UNCHS

Project VIE/86/020

Appropriate Technology Transfer in Construction

Ninh Van Commune

Ha Nam Ninh Province

Basic needs and local resources

Proposed actions

1st Interim report

December 1990

NCRPD - DW/GRET

Contents

II/ Resources and mobilization of local capacity

1.Social organisation
2.Natural resources
3.Built environment
4.Capital installation
5.Human resources
6.Economic resources
7.Synthesis and Table

III/ Proposed actions / Criteria for choice of technology / Work plan

1. Synthesis and global work plan
2. Proposed actions (1 to 12)
3. NCRPD specialists

IV/ Annexes

1. Methodology (Identification/Research-Action/Evaluation-Diffusion)
2. The built environment in Ninh Van
3. Chemical analysis of water in Ninh Van
4. Data sheets used for Ninh Van survey

Preliminary note

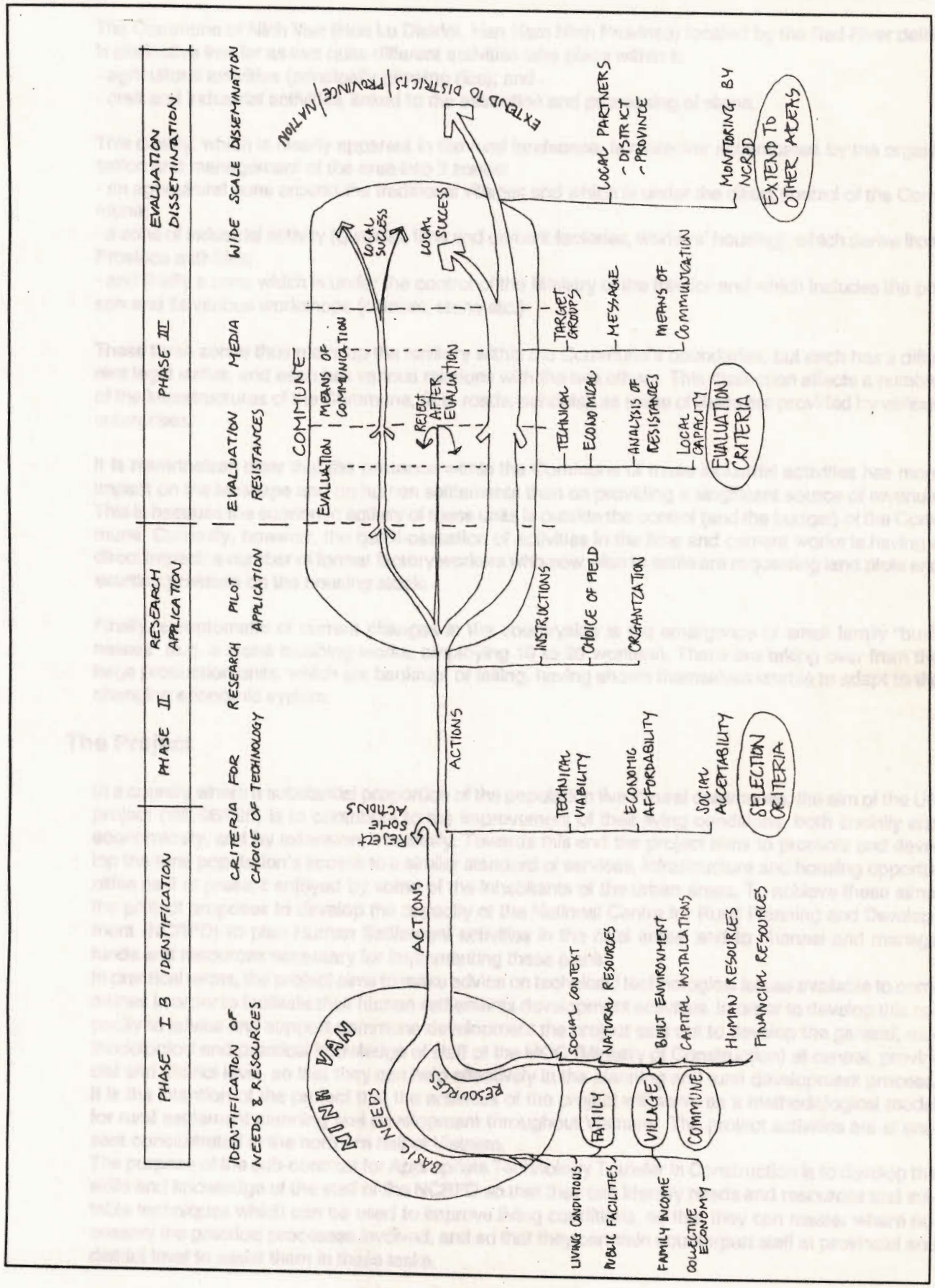
This document presents the first stage of the identification of proposed actions - in the rural built environment or economic and social infrastructure - in Ninh Van Commune and is based on the methodology developed by the NCRPD staff with the Project Sub-contractor, DW/GRET (see Annex 2).

