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# Appropriate Technology Transfer in Construction



Assistance to Human Settlements Planning and Development Areas

## Ninh Van Commune

Ha Nam Ninh Province



### Achievements - February 1991

Progress Report

February 1991  
DW/GRET



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# **1. Summary: progress on the VIE/86/020 project sub-contract.**

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## **1.1. Programming.**

Following a thorough selection process, a new province, Vinh Phu (north of Hanoi) has been chosen by the NCRPD. This province will provide the opportunity to develop planning and development activities. General data collection is now underway and will be processed using a Vietnamese computerized system (POP MAP). The choice of two more pilot Communes (B2 and B3) and subsequent choice of pilot development activities will be made only after some months - probably in September/October 1991. Pilot activities can only be selected in the light of specific demand (from the Commune) and according to the criteria which emerge from preliminary studies, all of which will take time. Thus the selection of pilot activities will coincide approximately with the end of the planned sub-contract programmed activities - and therefore according to current programming the sub-contractors DW/GRET will not be able to develop activities in these communes (B2 and B3) beyond the first resource and needs identification phase. The experience gained from the Ninh Van Commune programme is thus of paramount importance in developing the NCRPD team's capacity to develop viable and replicable actions in other communes in the future. The programming will be reviewed in March, when progress in the new province will make it easier to see how best to use the sub-contract inputs.

## **1.2. Staffing.**

Following the first sub-contractor mission in Vietnam\* the sub-contractors recommended that NCRPD staff for Ninh Van be reinforced with specialists in specific fields: this has in part been achieved, with - for example - NCRPD providing a mechanic and an architect for Ninh Van, and the addition of an economist (not previously working for NCRPD).

## **1.3. Logistics.**

As project activities now become more extensive, it is increasingly important that organizational problems which might otherwise hamper progress should be urgently addressed: these include translation and typing of short reports, better internal communication and - as has already been requested - adequate working space for the Ninh Van team and the sub-contractors.

\* See 'Inception Report, November 1990' and '1st Interim Report, Ninh Van Commune, Basic needs and local resources: proposed actions, December 1990'.

#### 1.4. Local staff per-diems.

As has already been discussed with the VIE/86/020 project CTA, Bob Hardy, the sub-contractors recommend that the members of the team involved in the field survey, evaluation, and training activities should receive the per diem payment according to UNDP procedures when they are not in Hanoi.

## 2. Ninh Van activities.

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### 2.1.

Following the initial identification mission, twelve 'Actions' were proposed in order to address some of the basic problems of Ninh Van commune, whilst making use of the locally available resources. NCRPD began their research/action work as planned after the Identification missions (Norton and Chantry, November and December 1990). After some 6 weeks the Ninh Van team have undertaken a significant amount of work and, in general, achieved good results.

The rate of progress has varied according to the nature of each 'action'. In some cases the research/action phase will continue for several more months; in others work will now be entering the phase of physical application.

### 2.2.

So far, attention should be drawn to the excellent relations which have been established by the NCRPD staff, and in particular through the efforts of its Coordinator/Chief Planner, with the local authorities and local social organizations. A 'Steering Committee' for Ninh Van's development has been set up, chaired by the Chairman of the People's Committee. It's twelve members include representatives of the mass organizations and the local social services. This Steering Committee has already embarked on its role of mobilizing all local potential for development. In addition, cooperation with the District authorities is good.

This should be regarded as a major achievement on the part of NCRPD staff, and one which is essential to the success of the proposed 'Actions' and their continuation in the future.

### 2.3.

At this stage, in the light of work undertaken so far, some information about Ninh Van commune needs to be revised, as follows:

2.3.1 In Ninh Van commune the new settlement of Hai Nhan (Action 4) forms part of a 'New Economic Zone', organized at Provincial level and implemented by the District, but with a very small budget. This 'New Economic Zone' is split between Ninh Van Commune and the adjacent Ninh Hai Commune. In addition, in this same part of Ninh Van Commune (i.e. the eastern area), the prison is reclaiming new land in order to extend its work activities.

2.3.2 With regard to road construction (Actions 5,7,11), the labour force required is likely to be available before the rainy season (i.e. March-May). Previously it had appeared that labour would not have been available till after the rains, and this change will make programming easier for road building.

2.3.3 Most of the villages are now connected to the electricity network. Householders pay a sum of 7000 Dong per light to the Commune, who in turn pass this on to the electricity company.

