	
Commune Level		* Chairman of P/C * Women Organ. * Education service * Support from District	* Stone * New lands * Rivers	* Schools (1,2) * Clinic * Administration * Open theatre * Shops, market * River, roads	* Cement and lime factory (nearly closed) * Stone cutting workshop * Electricity	(1700 p. X 10d.) * Low capacity for management	* Budget :20 Millions Dongs * Credit Cooperative : 5 millions Dongs * Contributions from Enterprises and District
Conclusion on local capacity		- Local authority - Women org. - Education - Mutual help	- Stone - New lands	- Fully equiped	- Old equipment for large plants  - New small enterprises (stone)	- Skilled labour for stone work - Low capacity for collective management - Capacity for private initiatives - People participation to collective works	- Low budget (2 \$/family)  - Low income from agriculture and stone hand work

### Resource and capacity mobilization - Ninh Van commune

### CERPAD skill inputs needed for each action

N	Action	Phase II Research		Phase II Application		Phase III Eval./Dissem.		Specialist										TOTAL			
		Dur.	Input	Dur.	Input	Dur.	Input	Coor	B.Ma	Com	W/S	Tra.	Econ.	Soc.	Co.w.	Archi	Meca		Man.		
1	Housing improvment	2	1	2	1	2	0.5		2						0.5						2.5
2	Integrated water filter/tank	3	1	1	0.5	6	1.5		0.25	1	1.75										3
3	Latrines	2	0.5	2	0.5	6	2		0.5	1	1				0.5						3
4	New settlement planning	3	2	3	0.5	6	2					0.5			1	0.5	2.5				4.5
5	Road Hai Nhan	8	2.5	2	1	1	1		0.5	0.5			2	1				0.5			4.5
6	Village well	2	1	2	0.5	6	1		0.5	0.5	1						0.5				2.5
7	Roads maintenance	8	2.5	3	1	1	0.5				1		2			0.5		0.5			4
8	Credit system	3	2	3	0.5	6	0.5							2.5			0.5				3
9	Stone production	1	1	4	2	6	1		0.5					0.5					2	1	4
10	Village market	2	1	4	2	2	0.5		0.5					0.5			2.5				3.5
11	Road Van Le - Tam Diep	3	1	1991		1991						0.5	0.5								1
12	Local capacity Rur.Plan.	2	0.5	6	1.5	4	1			1								2			3
13	Coordination		2		2		2		6												6
TOTAL			18		13		13.5		6	4.75	5	3.75	5	5	2	1	8	3	1		44.5

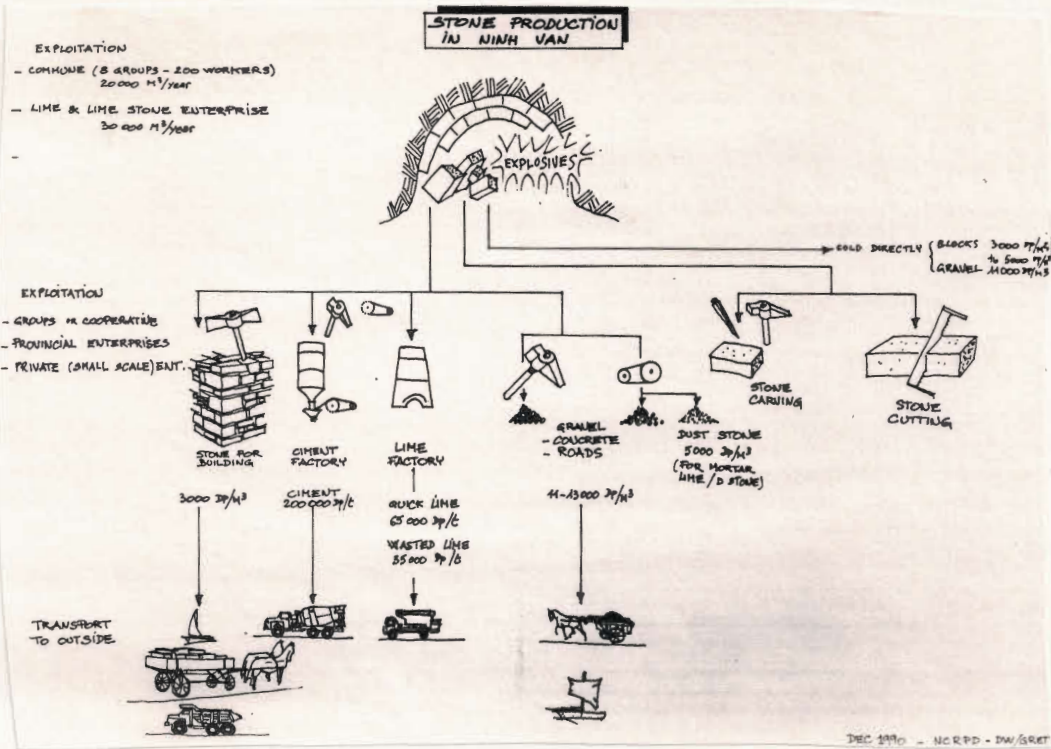
TOTAL INPUT NCRPD ( man.month)

44.5

TOTAL INPUT DW/GRET ( man.month)

7

Summary analysis - stages in the cycle of stone production in Ninh Van commune



Working dossiers

Once the field analysis stage complete, CERPAD then proceeded to develop detailed 'working' dossiers - based on the information provided in the 'Criteria for choice of technology' sheets which had been completed based on the information gathered during the survey.

Each dossier needed to be understandable by the commune and district counterparts, and emphasis was placed by the sub-contractors on making sure that the working documents in the dossier were accurate in order to allow careful monitoring and to allow a third party - such as a local contractor or the people's committee - to implement the work. In practice, during the first year of work, whilst a few of the

Criteria for choice of technology form

Criteria for choice of technology Proposed action

- Problem :
- Objective :
- Beneficiary :
- Action :

Criteria	Stage		
Technical			
Viability			
Economical			
Affordability			
Social			
Acceptance			
Key points			

Work plan :

dossiers were well prepared - for example that for the New Settlement at Van Le - other dossiers required a great deal of effort and revision before they could seriously be considered of acceptable technical and financial standard and of sufficient quality to form the basis on which funds in the sub-contract could be released for initiating prototype actions.

It has been repeatedly necessary to stress that if the information in a technical dossier is not correct, particularly in terms of costing or technical detail - which was far too often the case - then it represents passing on inaccurate information to the commune, making both execution and replication very difficult. An example, in passing, of the effect of incomplete information was well illustrated in Ninh Van commune, where complete chimneys were not shown on the drawings for 'improved stoves'.. with the result that ten examples that were built in the commune did not have complete chimneys either. Since this identical problem had already been pointed out in the

**Cement tile tests - using local stone dust to replace sand**

Ninh Van pilot action Cement tiles tests : Technical dossier 3

**10. Detailed implementation**

Pilot application by experim  
also the training course for tile  
areas to chose a reasonable c

2 Cement tiles tests : Technical dossier Ninh Van pilot action

**11. Media proposed for**

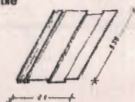
Cartoons/Pictures/Drawing sh

**12. Budget**

PHASE 1. Research	
Total	C/U/D/F
271,000	

**6. Design detail**

Testing with two sorts of.  
Ninh Van tile



The materials required:

- 1. Stone dust
- 2. Bimson cement
- 3. Heduong cement
- 4. Sand
- 5. Additive "PG2"
- 6. Tile mould
- 7. Red colour

**7. Construction process**

- a. The engineer groups of IBM will produce 30 experimental tiles with c of IBM tiles using local materials.
- b. In Ninh Van, based on the chosen Use a vibrator to improve the tile. Lo
- c. Evaluation.

**8. Materials quantities, cost**

ITEM	QTY	COS
1. Stone dust	0,4 m <sup>3</sup>	10,00
2. Bimson cement	100 kg	40
3. Local cement	100 kg	26
4. Additive "PG2"	3 kg	1,80
5. Moulds	5	4,00
6. Produce tile	4 w.d	8,00
7. Test the tile	24	1,00
8. Select mortar		
9. Red powder	1 kg	20,00
10. Rent of vibrator	10 d	5,00
<b>TOTAL</b>		

**9. Maintenance and operat**

After the evaluation, if there are some and composition as well as curing technology, operate the vibrator, an to control periodically parameters of

Ninh Van pilot action 1.2 Technical dossier

**Cement tile tests**

VIE / 86 / 020

CERPAD

**1. Context**

Cement tiles in Ninh Van are now very popular, and most houses in the mountainous area of the Hoa Lu District are covered by cement tiles. Red tiles are expensive and rare. Cement tiles are made from local cement or Bimson cement, (in the market 10km away) and sand. Tile technology is very simple and popular, and so workers can produce it for selling or the consumers can hire the workers to produce tiles on site. One cement tile has a dimension of 0.35x0.21cm, 22 tiles/m<sup>2</sup>, 2.2kg weight (45kg/m<sup>2</sup>). Meanwhile, Ninh Van produces the stone therefore stone dust is available and cheap (10,000dg/m<sup>3</sup>). The Institute of Building Material (IBM) and the Ministry of Construction is currently in the application phase of the cement tile project using vibrators and special moulds that can produce other types of cement tiles with a lighter weight. An IBM tile has dimensions of 0.50x0.24 (13tiles/m<sup>2</sup>), and a weight of 1.8kg, 24kg/m<sup>2</sup>.

**2. Statement of the problem**

Ninh Van cement tiles are heavy and therefore requires a heavy roof frame. The price of a tile is 300 dg/tile and 6,600 dg/m<sup>2</sup>; therefore the roof cost is a high proportion of the house cost. In Ninh Van, many houses have been built with foundations and walls but have to wait years for a roof.

**3. Objectives**

- These are :
- \* to reduce the roofing costs by using stone dust and local cement to make cement tiles;
  - \* to improve the quality of Ninh Van tiles;
  - \* to check the possibility of IBM tiles using local materials.

**4. Innovation being proposed**

- To use vibrators to increase the density of mortar by IBM's method or by Ninh Van's method.
- to use additive "PG,2", the additive produced by IBM for ease in mixing the mortar when using stone dust replacing sand (1.5% cement).

**5. Criteria used for selection of innovation**

- \* using local materials,
- \* reducing the roof costs including roof coverings and roof frames,
- \* making sure technology is easy and available,
- \* ensuring the quality of tile has reached the national standard: loading 50kg/tile, waterproofing viable for 24 hours under a water column of 50cm,
- \* typhoon resistance: easy to fix tiles to roof frame.

CERPAD / DW-GRET

VIE/86/020

Development Workshop

Center for Rural Planning and Development Hanoi-Vietnam

GRET

evaluation of actions in Yen Bac commune (a "Group A" commune) several months before, one would have hoped to see an effort to ensure that in this subsequent operation in Ninh Van correct information would be passed to the commune.

However, in looking at the progress of technical information being prepared by CERPAD, by January 1992 there were signs of a net improvement for Ninh Van commune dossiers, and this progress has by and large continued to be the case in Vinh Phu communes' action development.

This and the preceding page show an extract of the dossiers that were produced as a result of the surveys. A summary table of all Ninh Van commune actions is produced in section 3.3.1.

**Commune market - a programme to promote economic activity and demonstrate materials which needed careful financial analysis in its planning**

Ninh Van pilot action Technical dossier : Commune market 5

**2. Advantages and disadvantages for the market construction**

- \* Ninh Van market is situated in an area whic
- \* Materials are available, such as stone, He Du
- \* As labour force, masons and builders are ava
- \* Especially, in the commune there is now a dev
- \* The Committee of commune leaders are you

Finally, to improve and expand the market is an support.

**3. Objectives**

- Ninh Van market construction aims at providing solutions:
  - make use of materials available in the comm
  - demonstrate good stone building techniques
  - demonstrate typhoon resistant construction
  - improve experience in mobilizing and making market.

**4. The main problems to be studie**

- \* Build the foundations with stone.
- \* Construct stone arches instead of large spar
- \* Combine wood frame structures and stone v
- \* Develop the use of stone dust and cement til
- \* Combine different types of roofing structure.