The survey was carried out by a small team working over a short period (3 weeks) and requires complementary data in certain areas. It therefore represents a positive development in improving the approach of the NCRPD in tackling issues related to Appropriate Technology Transfer.
A significant amount of work had already been undertaken in Ninh Van by a team from the IURP (Institute for Urban and Rural Planning) in 1989, thanks to which a great deal of data was collected, maps drawn and contacts organized with the local authorities.

The present survey and analysis aimed to identify more in more detail the basic needs and main problems of the inhabitants of the commune (at different levels), to analyse local resources (social, natural, human, economic etc.) and the capacity to mobilize these, and to synthethize this approach by proposing actions, with criteria (technical, economical, social) for the choice of technology if appropriate, in order to solve the main problems using the local resources available.

The proposed actions aim not only to resolve a specific problem in the Commune (for example the need for clean water in the dry season) but at the same time to develop the capacity of the NCRPD to organize, at different levels (Province, District, Commune), a "Technical Assistance in Rural Development" service.

Appropriate Technology Transfer Process / NCRPD-DW/GRET



Introduction

The Commune of Ninh Van (Hoa Lu District, Han Nam Ninh Province) located by the Red River delta, is distinctive insofar as two quite different activities take place within it:
- agricultural activities (principally growing rice); and
- craft and industrial activities, linked to the extraction and processing of stone.

This duality, which is clearly apparent in the rural landscape, is moreover accentuated by the organisation and management of the area into 3 zones:
- an agricultural zone around the traditional villages and which is under the direct control of the Commune;
- a zone of industrial activity (quarries, lime and cement factories, workers' housing), which derive from Province activities;
- and finally a zone which is under the control of the Ministry of the Interior and which includes the prison and its various workshops (cement, stone etc.)

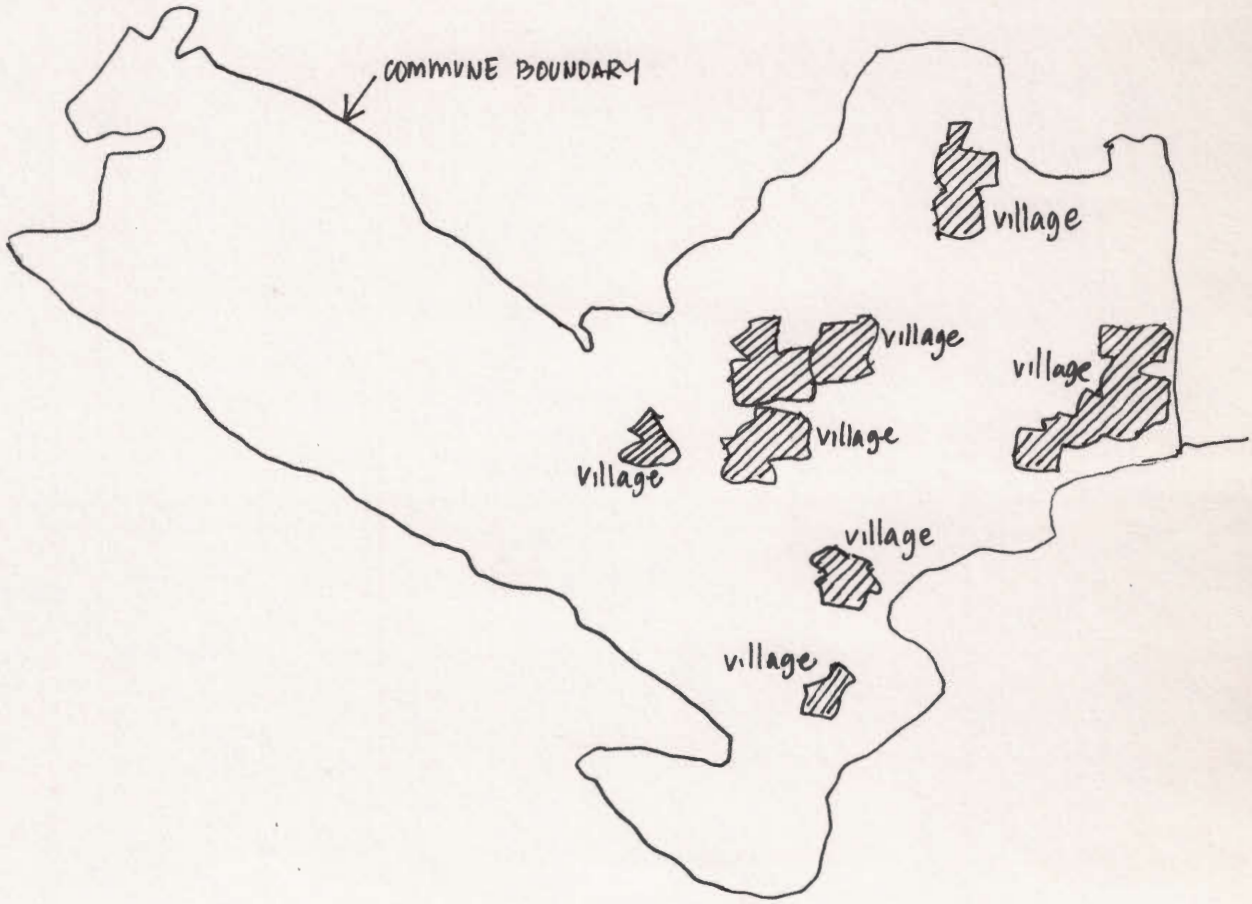
These three zones thus make up the territory within the Commune's boundaries, but each has a different legal status, and each has various relations with the two others. This distinction affects a number of the infrastructures of the Commune, (e.g. roads, schools), as some of these are provided by various enterprises.