*Ninh Van research actions achievement 5/2/1991*

N	Action (%)	10	20	30	40	50	60	70	80	90	100	
1	Housing improvement	[Progress bar from 10% to 45%]										
2	Water filter tank	[Progress bar from 10% to 45%]										
3	Latrines	[Progress bar from 10% to 25%]										
4	New settlement planning	[Progress bar from 10% to 25%]										
5	Road Hai Nhan	[Progress bar from 10% to 45%]										
6	Village well	[Progress bar from 10% to 35%]										
7	Roads maintenance systeme	[Progress bar from 10% to 25%]										
8	Credit system	[Progress bar from 10% to 10%]										
9	Stone production	[Progress bar from 10% to 15%]										
10	Commune market	[Progress bar from 10% to 35%]										
11	Road Van Le-Tam Diep	[Progress bar from 10% to 45%]										
12	Local capacity in Rural Dev.	[Progress bar from 10% to 25%]										

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### 3. The main results of the Ninh Van team work to date - 'Actions' 1-12.

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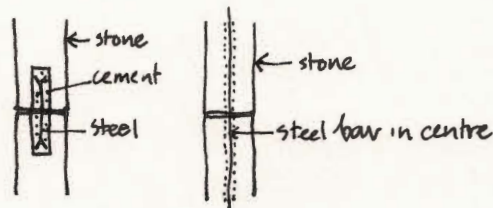
#### 3.1 Housing improvement (Action 1)

Although some preliminary information has been gathered on housing, more input is required from NCRPD, both in the field and in the office. However Action 10 (Market development) will enable practical building experimentation to be undertaken in Ninh Van.

For 'Action' 1, the team needs to continue with technical and economic studies on stone masonry, roof coverings, openings and floors.

The team should undertake the following experiments:

- \* **Flooring:** compare various ideas - cement screed, cement tiles, earth and lime - with dust stone/lime/cinder waste used in Ninh Van.
- \* **Windows:** develop screens using nylon mesh on bamboo frame (as in the small house near the market).
- \* **Stone building:** - a trial wall should be built with dressed stone for the market, as in Dinh village.
  - for columns made with single cylindrical or rectangular stone blocks piled one on top of another, the joints need to be examined and revised to make them stronger.



- \* **Roof:**
  - research into cement tiles (made with local cement, stone dust etc.)
  - investigate possibility of fixing tiles to roof frame with a hole and wire, for improved typhoon resistance.

*Comparison of techniques for roofing in Ninh Van*

Roof structure Roof covering	Wood Red tiles	Wood Cement tiles	Wood/bamboo Cement tiles	Concrete	Shells	Bamboo Thatch	Wood/bamboo Fibro-cement
Description							
<b>Technology</b>							
* Durability							
* Waterproof							
* Cyclone resistance							
* Maintenance/Repair							
<b>Construction</b>							
* Skill required							
* Transport of materials							
* Equipment							
* Labour quantity							
<b>Cost (by m<sup>2</sup>/fl.)</b>							
* Local b.mat.							
* Imported b.mat.							
* Skilled labour							
* Unskilled labour							
* Others							
* Total							
<b>Social</b>							
* Acceptance							

### 3.2. Water supply and sanitation (Actions 2,3,6)

A significant amount of work has been achieved in this field:

- \* The quality of water in different areas has been classified (e.g. quality of water in village wells). Findings show that in village wells the iron content is high and therefore treatment is needed.
- \* Water consumption rates have been calculated according to the seasons when they are used: for the rain water tank, average consumption is 10 litres per day per person during the four months of the dry season. The cost for a 10m<sup>3</sup> tank able to supply this water is in the order of 465,000 dongs.

Similar calculations have been done for a small water filter and tank.

- \* Two proposals have been made for village well water filtration: 1. Slow sand filtration; 2. Pump and filter tank.
- \* Cost estimates for latrines have been made (pour flush toilet) - 160,000 dongs/unit.
- \* A questionnaire for families about their actual situation, their needs and resources has been prepared and data gathering completed by the 5/2/91.

Action that needs to be undertaken:

- \* **Data Collection.** Process the data collected (with NCRPD computer software) and present the results for each village and the overall commune, as well as for each family. Prepare maps for water supply, water quality, sanitation, etc. Evaluate the results in order to choose the location of pilot applications.
- \* **Village well (Action 6).** - compare the different locations and conditions, and select two sites for trials: a potential site is Xuan Vu - needing an evaluation of the water supply and consumption, and needing a washing and bathing facility near the well to be designed and built. The families here are ready to contribute money for the construction of this facility, in the order of 5,000 to 10,000 dongs per family. A second potential site is at Phu Lan, where the old well needs repair to the stone walls and to the access and washing areas.
- \* **Rain water tank (Action 2).**
  - Compare the existing situation (e.g. average volumes per family) with proposed NCRPD design, and work to reduce the cost of the proposed design in order to achieve wider affordability.
  - Investigate small appliances which could be used to improve hygiene, sanitation and water supply, such as showers with fine spray head.
- \* **Latrines (Action 3).**
  - Develop methods for publicizing the proposed designs; work with local social organizations to prepare a public information campaign.