**5. Performance criteria for the ch**

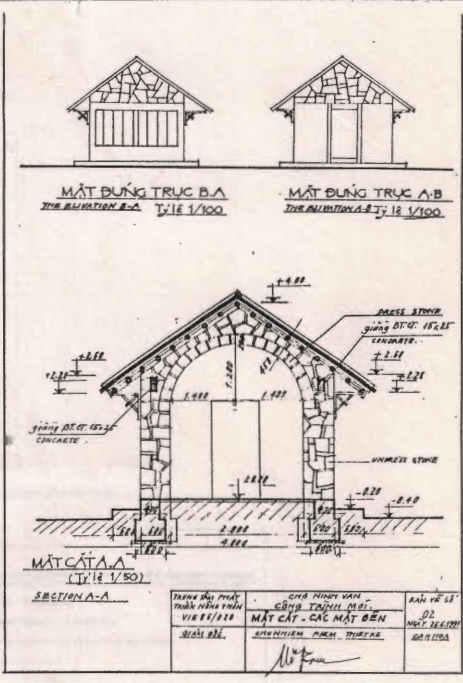
- \* Materials must be as much as possible from
- \* Costs must be low.
- \* Construction must be durable and safety
- \* Building must be suitable for commune abilities

Technical dossier : Commune market

**7. Costs estimate (Dongs / October 1991)**

(See detailed costs in Part II)

Action 1: Expand market	8 652 000
Building materials:	7 695 000
Labour:	957 000
Action 2: Construction of new building with 7 rooms by stone and cement tiles.	10 995 000
Built area:	115 m <sup>2</sup>
Veranda area:	52 m <sup>2</sup>
Building materials:	8 421 000
Labour:	2 577 000
Action 3: plaster outside market yard (300 m <sup>2</sup> ).	845 000
Building materials:	690 000
Labour:	255 000
Action 4: Twin latrine (for man and women)	1 732 000
Building materials:	1 338 000
Labour:	394 000
Action 5: River stone bank (8 = 4,8m)	612 000
Building materials:	432 000
Labour:	180 000
Action 6: Improvement the old building	8 838 000
Building materials:	6 524 000
Labour:	1 784 000
Action 7: Water filter tank (V = 10 m <sup>3</sup> ).	
Building materials:	1 816 000
Labour:	680 000
Action 8: Market gate.	
Building materials:	348 000
Labour:	82 000
TOTAL:	
Action 1:	8 652 000
Action 2:	10 995 000
Action 3:	845 000
Action 4:	1 732 000
Action 5:	612 000
Action 6:	8 838 000
Action 7:	2 505 000
Action 8:	430 000



**8. Construction process**

According to commune report:

- The old building will be improved then sold to people having boat 1993.
- User capital (1991 - 1992): 30 x 1
- The market size: 1 000 000 Dgs
- The commune labour is about 2K

This budget is limited so the market

Phase 1: carry out in 1991 - 1992:

Total:	22 558 000
Material:	18 546 000
Labour:	4 393 000

Phase 2: carry out in 1992 - 1993: sections 6, 7, 8.

Total:	9 743 000
Material:	7 187 000
Labour:	2 556 000

Note: action 1 start in September - October /1991.

**9. Manage market operation:**

The board of management must be stabilized in order to understand good market operation, including 1 - 2 persons.

- Task's management board:

Maintain market operation everyday, make market clean and in order after market day (control, water filter tank, sanitation). Collect and pay taxes. Every year, market should be maintained and repaired when needed.

**10. Budget breakdown**

N. Item	User	Commune	Project	TOTAL	%				
1. General overhead		2 852 000	89%	2 553 000	25%				
2. New building	1 500 000	14%	2 200 000	24%	8 738 000	62%	10 888 000	34%	
3. Market yard		448 000	47%	500 000	53%	845 000	3%		
4. Landscap		1 033 000	56%	700 000	40%	1 732 000	5%		
5. Water tank		812 000	35%	400 000	69%	812 000	2%		
6. Improve old building	8 308 000	57%	600 000	7%	8 908 000	21%			
7. Travel and Maintenance		1 205 000	48%	1 300 000	82%	2 505 000	8%		
8. Market gate		700 000	17%	250 000	3%	430 000	1%		
ALL		8 008 000	29%	13 485 000	41%	31 188 000	74%	33 563 000	100%

## Water supply and sanitation

In march 1991, the sub-contract also supplied an expert in water supply and sanitation, Peter John Meynell, to work with Mrs Lien, the water and sanitation technician of CERPAD. The object of this was to review in detail the needs in Ninh Van commune, and to develop ideas about water filter design, public water-pond treatment, and choice of latrine system. The specialist also helped to define water testing equipment needs that the CERPAD should obtain, and to decide how many tests the CERPAD would be likely to undertake, and thus what stocks of consumables would be needed. This input in turn led CERPAD to undertake some investigation into cheaper water filter solutions. It also resulted in the purchase of water testing equipment. The findings and recommendations of this input and the results on the Ninh Van commune water supply and sanitation surveys have been reported separately\*.

### Water supply and sanitation review for Ninh Van commune

VILLAGE	HE DUONG	VAN LE	PHU LANG	XOM HE	XOM TH.	XUANG VU	CHAN VU	DONG QU.	AVERAGE
Families	176	107	169	242	88	338	279	68	1467
Population	642	486	713	786	264	1172	1403	365	5831
<b>WELL</b>	<b>19%</b>	<b>19%</b>	<b>26%</b>	<b>33%</b>	<b>32%</b>	<b>32%</b>	<b>25%</b>	<b>29%</b>	<b>27%</b>
good q.	100%		30%	40%	30%			20%	26%
medium q.		50%	70%	60%	70%	20%	90%	30%	50%
bad q.		50%				80%	10%	50%	24%
<b>VILLAGE WELL</b>			<b>53%</b>		<b>45%</b>	<b>44%</b>	<b>64%</b>		<b>28%</b>
good q.									0%
medium q.			100%		100%	80%	60%		83%
bad q.						20%	40%		17%
<b>RAINY WATER TANK</b>	<b>26%</b>	<b>23%</b>	<b>23%</b>	<b>31%</b>	<b>26%</b>	<b>30%</b>	<b>28%</b>	<b>29%</b>	<b>26%</b>
good q.	100%	95%	100%	100%	100%	90%	100%	100%	98%
medium q.		5%				10%			2%
bad q.									0%
<b>RIVER</b>	<b>46%</b>	<b>71%</b>		<b>8%</b>		<b>6%</b>	<b>11%</b>	<b>29%</b>	<b>17%</b>
good q.									0%
medium q.	50%	50%		50%		40%	65%	50%	51%
bad q.	50%	50%		50%		60%	35%	50%	49%
<b>POND</b>	<b>31%</b>	<b>19%</b>	<b>41%</b>	<b>41%</b>	<b>51%</b>	<b>38%</b>	<b>54%</b>	<b>14%</b>	<b>36%</b>
good q.									0%
medium q.	40%	40%	50%	45%	74%	35%	40%	60%	48%
bad q.	60%	60%	50%	55%	26%	65%	60%	40%	52%
<b>WATER FILTER</b>						<b>13%</b>	<b>4%</b>	<b>30%</b>	<b>5%</b>
good q.						100%			28%
medium q.							100%	100%	72%
bad q.									0%
<b>LATRINE</b>	<b>28%</b>	<b>28%</b>	<b>30%</b>	<b>33%</b>	<b>46%</b>	<b>38%</b>	<b>36%</b>	<b>29%</b>	<b>31%</b>
good q.	28%	33%	30%	33%	30%	30%	30%	25%	30%
medium q.	12%		10%	30%	25%		70%		20%
bad q.	60%	67%	60%	37%	45%	70%		75%	50%

Note : These data do not include the Workers Village (about 200 families)  
Source : NCRPD-DW/GRET Dec 1990

\* Ninh Van Commune, Ha Nam Ninh Province: Water supply and sanitation, technical report' CERPAD - DW/GRET, April 1991

## 3.2. Phase 2. Vinh Phu Province: developing commune and district skills

In the latter part of 1991 activities began in the two communes of Vinh Phu where CERPAD would continue working over the following 18 months and more. The communes are Thang Son commune in Than Son district and Xuan Vien commune in Yen Lap district. In this second phase of the work the sub-contract accent has been on encouraging CERPAD to develop the commune and district skills in identifying problems and resources, formulating them into viable proposals where support is needed, and in undertaking the actions.

### ***Identification of problem areas***

At the end of the commune identification process, as part of the CERPAD planning operation, each commune had put forward a number of suggestions about what they regarded to be the main problems to be addressed: 'school building and more classrooms'; 'bridges'; 'roads'; 'garden improvement'. These reflected global concerns, but which did not define the nature of the action needed. 'Clinic', for example, was cited as a problem in Xuan Vien commune, but it remained to identify whether this actually meant improving the medicine supply? upgrading the level of hygiene in the existing building? building more rooms? improving access to health facilities? improving public health knowledge? or other issues beside.

### ***1st Workshop***

To develop the commune and district capacity to make clear statement of the problem and how it could be solved, a first workshop was organized by CERPAD and the sub-contractors in October 1991 for district, commune and provincial counterparts\* to present the techniques that would be used for detailed needs, resource and capacity analysis. The workshop also provided the opportunity for CERPAD to talk about some of the possible processes which might be interesting to the area - for example, a presentation of a credit system for rural areas, using the case of the Grameen Bank in Bangladesh. Survey work was then undertaken in the following month, and preparations made for a second workshop, focussing on the feasibility analysis and identification of actions, and the detailed development of action dossiers by the workshop participants\*\*. The workshop presented the results of the surveys, and then moved on to undertake field work in small groups which would lead to the identification of the detailed actions. The CERPAD report\*\*\* on the workshop summarises the process and what was achieved, as follows:

- \* 'Training course for Vinh Phu local staff: progress report' DW/GRET, October 1991
- \*\* 'Second training course for Vinh Phu local staff - progress report' DW/GRET & CERPAD, January 1992
- \*\*\* Two pages of hand written notes included in the main report on the second training course, referred to above.

*'A review was made of the process of commune selection and implementation of rural infrastructure development in all its stages; of the stages of work that had been completed and of that which was currently underway; and of the coordination between counterparts involved in the process.'*

*The workshop 'checked the setting up of the Rural Development Board (RDB) at Commune level (with district support), and what activities the RDB would undertake. The chief planner for each commune then presented and evaluated the results of the surveys that had been done,[..]and identified the priorities for the two communes with an analysis of needs, resources and capacities'*

*This was followed by field works, with the division of participants into groups to study and get more [and] deep(er) information on priorities proposed. Field work involved [examining] public facilities (schools, clinic, market) family credit, family economy, local participation, construction techniques (cost, building material, roofing, walls..), women's participation. Each group worked with a CERPAD member, and there were discussions on the site.*

*Each group then presented its work and proposals, followed by discussion about the data, about new ideas and to discuss the priorities on technologies selected. A final discussion among all participants and commune and district leaders [was held] to get agreement on selected priorities, the place and the size of the works and to draft a plan for the next activity'.*

#### *Planning meeting in Xuan Vien commune*



The workshop developed both skills and the local involvement in the decision making process, and resulted in a draft set of priorities for action. Because some of these plans were more complex than others - for example, the issue of developing a credit system for households - and because commune resources cannot be mobilized for many actions at the same time, it was necessary to set an order on what could start straight away, and which actions needed more preparation time and data gathering. For Xuan Vien commune, the first two actions to start were school building and small dams, and in Thang Son commune, school building and upgrading 1.5 kms of road.

### ***Credit systems***

Meanwhile, initial studies<sup>\*</sup> showed that in both communes some form of *tontine* or individual credit systems were already in operation (five types of *tontine* in Xuan Vien commune, covering food, cash, building materials, roofing palm leaves, and support for funerals and marriages). CERPAD therefore needed to help the communes initiate a more detailed period of feasibility studies, with household studies to examine lifestyle, patterns of work and space use, household economics and seasonal activities, in order to get a better understanding of the nature of required loans and their scale, the potential of repayments, and how a better and more equitable system could be developed. It was envisaged that after a three month study period, it should be possible to initiate a trial period of loan operation with a few families. Delays have in fact meant that this cannot now happen unless the project is extended.

### ***Water, energy and earth wall construction***

After discussion with the CERPAD team, the sub-contractors also recommended that more investigative work was needed on water, energy, earth wall construction methods and costs, in order to find out the following:

- to get a detailed understanding of existing water lifting methods;
- to get detailed comparative knowledge of energy needs for cooking, heating, lighting, milling, baking bricks and other energy needs, so that one could identify which were the real needs for energy, exactly what already exists, and what could be done (Thang Son commune);
- to obtain information enabling a very detailed comparative analysis of the costs and benefits of different earth wall construction techniques, ensuring that the analysis should focus clearly on the benefits to local incomes, and not just take account of the basic cost of different techniques.

In cases where an action had been accepted, work began on the development of detailed dossiers for implementation.

\* Note sur enquête crédit à Vinh Phu' mission note, G.Chantry, January 1992

### 3.3. Phase 3. All "Group B" communes: development and implementation of actions

#### 3.3.1. Ninh Van commune

Prior to and in parallel to developing skills in Vinh Phu province, work had begun on developing the practical actions in Ninh Van commune, the first of the "Group B" communes.

##### **Action areas**

At the end of the identification phase, twenty action areas had been identified in Ninh Van commune, covering a wide range of issues:

- the improvement of building materials;
- developing better water supply and sanitation;
- the development of a new settlement adjacent to a newly proposed road at Van Le;
- the construction of a new road link from Van Le to Tam Diep, a nearby settlement and a potential market for Ninh Van commune products;
- a road maintenance programme with the identification and supply of suitable equipment which the commune could afford to go on operating;
- improvements for stone crushing equipment which could lower costs and improve productivity and thus help stimulate the economy;
- the development of a credit system;
- the development of the commune market facilities aimed not only at providing economic stimulus for the sellers in the area, but also to provide the opportunity for training and the demonstration of innovations in building materials, of which most particularly the use of stone dust instead of sand in mortar and concrete (stone dust being a local by product of aggregate production in the commune), making and using stone dust/cement roof tiles, developing fair faced semi dressed stone walling to reduce dressing and rendering costs, and demonstrating typhoon resistant building details which can be taken up by the public;
- a programme for developing and disseminating improved stoves;
- and finally a programme for developing the commune's organisational and training potential.