It is nevertheless clear that the presence within the Commune of these industrial activities has more impact on the lanscape and on human settlements than on providing a singificant source of revenue. This is because the economic activity of these units is outside the control (and the budget) of the Commune. Currently, however, the quasi-cessation of activities in the lime and cement works is having a direct impact: a number of former factory workers who now wish to settle are requesting land plots and exerting pressure on the housing stock.

Finally, symptomatic of current changes in the countryside is the emergence of small family "businesses" (e.g. a stone crushing works, employing 10 to 20 workers). These are taking over from the large production units, which are bankrupt or failing, having shown themselves unable to adapt to the changing economic system.

The Project

In a country where a substantial proportion of the population live in rural communes, the aim of the UN project (VIE/86/020) is to contribute to the improvement of their living conditions, both socially and economically, and by extension, materially. Towards this end the project aims to promote and develop the rural population's access to a similar standard of services, infrastructure and housing opportunities as it at present enjoyed by some of the inhabitants of the urban areas. To achieve these aims, the project proposes to develop the capacity of the National Centre for Rural Planning and Development (NCRPD) to plan Human Settlement activities in the rural areas, and to channel and manage funds and resources necessary for implementing these plans.
In practical terms, the project aims to make advice on technical / technological issues available to communes in order to facilitate their human settlements development activities. In order to develop this capacity to advise and support commune development the project sets out to develop the general, methodological and practical knowledge of staff of the MOC (Ministry of Construction) at central, provincial and district level, so that they can help effectively in the planning and rural development process. It is the intention of the project that the activities of the project will serve as a methodological model for rural settlement planning and development throughout Vietnam. The project activities are at present concentrated in the northern half of Vietnam.
The purpose of the sub-contract for Appropriate Technology Transfer in Construction is to develop the skills and knowledge of the staff of the NCRPD so that they can identify needs and resources and suitable techniques which can be used to improve living conditions, so that they can master where necessary the practical processes involved, and so that they can train counterpart staff at provincial and district level to assist them in these tasks.


COMMUNE BOUNDARY
village
village
village
village
village
village
village
village

To this end, the various sector studies relating to Ninh Van Commune and presented in this report are related to 3 key levels of the rural built environment:

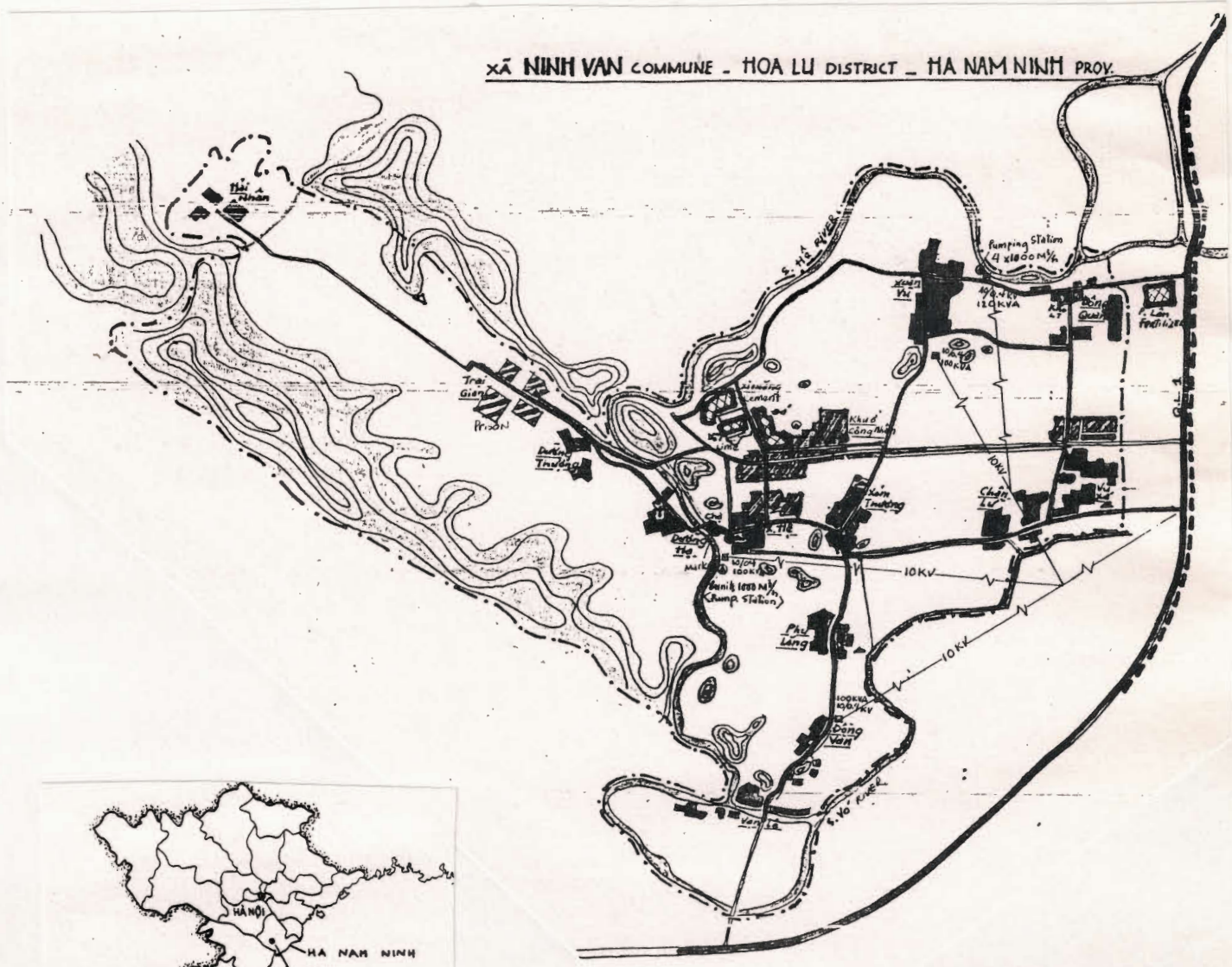
* the nuclear family (by which we mean essentially a couple and their children, as opposed to the extended family), which is now considered to be the basic cell of economic life, particularly through agricultural activity, (thanks to the redistribution of collective land through production "contracts"), and craft-based or commercial activities;