\* **General:** - for the beginning of March 1991, all documents, notes and reports should be completed in Vietnamese and English.

- Identify with local organizations the sites for pilot applications.

### 3.3. Road construction/maintenance (Actions 5,7,11) - Stone production (Action 9).

**Main results (as of 5th February):**

\* **Pre - feasibility studies for the construction of two roads completed, with preliminary indications about the use/demand for each road;**

a) Van Le - Tam Diep (Southern part).

Cost = 103 dongs per linear metre (1st priority).

b) Prison - Hai Nhan (Eastern part).

Cost = 90 dong per linear metre (2nd priority).

\* **First analysis completed of equipment available in Vietnam for road constructions (rollers, etc.)**

\* **Study completed of the stone production in the commune and actual needs (equipment, management, etc.)**

**Work to be done:**

\* **Technical study:** complete the review for the Van Le - Tam Diep road, and give precise figures on:

- road profiles (earth, stone, gravel, etc..).

- cost of building materials.

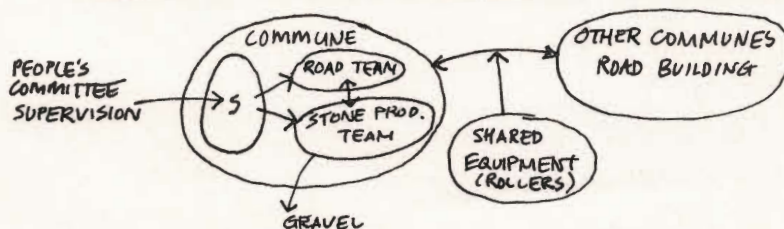
- labour force.

- programming of work in phases.

- organization and training of supervisors.

\* **Equipment:** finish comparing different machines (rollers, stone crushers, etc), and work out the exact running costs.

\* **Organize the road construction process, and raise funds for road building.**



### 3.4. New settlement planning. (Action 4).

As indicated above, the Hai Nhan area is part of an economic zone controlled by the district authority. As a result the following actions are now proposed:

- review the existing plans for Hai Nhan formulated by the provincial and district authorities.
- study the development of settlements in the southern part of the commune (Van Le village) and make recommendations.

In particular, research should be undertaken into the following:

- the size of plots, according to types of newly settled family activities, with an analysis of required plot size related to different functions.
- a review of public facility requirements, for economic, social and cultural activities.
- a review of the organization and allocation of plots according to socio-economic group; identify the minimum required infrastructure; develop basic standards for link roads and streets in the villages according to types of access and traffic; develop standards for services.

### 3.5. Village/Commune market (Action 10).

Results by February:

Preliminary design for a new market for 60 vendors has been developed. This has included:

- planning of revised access (road), re-organization of the physical environment, and development of relations with the trade co-operative;
- organize the participation of vendors, in the form of financial contributions from 50 000 to 100,000 dong each. For this action, the cost estimate is between 12 million to 15 million dong.

Work to be undertaken:

- \* complete the market design with:
  - river access - water supply system (for washing down the whole area, for the coffee shop, and for the latrines).
  - design of the new buildings to incorporate typhoon resistant reinforcement (attention to joints, bracing in roof, tying down of tiles, shutters, etc.)
- \* Carry out technical experiments on:
  - stone columns and masonry.

- improved floor finishes including locally manufactured cement tiles.

**\* Estimate total costs for:**

- site preparation (levelling, new roads, etc.).
- construction of selling stalls.
- services (e.g. water, latrines).
- improvement and repair of the trade co-operative building.

**\* Propose cost contribution breakdown between:**

- the users.
- the commune.
- the project (using sub-contract equipment funds).

**\* Make proposal for increase in taxes for market operation.**

**\* Organize:**

- skilled workers for stone construction.
- general construction teams.
- planning of works.

Related to Action 1, the village market should represent a major pilot application for developing the local stone building technology, and for improving and demonstrating ideas for services (latrines, water supply, etc.).

### **3.6. Credit system (Action 8).**

There is as yet no activity in this field; yet it constitutes to the main problem for developing small scale stone production enterprises.

To progress on this important issue, the NCRPD team should get in contact with existing Vietnamese institutions involved in rural economic development, and investigate existing local credit systems to see how they can be developed or improved.

### **3.7. Local capacity (Action 12).**

An integral part of the other activities. NCRPD development of working links with local organizations and the establishment of the steering committee are good starting points in developing the local management capacity.

## **4. General remarks.**

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There is a need to reinforce the co-ordination of the Ninh Van Team, and develop 'in-house' communication (translation, typing, etc.).