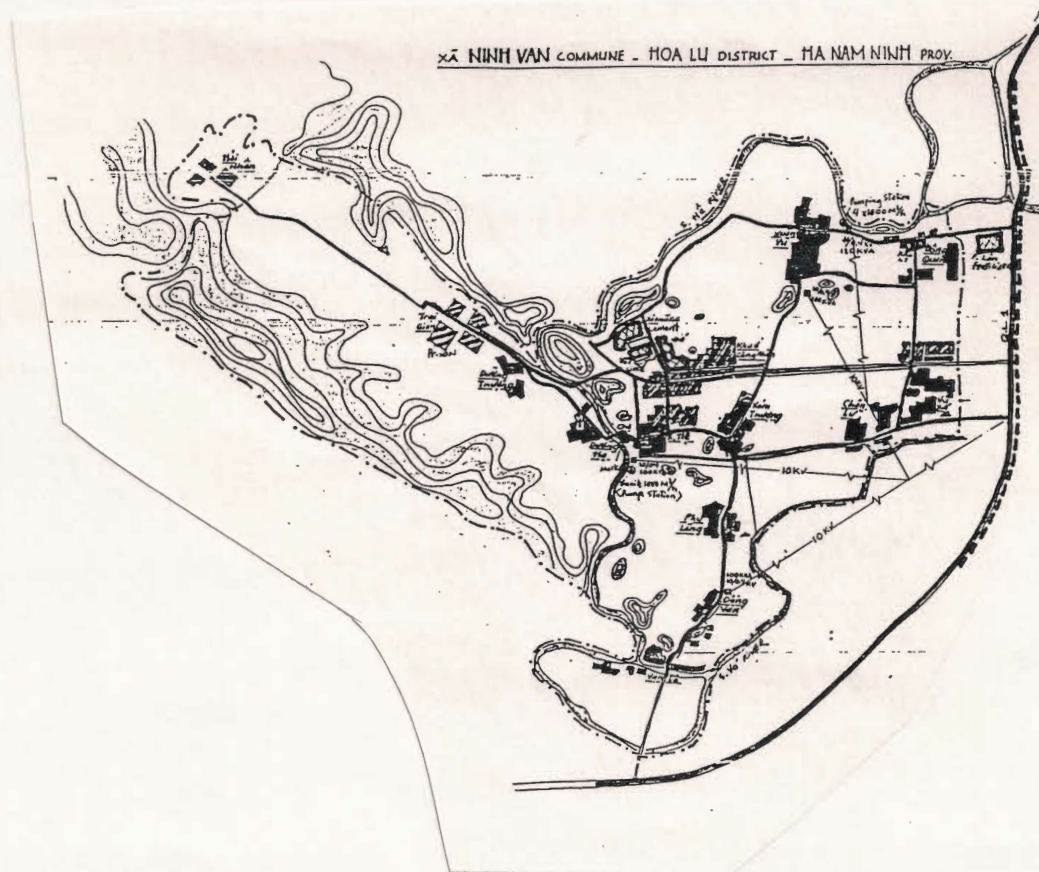
The timing for launching these activities depended essentially on how quickly CERPAD could present an accurate dossier for implementation, the degree to which the commune could then mobilize resources where these were called for, and, after the initial research and feasibility work was completed, an assessment as to whether a particular action should be implemented in the field or not.

### **Progress on action areas**

Initial research and experimentation showed that it was not viable to take certain actions to the pilot implementation stage (for example, the development of stone columns for building), and they have been stopped. A number of others have been successfully implemented, such as the Phu Lang public well and the Van Le - Tam Diep road. But the majority have progressed in a pilot stage of implementation, but have not been disseminated to a wider public, even though there are indications that they have the potential to do so. For example, prototype improvements to stone crushing equipment produced interesting and positive trial results, which suggest that CERPAD should now explore finding a manufacturer to make stronger stone crushing blades to put on the market. Another is the case for developing the small improved stoves shown in the commune, after the most recent version of the stoves sparked popular interest when shown publicly (see 3.4. Communication activities) - CERPAD should push ahead with helping put in place local production. Similarly, family size water filters have potential, but have not been pushed to the point where wider dissemination in the commune was possible, in part because the models proposed remain costly, and can thus only be afforded by well-off households.

The case of water filters is illustrative of CERPAD's persistent reticence about developing cheap and affordable solutions. Whilst encouraged by the water and sanitation expert to use cheaper and more readily available materials such as bamboo, rattan and plastic or tin (and for which specific ideas were also proposed), CERPAD

*The need for affordable solutions in the communes - trial ideas for filters at CERPAD; a filter built in Ninh Van commune*



have continued to promote quite large and expensive filters beyond the reach of medium and poorer families. A combination of promotional activities to make the public aware of the benefits of clean or at least cleaner water, and a simultaneous promotion of a simple affordable system would have made more impact on the population than has been possible with a limited number of larger filters. And one can compare this with other communes in the coastal region where one does find small filters being used even by families with very modest incomes.

Three important points stand out: the need to adapt products to the socio-economic realities of the principle target groups; the need to take ideas beyond the subsidised prototype stage; and the need to develop a communication programme to raise awareness and to show what can be done.

*Stone culvert on the Van Le - Tam Diep road, Ninh Van commune*



*Improving stone crushing machinery, Ninh Van commune*

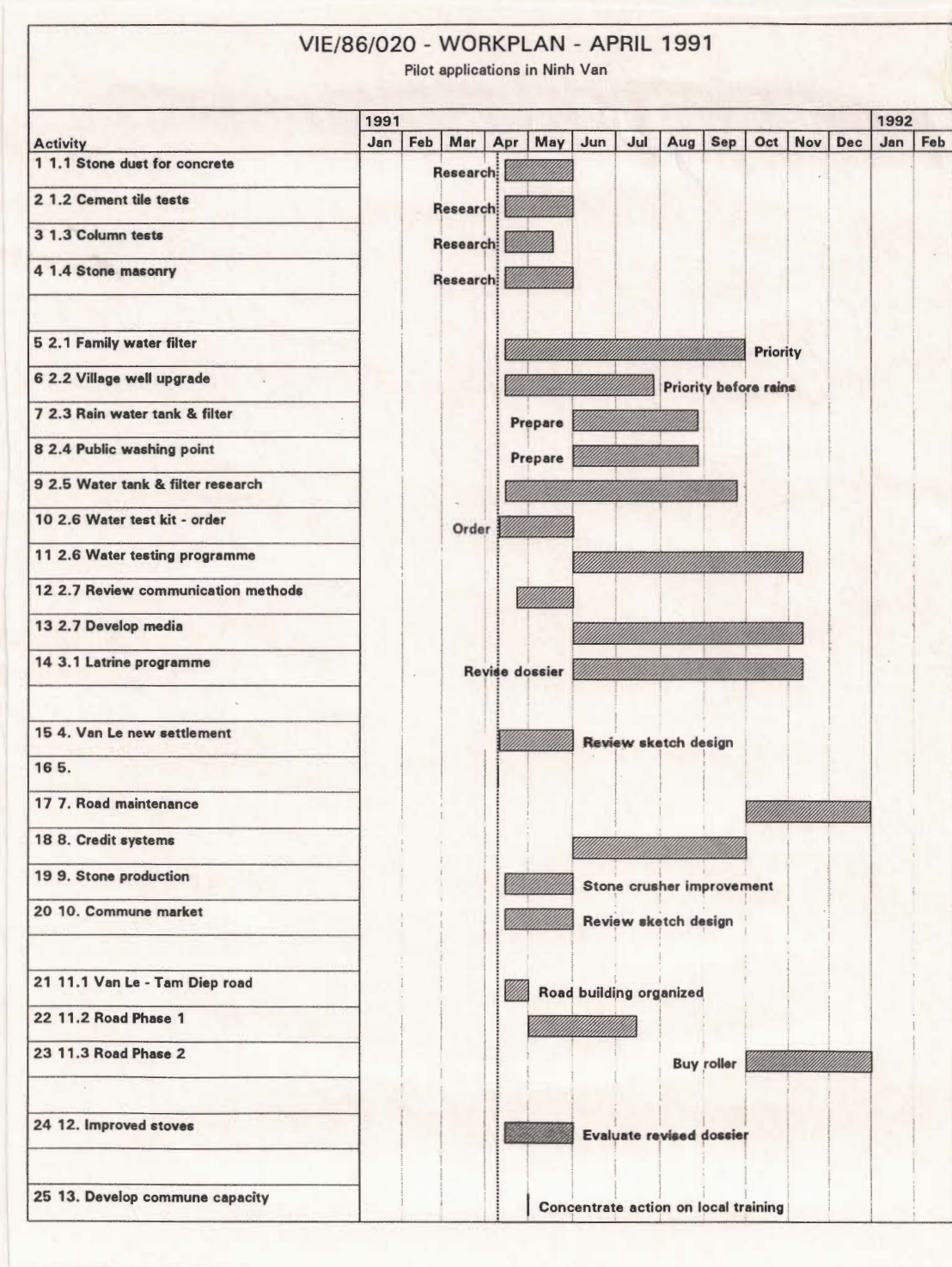


### ***Collective actions***

Capital and public infrastructure development activities, have been funded through contributions from the commune and the district (of which much in terms of labour), and with funds from the sub-contract and the main VIE/86/020 project. Actions have advanced according to the capacity of the commune to devote manpower to the programme. The Van Le Tam Diep road has been completed well; work has then started on the new market development, and the new settlement development at Van Le has been postponed.

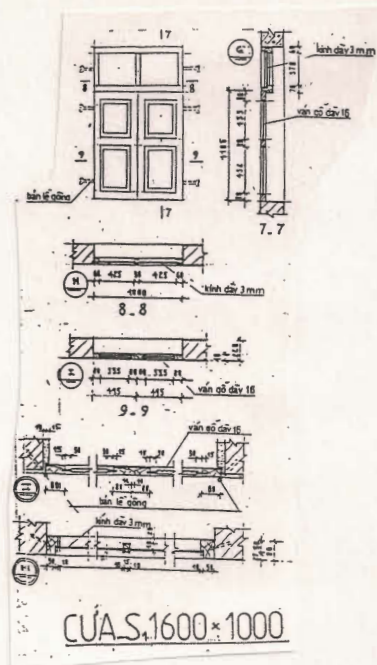
The table on the following page summarises how each action has advanced, with a commentary on potential or limitations.

### Summary of Ninh Van actions



### 3.3.2. Thang Son commune

#### Opening designs for the schools



#### Action areas

After the January 1992 workshop, six areas of action were identified:

- school building;
- upgrading 1.5 km of road;
- developing a credit system for households;
- house improvements; energy;
- water lifting mechanisms for wells.

#### School building

A dossier for the school building was developed. Careful attention to the design of openings led to some innovation - high level glass and low level opening shutters - to overcome the problem of having adequate light during cold periods and rainy weather, but at the same time avoiding having glass in low level windows which would certainly get broken. At an estimated cost of 112,960,000 Dong\*, construction work has been undertaken by the district construction enterprise, using for the most part materials which come from outside the commune, which is regrettable.

\* Average Dong value has been around 11,000 Dong for \$1 US.

As of July 1992 the building was nearly complete, but the review of work in progress in July 1992, indicates that quite a lot remained for CERPAD to do:

- calculate and evaluate the costs, in terms of origin of materials and labour, and thus value to the commune, and in terms of the overall operation.
- evaluate the innovations proposed for the windows in terms of cost, performance, durability, and the results shared with local partners;
- develop a programme for school maintenance, with the participation of the school staff.

### **Roads and culverts**

Work on road improvements and culverts had been completed by July 1992, but maintenance needed to be planned.

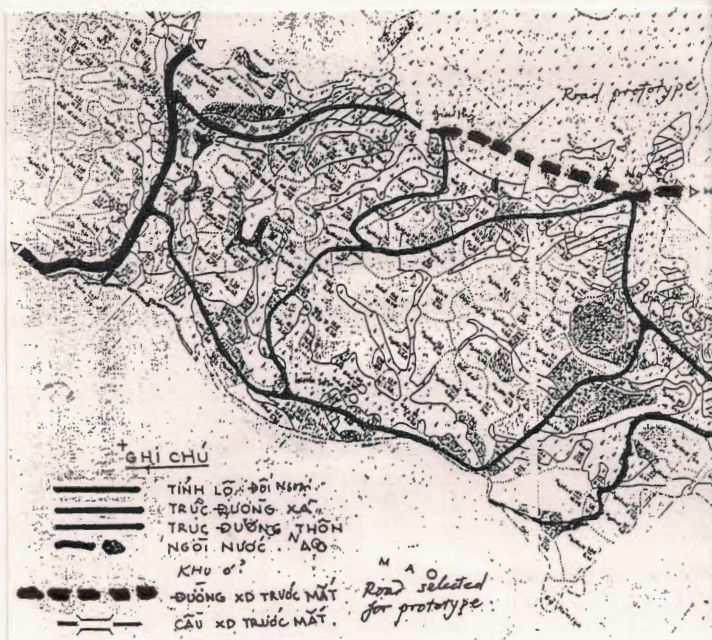
### **Credit systems**

No progress had been made on the crucial issue of credit, and this action has been postponed pending the approval of a significant project extension.

### **Water extraction**

For water extraction, CERPAD designed one prototype pulley, at an estimated cost of 30 - 40,000 Dong/unit - which is costly for the average family. By July 1992 no action had been taken to disseminate the idea, although it was suggested by the sub-contractors that 10 pulleys should be produced and distributed (perhaps through a lottery in benefit of developing school equipment or other resources), and that the ten should then be tested in use. But CERPAD also need to consider simpler and cheaper systems, and preferably ones that can be maintained locally.