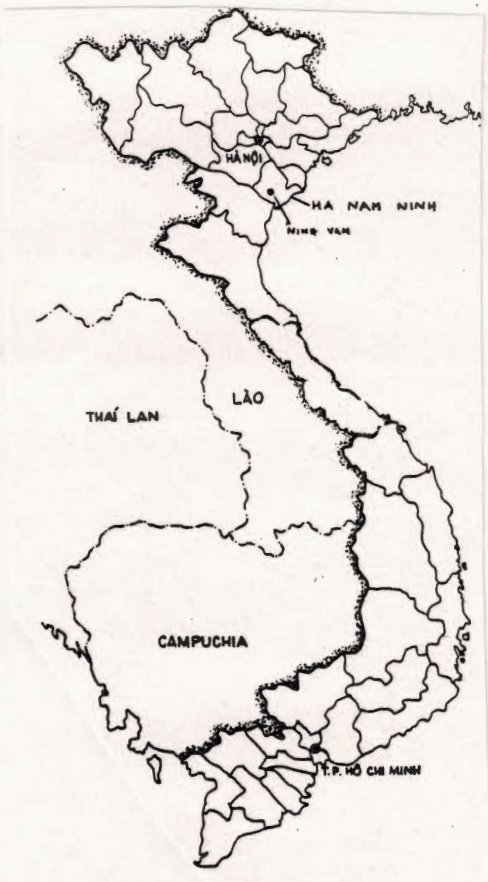
* the village, the traditional unit of rural Vietnam, embracing within a more or less enclosed area from 50 to 500 families and surrounded by argicultural land; certain local services are provided within the village (e.g. wells, kindergartens, a trained nurse);

* the Commune (*Xa*), the basic administrative unit, which covers several villages and provides administrative services, such as education, culture and health. The Commune organises activities within its boundaries, with the support and help of the higher administrative echelons - District and Province - as is indeed the case for Ninh Van.

These three key levels enable a better understanding of the elements relevant to rural development and a sharper focus for the initiatives proposed (with clearly identified "target" groups).

Location and plan of NINH VAN Commune





I/ Basic needs and main problems

1. General situation of Ninh Van commune

1.1. Location

Ninh Van commune is situated in the southern part of Hoa Lu District, Ha Nam Ninh Province, at 10 kms distance from Hoa Lu district town and Ninh Binh provincial town, and nearly 100 kms from Hanoi which is reached by National Road no. 1. The commune is located in the southern area of the Red river delta, which was formed as a result of a natural delta formation process and sea recession. The commune adjoins the western side of National Road no. 1 and main railway links; the national road is connected to the centre of the commune (about 2 kms distant) by 2 main feeder commune roads. There are 2 rivers: He and Vo on the northern and southern borders of the commune respectively.

1.2. Geography

Characteristics: The land is generally flat and low-lying, the agricultural land and part of the human settlements being flooded, to an average depth of one meter in the storm season (August, September and October). The most low-lying part is the southern and western half of the commune and includes the agricultural land of Phu Lang, Dong Van, Van Le, Duong Thoung and the new economic sector of Hai Nhan. Scattered amongst the fields of the commune are rocky outcrops of lime-stone and granite. In the main area of cultivated land behind the He and Vo river dyke in the southern part of the commune, there are more than 10 of these rising to an average height of 40 to 50 meters and which are quarried to produce various building materials. The area formed by the He river dyke, in the western part of the commune, is a small valley, now exploited, and bounded by stone and soil mountains.