## **5. Next sub-contract missions.**

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- \* Water supply and sanitation - a specialist from a sub - contractor team coming in March (P.J.Meynell, see terms of reference, mission dates 2 - 23/03/91).
- \* DW/GRET core team missions (J.Norton and G.Chantry, mission dates 16/03/91 - 16/04/91), to:
  - monitor NCRPD activities and progress, and work on pilot applications in Ninh Van.
  - work on developing material for training and public information (manuals, posters, other media).
  - work on Ha Nam Ninh seminars, see below.

## **6. Organization of seminars in the Ha Nam Ninh Province (End of March).**

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A 10 day regional seminar for central Vietnam Provinces, and, specifically, a two day workshop in Ha Nam Ninh province on Appropriate Technology Transfer in Construction.

\* Themes:

- Identification of needs/local resources for basic, rural infrastructure development.
- Choice of technology.
- Process of implementing an " action plan " at provincial level.

\* Participants - technicians at a provincial level

- decision makers

\* Programming:

- general sessions
- working groups on case study
- field visits.

### Pilot applications in Ninh Van



Village well in Phu Lan



Village Market site



Road between Van Le and Tam Diep (southern end).

## **7. Equipment budget.**

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**A provisional budget of \$900 (us) has been provided by the sub-contractor for the start of field tests of prototype actions, for which all expenses have to be justified by invoices.**

**Hanoi, 6th February 1991**

**G. Chantry**

**on behalf of**

**Development Workshop/GRET**

**Sub - Contractors VIE/86/020.**

**Ninh Van pilot applications budget 1991**

N	Action	Pilot applications			Bud get				TOTAL (US \$)
		Unit	Amount	Total (Dongs)	Users	Commune	District	Project	
1	Housing improvement								
2	Water filter tank								
3	Latrines								
4	New settlement planning								
5	Road Hai Nhan								
6	Village well								
7	Roads maintenance systeme								
8	Credit system								
9	Stone production								
10	Commune market								
11	Road Van Le-Tam Diep								
12	Local capacity in Rural Dev.								
<b>OTAL</b>									

## **Annex : Terms of reference for extra specialist support in water supply and sanitation.**

### Context

The aim of the The Appropriate Technology Transfer in Construction programme is to develop the capacity of the NCRPD to identify the needs of communes in the field of "rural development", to perfect suitable technologies (from the technological, economic and social points of view), to test and evaluate applications in situ, to disseminate the results obtained through appropriate media.

Work has now started in the pilot commune of Ninh Van (on the edge of the Red River delta). Initial surveys to identify problems, needs and resources have indicated that, amongst other things, there is a significant water problem, both in obtaining 'clean' water for various uses, and in waste water disposal. As part of the project data has begun to be collected and a research programme launched in December 1990 on different aspects of this overall subject: the economic collection and stocking of rain water, the problems of water filtration, the construction and maintenance of village wells, the development of functional latrines etc.

Nevertheless, previous work undertaken by engineers on the project has shown a lack of a real enquiry aimed at finding answers to specific and real problems. There has been instead a tendency to repeat the same experiments and prototypes, without enough effort at adapting them to the local contexts, nor building from the basis of what is already used by the people. Thus in several different communes one finds almost identical prototypes. The proposed mission is intended to address this situation

### Objectives

1. To briefly evaluate work already undertaken in the preceding months in communes from Group A where project staff have already been working. (General evaluation reports for each Group A commune have been prepared.)
2. To perfect simple diagrammes ("algorithms") adapted to the local context to aid the choice of technologies for water and sanitation.
3. To briefly evaluate tools/media for dissemination used by other programmes (e.g. the UNICEF pump) and make recommendations on how these could be improved or utilized in the context of this project.
4. To evaluate the suitability of water analysis "kits" in situ and make recommendations on procedures and products which can be used in Vietnam, and without creating dependence on international suppliers.
5. To comment on water and sanitation studies underway in Ninh Van and finalize decisions on the choice of experimental sites, to realize prototypes and suggest methods of evaluation.

6. To review the existing documentation already supplied to the project and suggest other works and studies as appropriate.

**Expected results**

Dossiers on methodology (choice of water technology, individual purification);

Dossiers on water analysis;

A report on the technologies proposed and agreed upon with the counterpart staff.

**Duration**

3 weeks in Vietnam (March 1991).

**Conditions**

Living accommodation will be provided. The consultant will be provided with a motor vehicle and a driver. The consultant will be provided with a daily allowance for living expenses. The consultant will be provided with a daily allowance for living expenses. The consultant will be provided with a daily allowance for living expenses.

Air travel from your current place of work to Hanoi will be at economy class. The consultancy will be provided with a daily allowance for living expenses. The consultancy will be provided with a daily allowance for living expenses.