*Route of the new road, and new culverts, Thang Son commune*



### 3.3.3. Xuan Vien commune

#### **Action areas**

After the workshop in January 1992 six areas of action were identified:

- school building
- small dams
- culverts
- develop a credit system for households
- housing

It was agreed that action should proceed on the school and culverts, and that an investigation would be made on the question of small dams, to be followed by action. as in the other communes, the costs of actions have been shared between the commune, the district and the provincial administration, representing here about 50% of overall costs, and the rest from the VIE/86/020 project.

#### **New school building**

Here the situation is similar to that of Thang Son commune. In July the ten classroom school was nearly finished at an estimated cost of 164,836,000 Dong. But in this case materials from the commune have mainly been used - palm tree wood for windows, cement tiles manufactured in the commune with local sand. An accurate analysis of the costs and benefits is still needed, however, as in the case of Thang Son commune.

#### **Dams and culverts**

With regard to dams and culverts, only one of each had been completed in July, work having been hampered by rain. One also regrets the lack of information and attention to the training process which would have made this essentially simple activity more replicable. Work on dams had reached the stage of a technical proposal.

#### **Credit**

No progress had been made on developing an understanding of the suitable credit systems.

### 3.3.4. Promotion of local capacities

For both Thang Son commune and Xuan Vien commune, one sees significant progress in the analysis process, both in involving the local counterparts, and in coordination between CERPAD and the local counterparts. The technical dossiers produced for both Xuan Vien and Thang Son communes were a considerable improvement on those for Ninh Van. But once action comes to the implementation stage, the tendency has again been to revert to poor monitoring of costs, and in some case quality. In implementation a low level of attention paid has been paid to training or promoting a local capacity, although there is a greater readiness to use local productive potential (workshops). But one is forced to conclude that the implementation of actions stage is still too much regarded by CERPAD primarily as a 'production' process, with little attention to the transfer of skills from CERPAD to the local community to replicate or to maintain the initiatives in question.

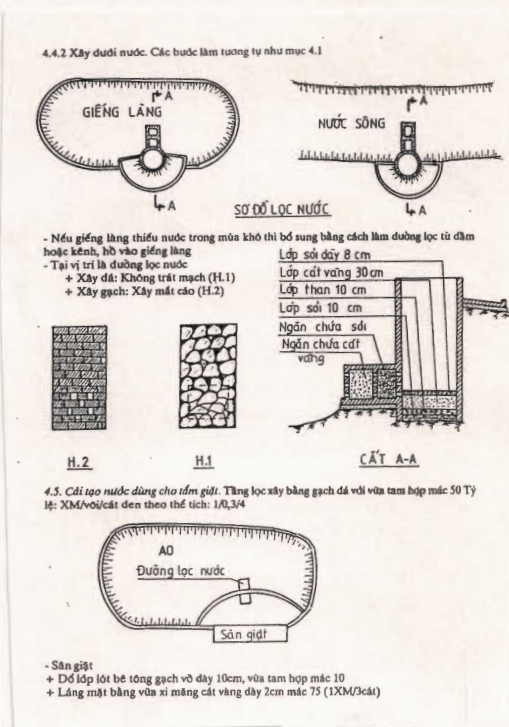
### 3.4. Phase 4. Communication

Both informing the public about CERPAD activities - both general and technical - and motivating and mobilizing the public, should form an important part of CERPAD activities. In January 1992 the sub-contractors organized a small competition amongst CERPAD staff on 'Communication'. Ten people produced suggestions, including ideas for writing popular songs, poetry, putting on plays, writing development messages on the walls of public buildings in the villages, organising study tours for the communes' Rural Development Boards to learn from each other, as well more regular suggestions for making manuals, posters, and models, and to use the local loudspeaker systems which are already used for informing the public. Between general CERPAD documentation and items which were prepared for the Ninh Van Appropriate Technology Promotion day, a number of these initiatives have been subsequently implemented, including the following:

#### Initiatives

- pilot demonstration actions in the communes;
- the organisation of seminars for senior technicians and decision makers from provincial and district level, where CERPAD have made presentations about the different elements of their programme;
- the organisation in Vinh Phu of training workshops (see 3.2. above), where the accent has been on transferring usable information and techniques to a specific audience;
- the production of short technical dossiers, for use in implementation of actions;
- the production of guide-line documents in Vietnamese on the subject of water

Extract from a guideline document - 'public wells'




supply, on improved stoves and biogas, on house construction using compacted earth, and on road building; intended primarily for provincial technicians. These documents draw, for the most part, on the same technical sheets used in the dossiers, but have a more lengthy explanatory text to accompany these ideas.

- small folded A4 sheet information handouts on improved stoves and on water filtration.


**Target groups**

The majority of these actions - seminars and publication of documents - have been targeted towards a small group of commune, district and provincial officials, whom CERPAD has seen as its prime audience, and who are undeniably important actors

**Small pamphlets on water filters and ....**



Trét một chúng tại buồng đình.  
Chỉ vì tại một vị sinh nước dùng.  
Quanh năm tắm rửa ao bùn.  
Tránh sao bệnh ông, đời vẫn anh ơi.



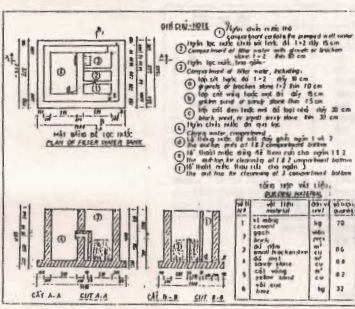
Yêu nhau xin hãy nghe lời.  
Ta xây bể lọc giống thời ta dùng.  
Lắng, đun, tắm rửa nước trong.  
Vợ con mát mắt, nhà lành, mới sung.

- Không ăn uống, tắm rửa bằng nước ao tù.

- Chỉ dùng nước giếng, nước mưa, nước đã qua lọc để loại bỏ vi trùng và các chất bẩn, dịch virus khác ngoài virus sạch sẽ đã được, quàn ăn.

- Nước qua lọc sẽ loại bỏ được hoàn toàn các căn bệnh, loại bỏ được các chất làm tổn hại sức khỏe và các vi khuẩn gây nhiễm bệnh đường ruột.

- Có thể làm bể lọc bằng nhiều hình thức khác nhau tùy theo điều kiện và khả năng của mỗi gia đình.



Một kiểu bể lọc đơn giản cho thể tự xây dựng

C

h Văn - Hoa Lu

Loại chất	Đơn vị
7,5	kg
30,0	kg
7,00	kg
1,20	kg
10	kg
12	kg

u chuẩn  
xúc động

**HÃY NHẮC NHAU  
CHỈ DÙNG NƯỚC SẠCH  
TRONG SINH HOẠT TẮM UỐNG  
TẮM RỬA HÀNG NGÀY**

Trung Tâm Phát triển Nông thôn  
UNDP-VIE/86/020

**..... 'improved stoves'**

**SƠ SÁNH KẾT QUẢ THÍ NGHIỆM**  
giữa bếp đun truyền thống và bếp đun cải tiến.

Chỉ tiêu so sánh	Loại bếp	Bếp truyền thống (bếp không)	Bếp cải tiến (bếp rơm rạ)	Bếp cải tiến (bếp củi)
Số sánh nhiệt độ buồng lửa	Trung bình lửa Ngọn lửa đang	800 - 850 C không	500 - 700 C	750 - 850 C 350 - 4
Hiệu suất của bếp so với nhiên liệu (với công suất loại nhỏ, công bằng nhau)	Lượng rơm rạ hoặc lượng Kcal Hiệu suất %	0,44 kg 800 9,4	0,22 440 18,9	0,15 375 21,1
Số sánh tốc độ tăng nhiệt độ	Thời gian 1 phút	50 c 100 200 350 500 600 700 800 850	100 200 400 600 700 800 850	100 200 400 600 700 800 850

**HÃY ĐI BẾP ĐUN VỮA ĐỒ VỮA ĐỒ KHI**

Màn hè nóng nực anh ơi.  
Em nghỉ đun bếp mở hơi rỗng rỗng.  
Lửa đun rơm củi mà hồng hồng.  
Khởi tro vùi vùi khắp cực lòng lấm thây.

Người ta đun nấu thành thói.  
Ngồi đun mà tưởng nghỉ chơi ăn nhàn.  
Bếp cải tiến lợi trăm phần.  
Xây mau anh hỡi dân nghèo nội chí.

**TRÌNH TỰ XÂY BẾP CẢI TIẾN**

Điều 1: Xây 2 hàng gạch nền nền nhà bếp kích thước (0,6m x 0,7m). Đặt một khoảng trống kích thước (0,1m x 0,27m) cho cửa lò. Đặt 1 hàng gạch cách nhau 2 cm.

Điều 2: Đặt bếp ở cửa chỉ ở phía trái trên của đơn. Xây gạch ngang qua cửa bằng một hàng gạch của tầng 1.

Điều 3: Tạo đường khói và rãnh nước theo đúng hình ảnh.

Điều 4: Xây ống khói, làm van thoát, tạo một bếp. Trải gạch nền trên bếp. Đặt van ống khói gần một bếp hoặc cửa ra vào.

**SỬ DỤNG VÀ BẢO QUẢN**

Đôi với bếp cải tiến, nên đun vào phía trên. Đặt ở trước 10 cm và 2, 3 cm trên giá đỡ giữ van ống thoát phía. Thường xuyên làm vệ sinh đường khói, sử dụng nước rửa sạch van ống thoát phía chính van thoát ống thoát phía. Tránh để nước và chất gây ô nhiễm rơi xuống.

Bếp cải tiến TK.90 dùng cho đun củi rơm, rạ.

in the rural development process, but who are not, one hopes, in the long run going to be the real ultimate beneficiaries.

In the most recent stages of the project, however, (May 1992) the sub-contract has been encouraging CERPAD to turn its attention away from informing technicians and decision makers and instead to consider what could also be done to transmit ideas and information to the local population as a whole. For example, making the general public aware of the possibilities of getting better water or more efficient stoves, ideas that had been, in the case of Ninh Van commune, introduced on a limited scale into the commune (147 subsidized stoves built). A survey carried out amongst the Ninh Van commune population at the time of the Appropriate Technology Promotion Day (see below) in Ninh Van commune in May 1992 actually showed that, with the exception of the Van Le - Tam Diep road, the population were largely unaware of the VIE/86/020 inputs. Of those who had participated on collective works for the commune, they indicated that work on the clinic and the school were the main actions, but neither of which are part of the VIE/86/020. Of the 34% of families who had built private facilities, only 2% had help from the Commune and CERPAD. (See Annexe 1 for a summary of results). At the same time, the People's Committee 'mobilisation' of the population has been largely focussed on organising labour teams to work on the large scale programmes of which road building is the most notable\*, and has not been strongly directed towards informing the public about actions they might take and the help that might be available from the the People's Committee.

### ***The Ninh Van commune Appropriate Technology Promotion Day***


As an initiative to address these issues, the sub-contractors suggested to CERPAD that they should organise a day of public promotion in Ninh Van commune on the 5th May 1992. This was seen as a pilot action which could be repeated in other communes. For the population, the intention was to put on an exhibition of actions (posters and actual demonstration of products where possible) at the site of the commune market, on the morning of market day when a maximum number of people would be present. Slogans about development were written on the walls of buildings around the commune. It was also arranged that there would be two performances of a puppet show (an independent initiative developed by DW/GRET in order to explore popular means of communicating development messages\*\*) on the themes of improving water supply and on taking preventive action against typhoons, and which CERPAD agreed could be part of the day's activities. For the population, the exhibition would also be

\* Each family has in any case to contribute a number of labour days per year to the commune and the district for collective activities.

\*\* Two plays 'Cut with the yellow scum' on the theme of water purification, and 'The defeat of the storm genie' on the theme of typhoon resistant building, based on ideas by J. Norton and G. Chantry, were written and produced by the Central House of Puppetry, Hanoi. The development and production of the plays were funded by DW/GRET, as was the first performance in Hanoi to an invited audience. The plays have subsequently been performed in Thanh Hoa province and at Ninh Van commune, with funds from UNDP and the Australian Embassy (for Thanh Hoa) and from the VIE/86/020 project in Ninh Van commune contributing to travel an performance costs in the villages. A separate report on this activity is available from DW & GRET

Poster panels produced by CERPAD for the Appropriate Technology Day

### BỂ LỌC NƯỚC GIẾNG LĂNG



**TRƯỚC KHI CÀI TẠO GIẾNG LĂNG:**  
Giếng bị xuống cấp, bờ giếng sụt lún, sau mỗi cơn mưa nước xung quanh tự chảy vào giếng. Mưa khô giếng khô cạn, nguồn nước được bổ sung vào giếng lấy từ cảnh đồng (tầm), nguồn nước này rất đục và bẩn mang theo nhiều vi trùng gây bệnh là chủ yếu, đau mắt...

**LỢI ÍCH SAU KHI CÀI TẠO GIẾNG LĂNG:**  
Nguồn nước ăn uống quanh năm. Nước trong sạch hợp vệ sinh. Lấy nước đỡ dùng bình rỗng rọc kẻo.

**BẢO QUẢN GIẾNG LĂNG:**  
Trong thôn cử người chịu trách nhiệm trông nom, sửa chữa hư hỏng.


- Thường xuyên làm vệ sinh sân giếng và các khu vực xung quanh.
- Không vứt bỏ rác rưởi xung quanh giếng.
- Cắm tấm lưới ở cạnh giếng.
- Không thả trâu, bò, lợn quanh giếng.