1.3 Formation / history

The land in this area has been cultivated and settled for some thousand years. The process of cultivation and improvement accelerated after the 13th and 14th centuries to the present day with the establishment of settlement of the original villages (Dong Quan, Vu Xa, Chan Lu, Xuan Vu, Xom Thuong). Since 1955, the process of cultivating and extending arable land has continued with the establishment of new villages: thus Hai Nhan, to the southeast, together with the construction the commune's irrigation system for intensive farming and crop-increasing (50% of the cultivable land produces two paddy crops a year). The natural features of the easily-exploited limestone hills, have favoured such activities as house and bridge construction, the production of manual tools for agriculture and fine art handicrafts in carved stone. These activities have been initiated and developed alongside paddy farming. In the harsh conditions of floods and storms, the local people have shown great tenacity through the centuries and through their efforts have created architectural and sculptural works of high artistic quality and able to withstand the test of time. These are to be found today in temples, pagodas, communal buildings, churches, and houses in many local villages throughout the country.

1.4. Land use.

The total area of the commune is 1230 ha including:
- arable land: 571 ha or 46.5% of the total; (of this 436.7 ha consist of paddy fields, the remaining 134.3 ha being non-cultivated land mainly in Hai Nhan and Van Le);
- lime-stone outcrops and hills: 479.2 ha or 39% of the total;
- land taken up by irrigation and communication systems: 55 ha or 4.5% of the total;
- human settlements: 125 ha or 10% of the total.

The latter (human settlements) are broken down as follows:
- factories and enterprises within the commune 60 ha (including the cement and limestone works, food store and prison);
- settlements: 65 ha (including 35.6 ha taken up by household plots and 18.7 ha by ponds.)