**CÔNG NHÂN XÂY DỰNG BỂ LỌC NƯỚC TẠI GIẾNG LĂNG PH. LẠNG**

- Tranh và đắp gầu nước vào thành giếng.

**SƠ ĐỒ CẤU TẠO HOẠT ĐỘNG CỦA BỂ LỌC NƯỚC GIẾNG**

### BỂ NƯỚC MƯA GIA ĐÌNH



**MẶT BẰNG VÀ MẶT CẮT BỂ CHỨA NƯỚC**

**BỂ CHỨA THÔNG THƯỜNG:**  
Nguồn nước mưa phong phú trong mùa mưa, tuy nhiên chứa trong gia đình có phần lọc mưa trước khi vào bể chứa nước.

Lượng nước mưa hứng trực tiếp từ mái nhà vì cho chảy vào bể chứa, vì vậy có rất nhiều chất cặn bẩn trong nước.

Bể nước mưa không có phần lọc phải thả nửa hàng năm và không tận dụng được những cơn mưa nhỏ đầu mùa.

**BỂ CHỨA CÓ PHẦN LỌC:**  
Nếu bể chứa nước mưa trong gia đình bạn xây dựng được những cơn mưa trước khi chảy vào bể chứa, bạn sẽ có nước mưa hợp vệ sinh để tận dụng được mưa đầu mùa.

**BỂ CHỨA NƯỚC MƯA CÓ PHẦN LỌC**






## HÃY DỪNG BÉP ĐUN CẢI TIẾN TK.90




shown close to the site of the puppet shows in the afternoon. For this public promotion day, CERPAD produced a very good series of panels on the Ninh Van commune programme and the activities that had been undertaken. In parallel to developing a programme aimed at the people, CERPAD also invited representatives of neighbouring communes and district technical and administrative staff, as well as some ministry representatives from Hanoi. CERPAD and the People's Committee organised for the morning a small presentation 'seminar' (speeches) and arranged a tour of visits to the new road, the public well, a water filter and an improved stove (the latter two in the same house belonging to a member of the People's committee), and during the morning session, a display of posters outside the room where the 'seminar' was held.

On reviewing the results of the day, the small display of posters and the stove at the market generated interest. Several thousand people who watched the puppet plays, and on leaving, looked at the posters which were displayed outside.

CERPAD staff, however, still tended to concentrate on looking after and showing their activities to the invited officials. Whilst this was plainly important, an opportunity had been missed by CERPAD to help the commune's Rural Development Board to use the posters and plays and to use the local loudspeaker system as the basis for achieving a more dynamic and informative contact with the population in general.

*Puppet show on improving water supply - Ninh Van Appropriate Technology Day*



# 4. Development of CERPAD facilities and services

## 4.1. Equipment & services

In parallel to developing field activities and related skills, the sub-contract called for the supply and installation of equipment and prototypes, both as actions in the field, and as a base for analysis and testing in CERPAD. At the start of the subcontract period initial equipment was provided for soil testing (see list in Annex 2.), in keeping with the terms of reference. Instructions for doing soil testing have been compiled by DW/GRET (Soil analysis notes 1 & 2\*) and essential instructions translated into Vietnamese\*\*, and reproduced with considerable care by CERPAD. In addition to equipment imported, other items have been manufactured or purchased in Hanoi, with the intention of setting up both a field-based capacity to test soils, and a more comprehensive laboratory capacity in Hanoi to complement field results with more

### Extracts from instruction documents - from English to Vietnamese

SOIL ANALYSIS FOR BUILDING 4

**STAGE TWO: Analysis in the field.**


Four tests you should do on the site give you good information about the granular composition, the stickiness of the clay, and effect of water on the soil. You can already tell how the soil can probably be used. From these results, you can decide if it is worth taking a soil sample back to your laboratory.

Write the results down on the 'soil analysis form' for each test you do.

**What you need:**  
 1 litre of water for each sample.  
 1 small mason's hammer or pick.  
 A 50cm length of round reinforcing bar, 10mm Ø, with a flat end.  
 A small bowl for mixing earth and water.  
 The soil analysis form where you record the results.


**The tests**

**Touch test with dry earth**  
 This allows you to judge which the main grain type is in the soil  
**What to do:**  
 Pick out any gravel larger than 5mm. Rub the soil with your fingers in the palm of the hand. Note what it feels like.



**Results:**  
 Soil is grainy and coarse? Sandy Soil  
 Soil is powdery and quite fine? Silty Soil  
 Soil is smooth, sticks together, hard to crush? Soil with much clay

**Touch test with damp earth**  
 This allows you to assess the stickiness of the earth, and therefore see how much clay there is.  
**What to do:**  
 Take some crushed earth from the soil you are testing. Pick out any gravel larger than 5mm. In the mixing bowl, add water and mix into a paste. Rub the soil with your fingers in the palm of the hand. Note what it feels like.



**Results:**  
 The mixture does not stick to your hands; The mixture does not stick together: Sandy Soil  
 The mixture sticks to your hands a bit; The mixture quickly separates into grains: Silty Soil  
 The mixture sticks a lot to your hands; The mixture remains as a paste: Soil with much clay.

không được chính xác. Các hoạt động thông thường của dụng cụ là: chốt dính của mũi nhọn trong khoảng bờ nhỏ của đất sinh ra 2 vòng cung của khoảng bờ nhỏ trượt tại mặt của cốc đất. Trong thí nghiệm xu hướng là đối với đất trượt trở lại trên cùng một mặt thay thế cho việc rơi xuống. Điều này là không xảy ra bởi vì rãnh tròn không thể thực hiện được, đất không có độ dẻo và nó được ghi nhận rằng giới hạn lỏng không thể xác định.

**Chú thích 9:** Một số đất có xu hướng trượt trên mặt cốc thay thế cho đóng chặt. Nếu xảy ra việc trên thì kết quả sẽ bị loại bỏ và thí nghiệm phải lập lại cho đến khi đóng chặt xảy ra. Nếu sau khi bổ xung thêm nước, mặt trượt vẫn xảy ra thì thí nghiệm không thể áp dụng được, và phải ghi nhận rằng thí nghiệm lỏng không thể xác định.

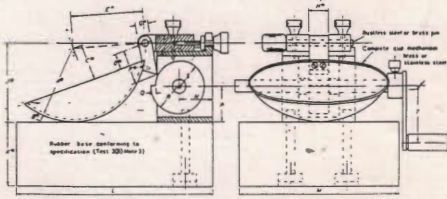
**Chú thích 10:** Đối khi đất chảy xuống thành miếng dẹt đoạn giữa 2 điểm tiếp xúc. Thí nghiệm sẽ được tiếp tục cho đến khi đạt được chiều dài liên tục là 13mm.

**Chú thích 11:** Việc bảo quản sẽ được thực hiện sao cho những mẫu không được quá khô giữa 2 thí nghiệm lập lại; số lượng của nó để kết thúc sẽ tăng dần dần khi mẫu thí nghiệm khô đi.

**Kích thước.**

Ký tự	A	B	C	D	E	F	G
mm	54	2	27	12.5	56	25	10
	+0.5	+0.5	+0.5	+0.5	+0.5	+0.5	+0.5

Ký tự	J	K	L	M	N	P	Q	R	S	T	
mm	16	60	30	150	130	27	28	6	22	19	45
	+0.5	+0.5	+0.5								



Thiết kế này là thỏa đáng, những thiết kế lựa chọn có thể giành cho người sử dụng sao cho những yêu cầu đặc biệt được thỏa mãn đầy đủ (Kích thước đặc biệt được đánh dấu bằng dấu sao).

Hình 5. Thiết bị giới hạn lỏng Caragrande.

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- \* Soil analysis note 1 under the title 'Soil analysis for Building' focussing on field testing procedures (produced in 1989 by J. Norton & GRET); and 'Soil analysis notes 2', focussing on 'Laboratory testing procedures for soil'
- \*\* 'Tieu Chuan Ang - Nhung Quy Trinh Thi Nghiem Dat

sophisticated tests. It was recommended that the technician in charge of building materials, Mrs Nha, should be joined by an assistant who would be trained and operate the laboratory, although this has not happened by the end of the sub-contract inputs.

### ***Water testing laboratory***

In March 1991, a sub-contract specialist input for water supply and sanitation worked with the CERPAD water and sanitation technician to identify the materials needed for a mobile water testing capacity. As a result a mobile water testing kit was supplied (see list in Annex 2. ). Three members of the CERPAD team went on a training course on the use of the kit, and during the course also developed an additional list of equipment to be imported or in some cases bought in Hanoi, that would enable them to set up a fixed laboratory in Hanoi at the CERPAD site. Instructions for using the equipment were also translated from English into Vietnamese. \*

### ***Delays in setting up the laboratories***

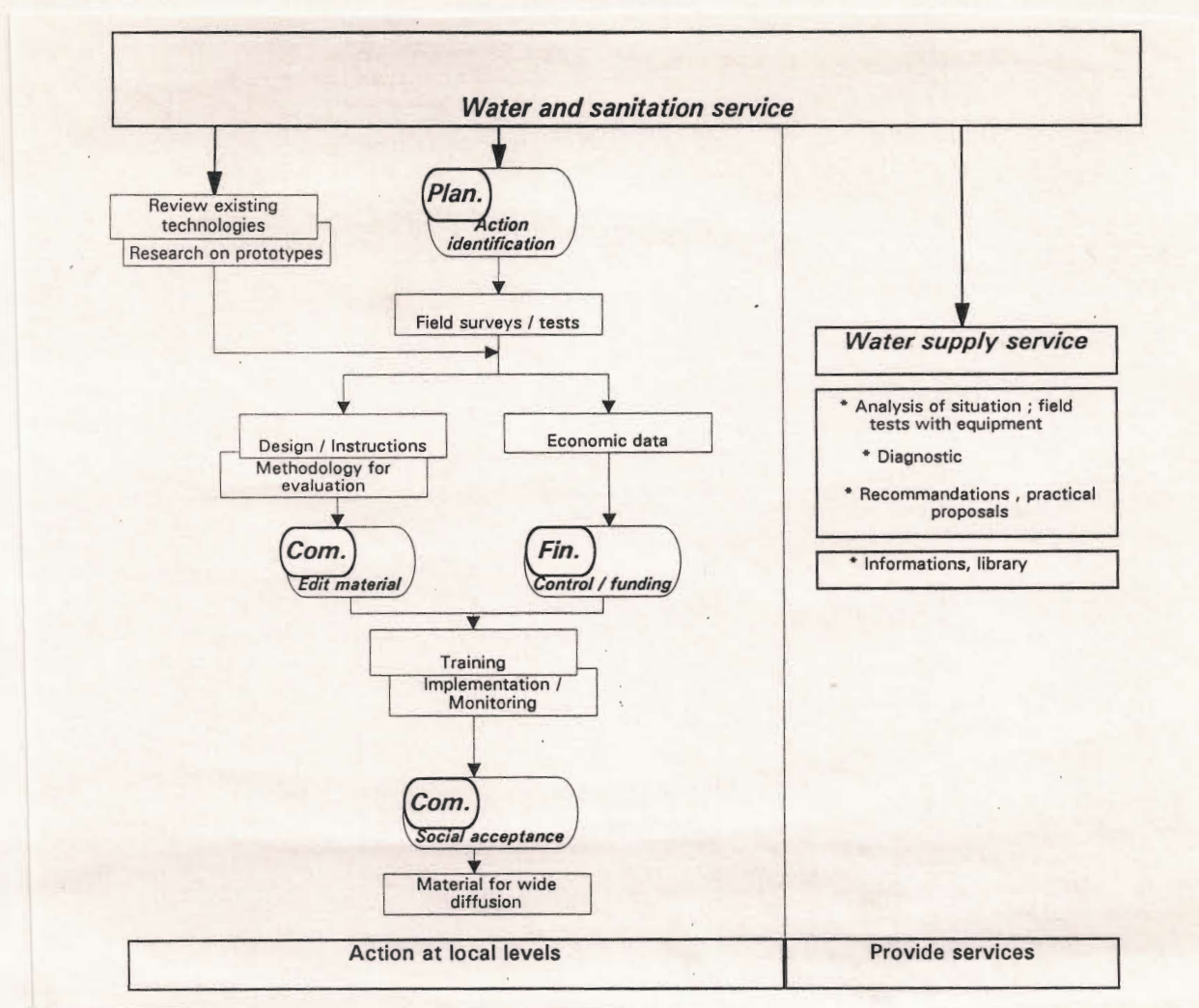
Unfortunately, however, the process of setting up the laboratories has been seriously delayed by the absence of any space being available for accommodating and using the equipment. The only space at the time which could have been used belonged to CATTIC, who were not participating in the project, and who have not helped in making space available to CERPAD. Thus soil testing equipment shipped to Hanoi in October 1990 remained in its cartons until 1992. Laboratory space has in effect only become available in the period from May to July 1992, at the very end of the project period of sub-contract inputs, and thus leaving no time for the proper commissioning of the laboratories. In July 1992, DW/GRET were able to report that for the water testing laboratory a room has been allocated and prepared, and at last equipment has been unpacked and installed. For the soil testing laboratory there was still indecision about rooms, and a temporary room has been allocated in which the equipment has been placed. At the request of CERPAD, a technical dossier for the manufacture of a double action manual soil-block-making press has been provided. However, the viability of producing compressed earth blocks has not been proved, neither from the point of view of cost nor social organization - and as such the sub-contract has not considered that the purchase of a press from abroad was justified.