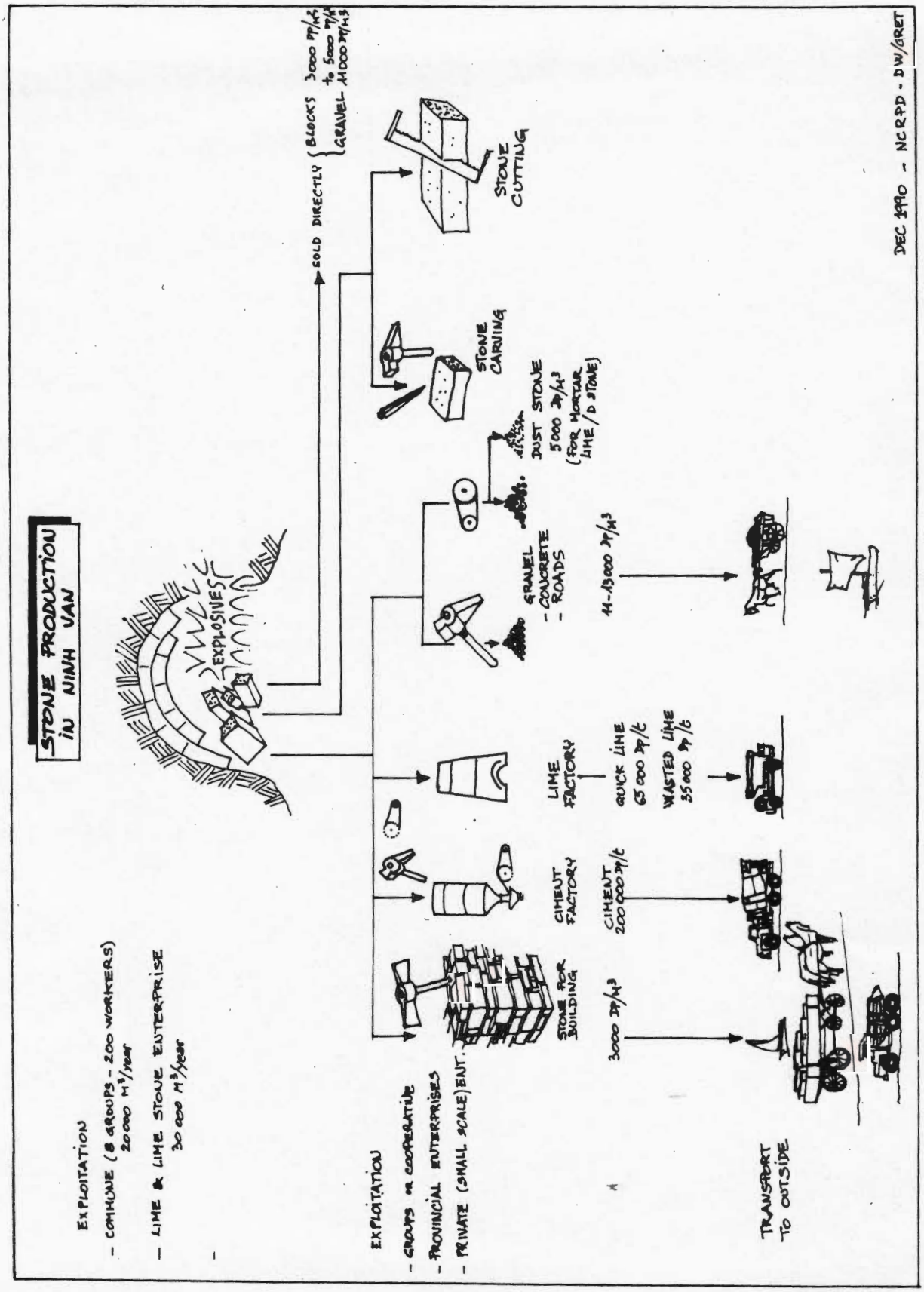
Ninh Van Commune

Stone carving

Embroidery

Trade

Stone production



2.3. Village / commune economy.

Peasants are grouped in two cooperatives: Dong Van (219 ha of cultivated land) and Tay Van (217 ha). With the new policy of agricultural delivery quotas cooperatives are mainly responsible for such technological services as provision of seed , fertilizers, insecticides, for managing pumping stations and collecting taxes.

At present the commune has two electric pumping stations for irrigation thanks to which nearly 50% of the cultivated area yields a double rice crop. In general the existing system of irrigation and electric pumping is inadequate for intensive farming and crop increasing and certainly insufficient to allow for extending to the new cultivable land (the new economic sector Hai Nhan and uncultivated areas in Van Le have nearly 134 ha not supplied).

Apart from agricultural activity, the commune has organized bids from private groups for in stone quarrying for construction materials (8 groups are involved i quarrying and and 6 produce gravels). The annual output of stone for building is 20,000 m3. Stone is in great demand and can provide work for the peasants in their slack season, but the manual working conditions are too arduous. Hence the construction of the Van Le - Tam Diep road for stone exploitation and transportation in the southern part of the commune is greatly desired by the commune. State factories such as the cement, lime and stone factory (He Duong), are encountering major difficulties in production and consumption due to their high product costs and poor production management, to the extent that in the case of the Thanh Son stone-cutting cooperative, for example, production had to be stopped due to bad management.

The commune market is in a favorable location, convenient for river transport, and provides an outlet for one to two hundred vendors. Few items are for sale, however, and these are placed directly on the ground without shelter and there is nowhere to display and exchange unique local products such as carved stone objects.

Summary 2

* Important source of revenue: stone production;
* wide differentiation between rich and poor families;
* serious problems being experienced by large factories.

Stone production

Stone products

3. Human settlements

3.1. Traditional villages and new settlements

The commune's population is settled in 13 new and old villages including a new settlement for the families of workers employed in the cement, lime and stone factory (about 300 families) and the newly-formed village known as Hai Nhan (100 people).
Population distribution is uneven, however:

* One of the biggest traditional villages, Xuan Vu, has a population of 1605 or 420 families and contains a "worker" village with a population of 1200.
* 3 traditional villages have populations of over 500 (Vu Xa, Phu Lang, He).
* 6 villages have populations between 300 and 500 (Dong Quan, Chan Vu, Thuong, Van Le, Duong Ha, Duong Thuong).
* 2 villages have about 100 people (Dong Van and Hai Nhan).

In the traditional villages are to be found ancient stone pagodas, temples, churches and wells. Village roads and lanes surfaced with stone are fairly comfortable to use.

The commune's main socio-administrative centres consist in the People's Committee meeting house, school, public heath centre, and an area set aside for artistic performances in the Thuong village which is central with adequate communications and within reasonable distance of other settlements.

Living area per household within the commune is relatively small, the average being 300 m2/household. Within this average, long-standing settlers tend to have larger living areas, from 400 to 500 m2/household, whereas new settlers are provided with only about 200 -240 m2/household.
Most households have small ponds for washing and raising fish. Gardening is limited due to lack of space, but breeding pigs and fish farming are common.

The new area of Hai Nhan has difficult road communications: the road from the prison is crossed by canals and ditches. Some newly-settled families here are settled quite randomly, without planning guidance.

3.2. Public construction

3.2.1. Schools

Ninh Van commune has a primary and secondary school, built at Thuong village in the centre of the commune. The school has 5 blocks of houses with a total of 16 rooms, enough for 1480 pupils studying in 2-term shifts. Apart from these, about 320 pupils in the 1st and 2nd forms are spread between 5 other schools in different villages.

The schools are made of stone, with tiled roofs with bamboo and timber frame.
They provide basic accommodation for the pupils studying but are not in good condition: for example they are missing window panes , have only earth-floors, old and broken desks, and lack natural light for pupils especially in winter.

In 1987 a 2-storey building was planned for the secondary school but at present it remains unfinished, only the 1st floor being useable. It was constructed thanks to local participation from the commune with the help of building firms.

3.2.2. Clinics.

In 1976 the commune built a 20-bed clinic, manned by 5 nurses at Thuong village. Two out of the 5 nurses are educated to secondary level, the remaining 3 to primary level. By 1985, the commune had built a more convenient consulting examination which is also used for publicity campaigns on health and family planning.

Public buildings

People's Comittee

Secondary school

Temple

Houses in Ninh Van

Traditional house

New settlement house

3.4. Building materials and technologies.

3.4.1. Stone.

Stone is a very common building material in Ninh Van and is widely-used for houses, roads, walls, and bridges. The people are experienced in the use of stone and are accustomed to building stone foundations and walls. The average size of the rough stone blocks used for masonry is 15 x 20 x15 cms and walls are built 30 cms thick. 1 m2 of wall typically requires 0.6 m3 of stone blocks and 0.5 m3 of mortar (1:3, poor lime:stone dust).

Stone production also supplies aggregate for concrete and road construction. 3 sizes are produced: 4 x 6, 2 x 4 and 2 x 2 cms.

Carved stone is used for windows, door openings and special decorative effects, but has to be specially commissioned because of its high cost.
Marble for decoration and finishings has also been produced on occasion.

Skilled stone masons are available in the commune, (4 - 5 masonry groups in each village) and could meet external demand.

3.4.2. Wood.

Wood is available on the market and from the gardens. Wooden structures are very popular even in small houses, especially for the traditional roof structures and wood is universally used for shutters. Wooden framed houses are only found in old traditional buildings. Villages carpenters are available in the commune.

3.4.3. Bamboo.

Bamboo is used in the roofing system for everything from beams to battens. Bamboo roofs with a thatch covering can be found in temporary houses throughout the commune.

3.4.4. Roof covering materials.

Fired clay tiles (22 tiles/metre) are available on the market, originating from Ninh Binh.
Cement tiles are produced in He Duong cement factory, and sometimes a team of workers will produce them on the owner's building site.
Thatch is used only for poorer families' houses.
Concrete roofs are increasingly used in Ninh Van, with steel bars arranged [?] 15 x 15 cm or 10 x 15 cm and concrete poured in situ 7 - 10 cms thick.

3.4.5. Others

a. Steel.
Imported steel for construction is available on the market.

b. Cement.
Cement is locally produced in He Duong cement factory with a 200 -300 strength factor, but the quality is irregular. Bim Son cement is also available on the market, with a strength factor of 300 or 400 and consistent high quality.

c. Quick lime.
Quick lime is produced in the He Duong lime and stone factory, (located in the commune).

d. Fired bricks.
These are common in the area and are used for wall-building, but not for foundations because of flooding.

Costs of building materials in Ninh Van

Material	Origin	Unit	Cost (Dongs)
Stone	Ninh Van	m3	3 000
Aggregate 1x2	Ninh Van	m3	13 000
Dust stone	Ninh Van	m3	5 000
Quick lime	Ninh Van	t	65 000
Wasted lime	Ninh Van	t	35 000
Cement	Ninh Van	t	200 000
Cement	Bim Son	t	380 000
Sand	Ninh Van	m3	12 000
Burnt brick		u	80
Red tile	Ninh Binh	u	230
Cement tile	Ninh Van	u	200
Steel o6	Imported	t	3 300 000
Hard wood (tree)	Ninh Van	m3	100 000
Hard wood (timber)		m3	300 000
Bamboo	Ninh Van	tree	3 000

e. Lime stone blocks.
These are also produced within the commune and available on the market, and are used to build walls of houses or plots.

3.4.6. Construction costs

House with stone walls and cement tiles : 120,000 d/m2
Mason : 5,000 d/day

Summary 3

* traditional agricultural villages - large plots v. new industrial workers' settlements - narrow plots;
* basic building materials: stone blocks (undressed);
* house construction - a long process (2-5-10 years).

	1	2	3	4	5	6	7	8	9
LOCATION									
From	Thuong c.	Prison	Vu Xa	Fert. factory	Dong Quan	Cement fac	Cement fac	Thuong v.	DQ-Vu Xa
To	Tam Diep	Hai Nhan	Vo bridge	Cement fact.	Cement Fac	Prison	Yen bridge	Prison	Clinic
Type	Interc. 5	Interv. 5	Interc. 5	Interc. 4	Interc. 4	Interv. 4	Interc.5	Interv.5	Interv.5
CHARACTERISTICS									
Lenghth	4995	1550	700	2520	2500	3000	3500	4815	2400
Width	2.5-5 m	3-5 m	2-5 m	5-8 m	5-8 m	3-5 m	5 m	2.5-3 m	3-5 m
Materials	e/st 3500 e 1450	e/st 500 e 1050	earth	pebble	pebble	e/stone earth	e/stone earth	e/stone	e/stone
TRANSPORT									
Means of transport	bic.,oxcart	bic.	oxc.	all	all	all	all	all	all
Items	people,goods	farm prod.	farm p + fuel	all	all	all	all	all	all
CONSTRUCTION									
Year	1964	1979	1983	1990	1976	1979	1967	1950	1965
By	Commune	Comm + pris.	Commune	Com. + Cemt.	Com + St.Ent.	Prison	Commune	Commune	Commune
Cost	25 000 D/m		30 000 D/m	7 000 D/m2			200 000D/m		
Labour	5 w.d/m		6 wd/m	Lab + mach.			20 wd/m + ma		
MAINTENANCE									
Every	Year	No	Year		1990	Year	No	Year	Year
By	Commune		Commune		Com + St.Ent.	Prison		Commune	Commune
Cost	100 D/m2		500 D/m		350 D/m2	100 D/m2		100 D/m2	100 D/m2
Labour	0.1 wd/m2		2 wd/m		Peop. + mach	0.2 wd/m2		0.1 wd/m2	1 wd/m2
Supervision	Commune		Commune		Com + St.Ent.	Prison		Commune	Commune
GLOBAL SITUATION	Bad	Very bad	Bad	Rather good	Medium	Medium	Bad	Bad	Bad
CLASSIFICATION	C 4-5	C 4-5	C 4	C 2	C 2-3	C 3-4	C 3-4	C 4	C 3-4
PRIORITIES	2 From Class 5 To Class 2	1 From Class 5 To Cl.3 or 4	Maintain	Maintain	Maintain	Maintain	Maintain	Maintain	Maintain