### ***Use of equipment***

In both cases, the serious delays that have been encountered in providing conditions in which equipment could be used has meant that the sub-contract has not been able to certify that all the equipment is being used correctly by CERPAD staff, although it is reasonable to consider that both the building materials specialist and the water supply specialist have sufficient information in the translated handbooks to be able to continue with tests.

\* Talleu huong dan su dung bo phan tich mau nuoc LOVIBOND 2000

## Structure for the Water and Sanitation Service



More importantly, CERPAD still needs to develop these two activities into properly presented services, as outlined in the joint project assessment prepared by DW/GRET and Eric Whist\* and as mentioned in section 2.5. The diagramme shown on the opposite page presents the structure for the Water and Sanitation Service, and a similar structure has been proposed for Soil testing. This in part means preparing publicity for the service, but it also means establishing a price tariff for services if, in particular for water testing, CERPAD is going to be able to replace chemicals and products as they get used up.

### Outstanding equipment requests

At the end of the sub-contract period of inputs, the sum of US \$38,485 remained available for equipment purchases and associated activities. Seriously formulated

\* See: 'A joint project assessment' Development Workshop & GRET, and Eric Whist, October 1991

suggestions for the purchase of equipment that might support a well defined programme related to the realities of energy needs in the communes where the project has been working had not been prepared by CERPAD by the time that sub-contract inputs ended, and this despite requests and guidance (including commentaries on earlier proposals) as to how well prepared proposals should be formulated (see technical dossiers). Requests for the purchase of equipment to be used in (or on) CERPAD's office - such as installing solar energy panels on the office roof - were received, in the form of a list of items, on the last day of the sub-contract formal inputs in May 1992, and with no plan put forward as to how this material would be used in the context of the VIE/86/020 sub-contract programme. Yet the principle has been stressed by the sub-contractors that, in just the same way that actions in the communes have needed to be carefully prepared in order to be sure that the population are being given the best advice, so too this same principle needs to be applied to the identification of items to be supplied to the project, in order to ensure that the means and resources were available to keep the equipment in use, and in order to ensure that the equipment would directly contribute to CERPAD's programme of helping people in the rural communes. Unfortunately, this principle does not seem to have been readily accepted, and in October 1992 CERPAD again submitted the same list of items for purchase abroad without any substantiation. At the request of UNCHS (Habitat) the sub-contractors proceeded in obtaining quotes, which in the event greatly exceed the available budget. This served to underline the need for detailed proposals with priorities, *established in the light of a review of the technical, social and financial viability of each proposed technology or action*. In the case where either commune or household demand and / or investment do not justify the effort and money on a proposed technology, then either such a technology does not merit having equipment purchased for it at this stage in the programme of CERPAD, or the economic and social problems should be resolved before any major investment is made. At the time of writing, CERPAD has presented a reduced list of items to be purchased either abroad or in Hanoi, with an order of priority on each item. For those items coming from abroad, the sub-contractors have proceeded with their purchase.

## 4.2. Training

Each mission that has been undertaken by the sub-contract has been treated as an interactive training process, involving working with the CERPAD staff, reviewing progress, developing the next phase of activities and the supporting materials - survey sheets or programmes - and in going over the technical dossiers that have been under development. In the early stages of the sub-contract programme, general training and discussion sessions were held with the majority of the CERPAD staff present, and provided the opportunity to go over the basic principles and methods being used in the programme. Later on, work has tended to be in smaller groups, dealing with specific issues, and often working on the improvement of technical dossiers. From the start of the Vinh Phu phase of activities, the emphasis has moved to making CERPAD adopt a similar training process with their counterparts in the communes and districts, and this process appears to have worked successfully at the level of survey and analysis technique transfer.

## 5. Expectations, achievements and shortfalls

Putting in place the methodology and implementing the actions that have been identified have, by and large, taken longer than might have been expected. A number of actions remain incomplete. It is therefore probably premature to evaluate the impact of the project. At the same time it would also be unrealistic to consider that the ambitious targets of the project could have been achieved in a lasting manner in two years, and it is thus essential to consider the development of the VIE/86/020 objectives as an ongoing and long term process. A great deal has been achieved, but it is also certain that much more effort and progress will be needed if value is to be obtained from the time, ideas and energy that have already been invested, and if CERPAD operations and working philosophy are to be taken through to a point where CERPAD can fulfil a really useful function in developing rural Vietnam *with realistically available resources and sustainable rural skills*.

Despite this proviso on evaluation, at the end of two years work with the Centre, DW/GRET feel that one should highlight some negative and positive points, from which to go forward.

Overall, the methodology that has been promoted in the programme appears to be well understood and used, covering survey techniques, identification, and the selection of actions. CERPAD have increasingly demonstrated a good ability to coordinate operations between the CERPAD staff, the communes and the districts. There has been major progress in involving the 'Rural Development Board' in the commune, and through it, in mobilizing commune funds and resources, which have in some instances represented a major investment on behalf of the population and the Commune. In the design of actions or projects, there has begun to be increased sensitivity to local potential and needs, and there has begun to be an effort to find innovations which are more closely tuned to the capacity and resources of the commune, and perhaps, less dependant on external funding for household level actions. Implementation in the field has been timely, thanks in part to the efficiency of the contractors employed on the building tasks, but also thanks to the capacity and the efficiency of the People's Committee's ability to mobilize labour.

But some weaknesses remain. Of these, the first is the poor ability of CERPAD to monitor the quality and the accurate cost of operations, and revue them against initial criteria and projections. There have been too many examples where, at the end of pilot actions there is still insufficiently accurate data on how much an action has "cost" in terms of money, materials and human input, and thus to what extent it could be replicated or even improved upon. Secondly, this weakness in monitoring has in turn over the whole duration of the programme reflected a low degree of readiness to consider the process necessary for the diffusion of ideas to the end users and process of achieving the sustained production and use of proposed improvements. This weakness can be seen at the level of equipping the Rural Development Board with the

materials and media to help them in help the population, and in promoting actions which can be undertaken by householders or small producers, and in the case of the latter, which can go on being produced after CERPAD have left the commune. In effect CERPAD staff have, particularly in the case of Ninh Van commune, remained too directly involved in implementation focussed on achieving a product (or a finite number of items constructed), and *insufficiently focussed on putting in place a process*. This, on the one hand, means that CERPAD's capacity to undertake actions remains limited because they have not learnt to delegate sufficiently. On the other hand it also means that they have not made a major shift towards developing skills amongst commune and district counterparts for design, implementation, and, when needed, training people to help in domestic improvement activities and to operate as a support system to the population. There have been a few exceptions, which hopefully show the way forward - for example, the initiative to train local producers for cement and stone dust tile production - but it would seem to have been largely a question of lack of incentive that stopped CERPAD from developing local production of improved stoves in Ninh Van.

Overall a major task for CERPAD is to create the environment within which its staff have the incentive to go out and spend the time needed to train their counterparts, to do so with carefully prepared training materials, for which the technical dossiers have been intended as a base, and to do so with the intention that products can be maintained locally and where possible reproduced locally.

Sustainability and replicability are words that have been used often in this report, as they were in the original sub-contract technical proposal. They have been used frequently over the two years of the sub-contract input, and considered as essential criteria if a technology for rural development is to be truly appropriate. And yet at times it has appeared that CERPAD's perception of the objectives of the project have not clearly included replicability and sustainability as important objectives in the choice and implementation of their actions. This has undeniably been both a cause of concern in the implementation of the sub-contract, and a cause of friction in relations between the different parties. And yet as international resources become scarcer it becomes ever more important that those resources which can be channelled into development of rural vietnam should be used to achieve results that are as sustainable as possible.

To conclude, if at times progress has seemed difficult, there has nevertheless been significant advancement over the period since October 1990, in quality of work and in the approach to work in the rural communes. But a great deal remains to be done before CERPAD can fully play the role of a centre transferring capacity to the rural areas so that they can undertake and sustain actions with a limited amount of support. And to do this, there needs to be a continued rigourous attention to detail in the development of CERPAD proposals, so that the information that is transferred to the rural areas is in the best interest of the communes and of the best quality.



## Part 2. Outputs against project objectives

The subcontract bid proposal on which the contract was awarded, outlined the approach, methodology and the phases which would be followed in order to meet the objectives of the sub-contract as stated in the ToR paragraph 2.2.1.

This section reviews the four phases (see section 3 in Part 1 of this document) alongside the four types of activities listed in the ToR section 2.2.2.

In the left hand column actions which were proposed in order to fulfil the ToR requirements. In the right hand column, a summary presents how these have been

The outputs called for in the ToR, (text taken from the Sub-contract Technical Proposal).

1 Type of activity (a) /  
Task T.1.

The proposal recommended a "bottom-up" approach where the demand comes from the commune; the TCATC (CATTIC) and (important in the future) the local technology support centres, are able to respond to this demand.

Analysis of demand and feasibility are essential to this process, and so too is the process of ongoing evaluation to make sure that social appropriation is taking place or to know why not. The proposal responds to the first ToR type of activity ("research and development activities") by supplying in Phase 1 the methodology for identification and evaluation.

The outputs achieved under the auspices of the sub-contract

**Note:** The TCATC (CATTIC) did not participate directly in the VIE/86/020 sub-contract. CERPAD has had to assume the role which was envisaged for CATTIC, with a different staff profile.

The methodology for analysis, identification and ongoing evaluation has been introduced in a series of steps.

Firstly, elements of the methodology were introduced to CERPAD staff during the evaluation of actions in the three Group A communes (see Part 1 for details and indication of relevant reports).

Secondly, the process was then continued with CERPAD staff whilst undertaking analysis and identification work in Ninh Van commune.

Through the application of this methodology, technologies and/or actions will be identified, thus fulfilling Task T.1 ("Identification of Appropriate Technologies for Rural Development"). Phase 2 will see the development of skills related to these technologies or actions.

## 2 Type of activity (b) / Tasks T2 and T3

Supply of equipment (ToR activity (b): "Supply and installation of equipment activities") will be broken down into three supply stages, linked to the evolution of the programme.

### *Supply stage 1*

Phase 1 will include supply of those items which are necessary for the Phase 1 activities, i.e. equipment for evaluation of technologies already introduced; and equipment for analysis of resources and environmental conditions. Thus the ToR Task T3 ("Installation of a building materials testing capacity within the TCATC") are partly covered under this stage.

Thirdly, the process was strengthened when the same analysis and identification techniques were subsequently used by CERPAD in training the commune and district counterpart staff in Vinh Phu province, in the communes of Xuan Vien and Thang Son.

Based on the analysis and identification process, actions have been identified in each Group B commune, with criteria to determine choice and monitor results. In this way appropriate actions for rural development have been identified. These actions respond to real needs in the communes.

The equipment has been supplied in three phases.

(i) initial equipment supplied at the start of the subcontract inputs (see list in Annexe..) For soil testing space was not available in CERPAD for setting up equipment. This has delayed installation until July 1992, after the end of the formal sub-contract inputs. An extra mission was undertaken in July 1992 by DW/GRET to check that installation had taken place. The same problem has applied to the subsequent supply of water testing equipment for use in a laboratory.

### Supply stage 2

This covers subsequent materials and products analysis and testing equipment which will be supplied in Phase 2 activities and which will be directly related to techniques and materials identified as a result of Phase 1 activities. This therefore completes the requirements of Task T3

### Supply stage 3

This consists of - inter alia - the supply of equipment/prototypes which, *at the end of the Phase 1 activities*, are identified as being necessary for the improvement, introduction or production of innovative ideas. This phase thus meets the requirements of Task T2 ("Research and development of Appropriate Technologies in Construction within the TCATC").

## 3 Type of activity (c) / Task T4

In the ToR, "Training activities" (Type of activity (c)) focus on the use of pre-identified technologies. (See Task T4: "Training of TCATC staff in the use and implementation of Appropriate Technologies for Rural Development and in Building Materials Testing".)

Training must be extended to cover not only the use and testing of technologies identified in the course of the programme, but also fundamental training in socio-economic and technical

(ii) Additional equipment has been supplied throughout the duration of the subcontract in accordance with *identified* needs. This has notably included supplying water testing equipment and additional soil testing equipment. (see list in Annexe.2 ). User manuals and guides have been compiled in English and translated into Vietnamese for both soil analysis and water testing.

(iii) As actions have been identified, the equipment budget line in the sub-contract has been used to cover costs of training (ie training for stone dust tile production; training sessions for commune and district staff in Vinh Phu); for prototype experimentation (ie. stone crushing equipment improvements; development of stone culverts under roads; stone column tests); and purchases of an innovative nature, such as the tractor with solid wheels for road rolling in Ninh Van commune. A list is given in Annexe 2. At the end of the sub-contract period funds remained for equipment supply, and could be used subject to CERPAD submitting viable equipment requests within the budget limits. (see 4.2 for further comment.)

Training has been an integrated activity throughout the programme, based on the introduction of methods or ideas, on providing assistance and guidance in applying them, and in evaluating and upgrading the results, in particular with regard to precision.

Training has included detailed work on socio-economic analysis and water supply and quality analysis (see ex-

analysis and evaluation techniques and in skills for communication and exchange of information.

#### 4 Type of activity (d) / Tasks T1 - T4

The requirement for "development support communications activities" (type of activity (d)) is met as follows. Appropriate supporting training and communication material will be prepared at each phase. These materials will be designed to suit the different target groups of the programme and will include:

- use in training of TCATC staff in all activities (including training of trainers);
- for use by field workers;
- and for communication activities with and amongst the populations of communes.

amples in all Group B communes shown in Part 1 of this report). The subcontract has also guided CERPAD undertake training of commune and district counterparts. In the latter stages of the subcontract inputs CERPAD has been encouraged to produce posters and other media for the Ninh Van Appropriate Technology Promotion day. The subcontractors worked with CERPAD staff to decide how to organize and the promotion day and develop ideas for communication.

The development of technical dossiers for each action has encouraged CERPAD staff to explore in detail the technical and social context of each idea, the cost, and the process of each action whether involving technology (such as using stone) or a matter of organization and finance (such as developing the Ninh Van commune market, or in operating the Ninh Van commune tractor on a sustainable economic base).

Under the auspices of the subcontract, the following dossier and communication materials have been produced:

- the production of short technical dossiers, for use in implementation of actions;
- the production of guide-line documents in Vietnamese on the subject of water supply, on improved stoves and biogas, on house construction using earth, and on road building; intended primarily for provincial technicians. These documents draw, for the most part, on the same technical sheets used

*'Communication activities' continued...*

In addition to specific reference works, the sub-contract will supply broad AT documentation in the form of (a) an "Appropriate Technology Microfiche Library" which includes the complete text of 1000 documents published on AT and (b) 780 technical leaflets produced by GRET.

in the dossiers, but have a more lengthy explanatory text to accompany these ideas.

- small folded A4 sheet information handouts on improved stoves and on water filtration.
- posters on the complete range of CERPAD actions undertaken in Ninh Van commune

Communication activities have also covered:

- pilot demonstration actions in the communes;
- the organisation of seminars for senior technicians and decision makers from provincial and district level, where CERPAD have made presentations about the different elements of their programme;
- the organisation in Vinh Phu of training workshops (see Part I section 3.2. above), where the accent has been on transferring usable information and techniques to a specific audience;
- The organisation of the Ninh Van Appropriate Technology Promotion Day.

A micro fiche reader and fiches has been supplied giving information from 1000 documents, and a further 780 technical information sheets have been supplied from GRET. Documents and books have also been supplied on other specific subjects (see list in Annexe 2) but space in CERPAD has been needed for their proper display and easy access by all staff members.

## 5 Priority technological areas

The ToR listed three "priority technological areas ... retained for consideration by the sub-contract ... based on previous work done by the IURP and the TCATC" (ToR ref: 2.2.3).

In addressing these issues, the proposal advocates that not only is it essential to develop a sound base of working methodology, but also that the starting point is to evaluate the actions carried out so far in the Group A communes. This will enable the creation of a sound structure to the programme. This process of evaluation also serves to illustrate the need for the development of a methodology, rather than the supply of a product in the first stage.

Priorities on technologies have been identified as a result of the commune needs and resource analysis work. The list of actions that have been worked on cover:

- water and sanitation;
- improved stoves (with a focus on improving social affordability and distribution ideas);
- road building and maintenance, and the development of culverts using arches;
- stone construction;
- earth construction analysis and review of technical choices;
- social infrastructure development (schools);
- water conservation (dams)
- income generation ideas including improving stone crushing equipment, developing the market, and initial exploration on credit systems;
- settlement planning;
- development of the commune Rural Development Board capacities.

The subcontract began with an evaluation of the three Group A communes, and joint reports were produced by CERPAD and DW/GRET on each commune. The subcontract has devoted considerable time to developing the organisational structure of CERPAD and the definition of the roles to be played by the various departments that it should contain, with the intention that CERPAD should be better placed to fulfil its mandate in the future.

# Annex 1. Summary of results on the survey carried out on Ninh Van Appropriate Technology Day.

## Ninh Van A.T. Promotion Day

Questionnaire : Global information (100)

### I/ Participation to collective works for the Commune :

- Yes : 30 % (Mainly in Xuan Vu for Clinic, school)
- No : 70 %

### II/ Private facilities built by families :

- Yes : 34 % (2 % with support of Commune/CERPAD)
- No : 66 %

Amount of money : From 000 to 1.000.000 Dong

### III/ Participation to events with CERPAD :

- Yes : 13 % (Mainly in Van Le; 7/25 families)
- No : 87 %

### IV/ Changes in the Commune in the last 2 years :

- Yes : 71 %
- No : 29 %

#### - Main changes :

- \* living conditions, agriculture, public facilities, electricity;
- \* road improvement, market (for 30%)

### Brief conclusion

- a/ except for the Van Le Road, CERPAD is not wellknown by the N.V population ;
- b/ the families improved their private environment with no support, or help, from the Commune;
- c/ for the majority of the population, the changes in the Commune do not correspond to CERPAD activities ;

DW-GRET May 1992

# Annex 2. List of equipment and documents supplied by the sub-contract.

## A. DOCUMENTATION CENTRE

Note: Manufacturer's instruction booklets for laboratory testing equipment supplied are listed with the relevant equipment.

### ***A1. Appropriate Technology micro-fiche library, with micro-fiche reader***

1,700 microfiches (1,000 books), publ. by Volunteers in Asia

### ***A2. Technical pamphlets***

800 technical pamphlets published by GRET, reproduced from numerous specialist sources.

### ***A3. Books and other documents related to building materials***

Building with Earth. A Handbook, John Norton, Intermediate Technology Publications, 1986, 62pp.

Earth Construction Primer, Volume 1, CRATerre.

Soil Analysis for building, John Norton, GRET (Rexcoop), 1989, 21pp.

Equipment for compressed block production, John Norton, GRET (Rexcoop), 1989, 21pp.

Using CEB in building houses, John Norton, GRET (Rexcoop), 1989, 21pp.

Is there any future for burnt clay cottage industries, J. Gué, CSV/GRET, 106pp.

Dossier "Presses à briques", M. Marciano, GRET, 1985, 45pp.

Briques et Tuiles, B. Mestiviers, Dossier no.6, GRET, 1985, 47pp.

Compressed earth block plant in Ethiopia. S. Jaffrelo, GRET, 1988, 70pp.

Laboratory programme on Soil/Technical reports, T. Des Lauriers, GRET (MUDH/Rexcoop), 1984, 247pp.

British Standard Methods of Test for Soils for Civil Engineering Purposes, BS publication no. 1377.

Social Acceptability of Earth Technology, Catherine Becdelièvre & Isabelle de Boisnenu, GRET/MUDH, 1990, 36pp.

Soil block presses/Product Information, Gate.

Bloc de terre comprimée, ACP-CEE.

Raw earth construction: French equipment, CRATerre, 79p

Técnicas mixtas de construcción con tierra, CRATerre, 152p

Rural roads and poverty alleviation, J. HOwe, I.T. Publications, 1984, 190pp.

Guidelines for the development of small-scale construction enterprises, ILO, 1987, 135pp.

#### ***A4. Books and other documents relating to energy***

Les éoliennes de Pompage: Théories, matériels et réalisations, GRET,

Proceedings of International Biogas Conference, GATE.

Le dossier du BIOGAZ (C: Equipements périphériques et maintenance; D: Stratégies de développement/Etudes de cas), GRET

Maîtrise de l'énergie dans les pays sahéliens, BLACT/CFECTI/GRET.

Energy balances, CEE, 1986, 362pp.

#### ***A5. Books and other documents relating to water and sanitation***

Water Treatment and Sanitation, H.T. Mann & D. Williamson, Intermediate Technology Publications, 3rd ed, 1982, 96pp.

Community Water Development, ed. Charles Kerr, 1989, 112pp.

Small Scale Sanitation, Richard Feachem & Sandy Cairncross, Ross Bulletin no.8, January 1988, publ. by the Ross Institute of Tropical Hygiene, 53pp.

Small Water Supplies, Sandy Cairncross & Richard Feachem, Ross Bulletin no.10, January 1986, publ. by the Ross Institute of Tropical Hygiene, 78pp.

Human wastes: health aspects of their use in agriculture and aquaculture. IRC WD News, May 1988, No 24, 31pp.

Evaluation for village water supply planning, WHO-IRCCWS, 1984, 179pp.

Guidelines for drinking water quality, vol. 13: Drinking water quality control in small community supplies, WHO, 1985, 120pp.

Slow sand filtration, WHO, 1974, 122pp.

#### ***A6. Books and other documents relating to issues of appropriation/communication***

Social Appropriation of Indigenous Building Materials, MRE-CD/FAC/GRET, 1985, 40pp.

Vers une diffusion de l'Innovation Technologique dans le Logement Populaire: l'expérience d'Acapulco (Mexique), Joel Audefroy & Yves Cabannes, GRET Habitat, 1988.

Technologies Appropriées & Communication, Special ed. of Réseaux, July 1984, publ. by GRET.

Identification et Evaluation des Moyens de Diffusion de l'Innovation Technologique dans le secteur du logement à faible coût dans les pays en voie de développement, GRET-Habitat, 1986, 124pp.

Proceedings of the Inter-Caribbean Workshop on Low-Cost Housing, Dominica, 1984, 127pp.

La experimencia de diffusion de las cases de madera, Mexico, GRET-FONHAPO.

Proceedings of Communitex '87 conference, Embrater/GRET.

### ***A7. Books and other documents relating to issues of evaluation/participation***

Listen to the People, Laurence F. Salmen, Cambera, 1988, 46pp.

Participatory Research, an Introduction, Society for Participatory Research in Asia, 1982, 46pp.

Fiches pour la pratique de l'autoévaluation animée, R. Willot, CRID, 1984.

S'évaluer. Formation à l'autoévaluation, R. Willot, "Echos du COTA" 1988, 16pp.

Evaluation of Housing Programmes: Summary of Data Sheets for Documentation of Case Studies, Yves Cabannes & Dorothea Schonning, GRET-Habitat, 1984, 24pp.

A System for Monitoring and Evaluation of Appropriate Technology Projects, E. Hyman & T. Corl, Appropriate Technology International, 1985.

Gender Roles in Development Projects. A Case Book, eds. C. Overholt, M. Anderson, K. and Austin Cloud, Kumarian Press, 1985.

Human Factors in Project Work, H/ Perrett & F. Lethem, World Bank Staff Working Paper no. 397, 1980.

The cost-effectiveness analysis field manual, R. Nathan & Assoc., PACT (New York), 1986.

Fiches de données pour les études de cas, GRET-Habitat.

Approaches to participation in rural development, ILO.

## **B. LABORATORY AND FIELD TESTING EQUIPMENT AND ACTIVITIES**

### Notes:

1. At the time of writing (January 1993) items marked [\*] have been authorized for purchase. Where these are being supplied from overseas, orders have been placed for delivery direct to Hanoi.
2. All installation and transport costs have been covered by the sub-contract equipment budget, as has translation into Vietnamese of instruction manuals.
3. Additional small standard pieces of laboratory equipment, (test tubes etc.), purchased locally, are not separately listed.

**B1. Equipment for building materials testing****- supplied from overseas:**

Casagrande apparatus

soil testing sieve 100 mm dia (for dry sieving), with 7 mesh sizes (20 mm, 10 mm, 5 mm, 2 mm, 0.5 mm, 0.2 mm, 0.08 mm) and base.

soil testing sieve 200 mm dia (for dry sieving) with 10 mesh sizes (25 mm, 16 mm, 10 mm, 5 mm, 3.15 mm, 2 mm, 1 mm, 0.5 mm, 0.2 mm, 0.08 mm) and base.

soil testing sieve 200 mm dia (for wet sieving) with 6 mesh sizes (10 mm, 5 mm, 2 mm, 0.5 mm, 0.2 mm, 0.08 mm), base with drain, and lid for washing.

shaker

density metre 1000-1050g/l

penetrometer 0 - 150 bars

sclerometer

cone penetrometer [\*]

automatic controller [\*]

**- purchased or made in Hanoi:**

oven

thermometer

clear plastic tube

scales 1 gm - 10 kg

scales 0.1 gm - 2 kg

stopwatch

spatula

pans and metal dishes, some with lids

knife

hammer

pestle and mortar

metal scoop

polished stone surface (for ribbon test)

tray

hot plate

water supply and sink, with fittings, incl. installation

grooving tool for use with Casagrande apparatus

mould and bracket for cohesion test

shrink box

compaction test mould and tamper  
hydraulic press, incl. installation [\*]  
3 moulds 150 x 150 150 [\*]  
3 moulds 150 x 150 x 100 [\*]  
2 soil block presses [\*]  
3 moulds for rammed earth [\*]  
additional miscellaneous small items

## ***B2. Equipment for water testing***

### ***- supplied from overseas:***

£ 2,984.00 - "Paqualab" incubator, incl. filtration unit, 25 Aq petri dishes, connecting cables and field manual and instructions for use

digital pH/temperature/mV meter, complete with electrodes, operating manual and carrying case

chloride test kit (for approx, 40 tests)

"Paqualab" photometer, complete with 6 test tubes, dilution tube, operating manual and carrying case

iron LR reagent system 0-1.0 mg/l sufficient for 50 tests

total water hardness kit, low range, 0-50 mg/l, (tablet count method) with case, instructions and tablets for 100 tests

nitrate reagent system 0-1.0 mg/l ("Palintest" comparator disk) sufficient for 50 tests, with test instructions

nitrate reagent system 0-0.5 mg/l ("Palintest" comparator disk) sufficient for 50 tests, with test instructions

ammonia reagent system 0-1.0 mg/l sufficient for 50 tests

irrigation test kit

reagent pack

turbidity tube 5-500, with test procedure and guidelines on interpretation of results

£ 370.75 - 500 gms lauryl sulphate broth (Slanetz and Bartley) medium

1000 adsorbent pads and grid membranes

2 chlorine HR reagent packs [\*]

phosphate reagent pack [\*]

sulphate reagent pack [\*]

2 chlorine reagent packs [\*]

2 manganese reagent packs [\*]

2 reagent packs [\*]

2 reagent packs [\*]

2 irrigation test kits [\*]

digital PH meter [\*]  
2 laboratory dissolved oxygen meters [\*]

**- purchased or made in Hanoi:**

furnace (1000c) [\*]  
binocular microscope [\*]  
analytical digital balance [\*]  
oven (200c) [\*]  
dehumidifier [\*]  
electric stabilizer [\*]  
wet/dry bulb hygrometer [\*]  
additional miscellaneous small items

**B3. Equipment for energy testing**

**- supplied from overseas:**

2 bench mounted thermometers without probe [\*]  
2 surface probes [\*]  
digital vane anemometer [\*]  
digital thermo anemometer [\*]  
2 multipurpose meters [\*]

**made or purchased in Hanoi:**

4 improved stove moulds [\*]  
heat value tester [\*]

**B4. Equipment for road maintenance/improvement**

tractor MTZ 50 (locally purchased)

## C. PILOT APPLICATIONS/TRAINING/COMMUNICATION ACTIVITIES

Note: These are detailed in the main body of the report. Listed below are key headings merely to give an indication of the nature of the activities covered by the sub-contract equipment budget-line. The sub-contract funded practical work where it involved testing, innovation or training.

### **C1. Ninh Van (communes B1)**

actions - see report (these included funding tests on stone dust tiles and training; funding for improving stone crushing equipment; funding for tests on the use of stone for wall and column building; for the building of road culverts; funding for tests on substituting sand with stone dust in making cement or mortar (tests done with the Hanoi Institute of Building materials); etc.

promotion of appropriate technology, incl. exhibition of prototypes and the preparation of posters, and the costs of meals and facilities for the Ninh Van AT day.

part contribution to puppet show performance (on theme of water purification). The commissioning of the puppet show, the majority of the Ninh Van performance costs, and other performances - including in Hanoi - have been funded from other sources, and notably by DW & GRET.

further actions (1.1, 1.2, 1.4, 2.6, 9) - see reports on pilot applications

### **C2. Vinh Phu (communes B2 and B3)**

prototype pulley systems

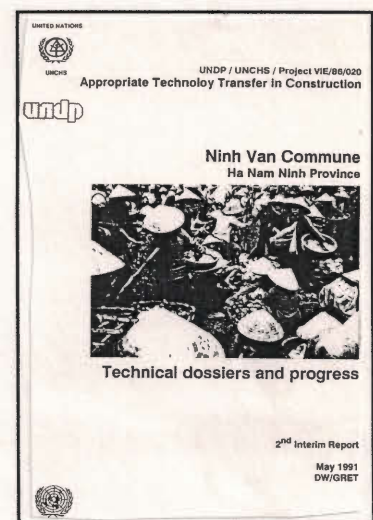
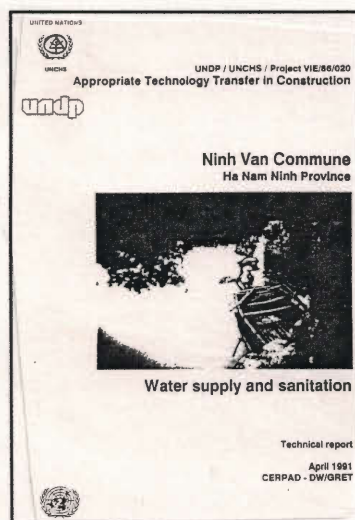
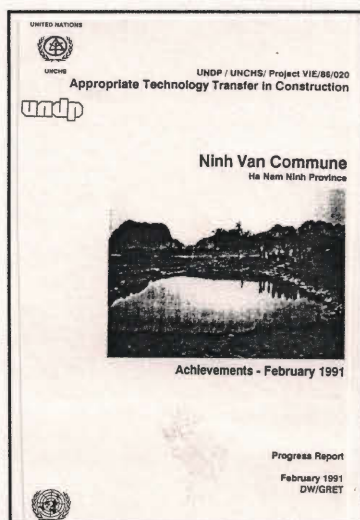
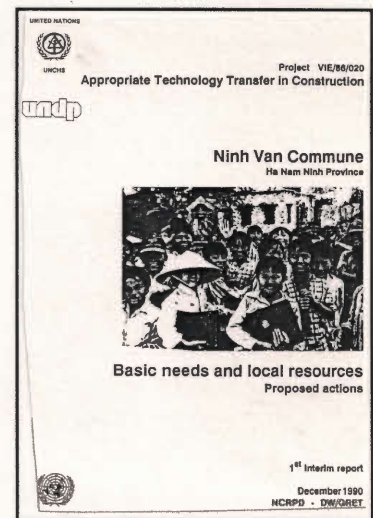
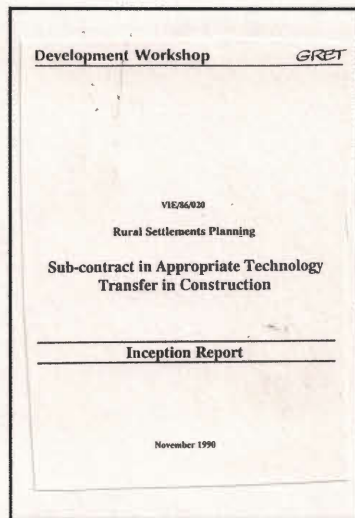
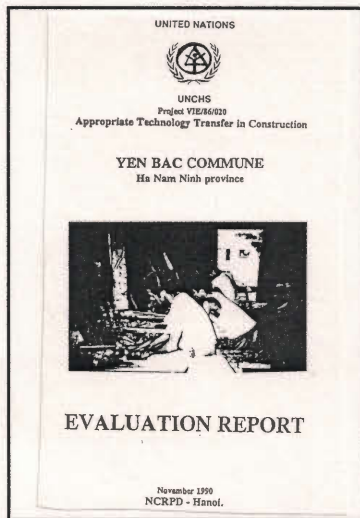
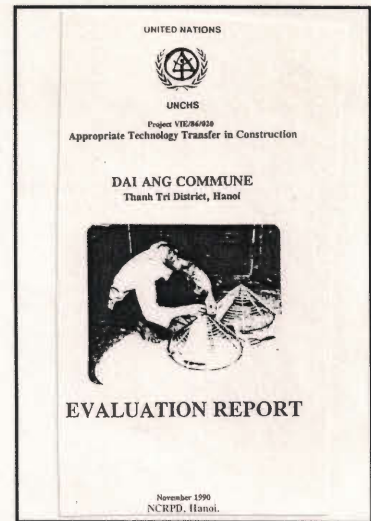
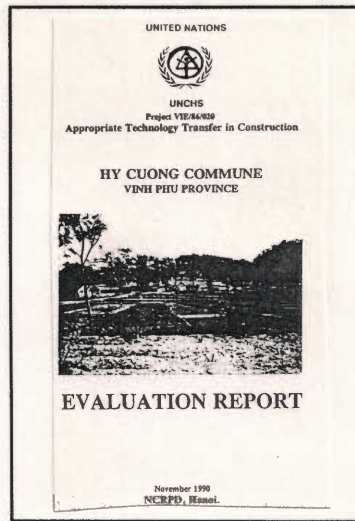
2nd training workshop (local fees/per diems/translation etc.)

action 1 - see report

### **C3. Hanoi**

water testing course


# Annex 3. Reports produced during the project.



Ninh Van pilot actions June 1991

UNDP/UNCHS CERPAD

Technical dossiers




Development Workshop Center for Rural Planning and Development Hanoi/Vietnam GRET

UNDP/UNCHS/ Project VIE/86/020

Appropriate Technology Transfer in Construction

undp

Training course for Vinh Phu local staff.



Progress Report


October 1991 DW/GRET

UNDP/UNCHS/ Project VIE/86/020

Appropriate Technology Transfer in Construction

undp

A turning point: Progress in Ninh Van Commune Starting in Vinh Phu communes



3rd Interim Report

October 1991 DW/GRET

UNDP/UNCHS/ Project VIE/86/020

undp

A joint project assessment

October 1991


Development Workshop & GRET, and Erik Whist

UNDP/UNCHS/ Project VIE/86/020

Appropriate Technology Transfer in Construction

undp

Second training course for Vinh Phu local staff.



Progress Report


January 1992 DW/GRET & CERPAD

UNDP/UNCHS/ Project VIE/86/020

Appropriate Technology Transfer in Construction

undp

Ninh Van Commune Ha Nam Ninh Province



Status - January 92


Progress report January 92 DW/GRET & CERPAD

UNDP/UNCHS/Project VIE/86/020

Assistance to Human Settlements Planning & Development in Rural Areas

undp

Structure and functions - CERPAD 1992/93



Programme Development Report

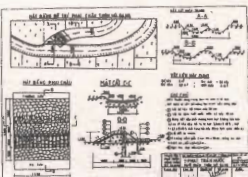
January 1992 DW/GRET - CERPAD

UNDP / UNCHS / Project VIE/86/020

Appropriate Technology Transfer in Construction

undp

Vinh Phu Province



Review of work in Progress July 1992

CERPAD - DW/GRET

UNDP/UNCHS/ Project VIE/86/020

Assistance to Human Settlements Planning & Development in Rural Areas

Soil Analysis Notes, 2

Laboratory testing procedures for soil

DW/GRET - CERPAD

# Annex 4. Key note paper on Technology Transfer, Training Workshop, Ha Nam Ninh province.

The term "appropriate technology" has been increasingly used over the last 20 years. But what does it mean? It implies that there are a range or type of technologies which are in themselves "appropriate" and that by their very nature these can be used widely to solve problems.

Unfortunately, this is not so. An "appropriate technology", usable anywhere, does not exist, and because of this many "appropriate technology" projects around the world have failed. This is because they have not managed to resolve identified and locally perceived problems in a locally acceptable and sustainable way. They fail mainly because they cannot continue to be used once external support from a centre or agency, (for operating costs, subsidies, technical support and maintenance,) is withdrawn. These are all factors which have to be taken into account if sustainability is to be achieved. And in Viet Nam - with millions of rural poor - replicability and sustainability with minimal financial support is essential. Otherwise, costs are prohibitive.

Nevertheless, for any given situation, any sort of technology might be appropriate; it might be "high" technology or traditional technology, provided it corresponds realistically to the available resources, human, material or financial, of the target group that is being aimed at, and provided it corresponds to the social and cultural reality of the people concerned. Above all, it must correspond to identified and perceived needs. There are thus certain criteria which must be followed for a technology to be truly "appropriate":

- it must correspond to an identified need, which is also locally perceived;
- it must use locally available resources;
- it must be socially and culturally acceptable;
- it must be replicable and sustainable without external support.

The people best placed to assess these criteria and the future users - the "target group". Thus the process of developing and transferring appropriate technologies is - must be - a joint process, involving the population and those, such as CERPAD and yourselves, who are trying to help them.

This help is important. Organizations such as CERPAD have a key role to play in analyzing a given problem, in making sure that a proposed solution is in reality a *solution*, and that it meets the criteria given earlier.

For in effect, the role of technicians is to ensure that a new idea or improvement is in reality cost effective and affordable, and provides the people with something better than they had before.

And it is ultimately our conscience which must make sure that people are not encouraged to adopt technologies which in the end will leave them worse off than they are now. There are, in other countries, too many examples where this has happened.

So, what exactly is technology transfer?

It means taking an idea - which might be a process or a technology - which has been identified as responding to the criteria mentioned above, and *transferring* it to the people who are in reality and over a long time going to use it and do the work.

Transfer means making sure that the target group have the information, tools, organization, and finance necessary for the technology to be appropriate, to work and to be replicable.

Who are we aiming at?

The main target group is identified as those living in rural areas, and yet we can divide most communes into at least three groups:

- the wealthy, those who have a good surplus
- a middle range, people with little or no surplus
- and the poor, people who typically receive a food subsidy each year.

When working to improve conditions in rural communes, it is the wealthy and the middle range whom it is easier to help, and at whom "appropriate technology" projects are most easily directed.

The poor are far harder to help, and thus it is important to recognize two things:

1) the inability of the very poor to save money or obtain credit is a key factor which stops them from benefitting from "improvements" and which therefore contributes directly to keeping them poor.

For example - because you can't afford to buy durable building materials, you have to replace parts of your house every year, or every two years. After several years, you will have spent as much money on short life materials as you would have done on durable ones, but you have not improved your home at all.

2) Because the poor can seldom afford good quality durable solutions to their problems, it is often important to consider proposing intermediary solutions which are perhaps less durable or which perform less well, but which allow a gradual improvement of conditions over several years.

A key factor in both cases is that economy and finance are critical, more so in fact than "technology".

This is important. One should not consider technology on its own. A successful transfer and application of a technology is combined in every case with questions and concerns about FINANCE and ORGANIZATION. A technology transfer programme which does not address these three things together - *technology, finance, and organization* - will invariably run into difficulty.