Classification
C 1 : All transports, all seasons, velocity
C 2 : Lorry (to 10 t)
C 3 : Lorry (to 5 t)
C 4 : Oxcart, motorcart
C 5 : Bicycle

Source : NCRPD-DW/GRET Dec 1990

4. Communication and transport

4.1. Links

4.1.1. Land transport

Ninh Van commune embraces 13 villages. The road network, for both daily intercourse and industrial production needs, consists of local tracks, main commune roads, inter-village roads, and commune roads.

Main roads exist as follows:
* earth roads: L [length] 7 250m; B [breadth] min 2.5m, max 5m
* earth-stone roads: L 12 200m; B min 2m
* pebble roads: L 8 000m

Apart from these, inter-village roads are as follows:
L 30 000m (30 kms); B min 1.5m, max 3m; D (depth) 10 - 75 cms.

An analysis of the present road links in Ninh Van is presented in the table "Survey of roads in Ninh Van"; roads are classified according to their maximum vehicle capacities :
* C5 - bicycle;
* C4 - oxcart/motor cart;
* C3 - lorries (5t) ;
* C2 - lorries (10t);
* C1 - all vehicle types in all seasons.

This analysis allows the following observations:

a. Road links are capable of meeting communication needs between human settlements and production locations, and between villages, the commune and neighbouring communes [? "neighbourhood"].

b. The road between Dong Quan and Cement factory (no. 5) was been repaired and improved in early 1990 and can be used by all types of vehicles. The standard of other roads, however, is below average (bumpy and flooded in the rainy season).

C. A number of roads are not wide enough to allow 2 cars to pass. Some roads near the dyke are permanently under water in the flood season. The height of the roads is generally too close to that of the rice fields, so that they can be easily swept away .

d. The bridges spanning the river (except at Duong Thuong) can carry up to 8-ton lorries; others up to 3-tons only. Some roads act as principal link roads within the commune, although many of them are originally local tracks, made out of earth and therefore unable to take all vehicles. These include the roads between the cement factory and Yen bridge station (no. 7); between Vu Xa and Cau Vo (no. 3); between the prison and Hai Nhan (no. 2) and between Van Le and Tam Diep (no. 1).

4.1.2. River transport

Three sides of the commune are bordered by the He Duong and Ghenh rivers, giving a total of 7500m of river bank, average width 25m, average depth in the dry season 1.5m from the cement factory to Yen bridge 1.5m and 0.80m from the cement factory to Van Le. From the cement factory to Yenbridge the river can carry all types of navigation: 20-ton capacity boats and 50-ton capacity barges. From the cement factory to Tom cave 5-ton capacity boats can navigate, rising to 10-ton capacity boats in the flood season. There are a total of 9 landing points, of which 6 are controlled by the commune and 3 by the cement factory and stone and lime works.

Roads in Ninh Van

Class 5

Class 4

Class 2

Means of transport

Hand cart

Ox cart and lorry

Boat

4.3. Building and transportation costs

4.3.1. Building costs

The abundance of natural resources at Ninh Van makes the cost of building in stone cheaper than in other locations. Thus the cost of building foundations can be calculated as follows:
- 1 working day/m3 = 5,000 d/m3 (for earth)
and the cost of building road surfaces with pebbles, as follows:
- 1 layer 10 cms deep = 7,000 d/m2
- 2 layers (including a stone foundation) 25 cms deep = 25,000 d/m2.

4.3.2. Transportation costs

The comparable cost of transport has been calculated for any means of transport, using any roads. and allows individual calculations to be made for each particular instance. Actual costs, however, still ultimately depend on negotiation between the owner of the means of transport and his client.

4.4. Overview

From this analysis of the transport situation in Ninh Van , it is clear that there are a number of pressing needs:

The river links can meet the immediate needs of the commune. However, they are limited: for example there is only a one main road-river link, at the fertilizer factory, and this road-river junction gives access to other communes to the north of Ninh Van.

As far as transport between Ninh Van and other communes to the south are concerned, transport means are not fully exploited because the roads are narrow, made of earth and flooded in the rainy season, so that it becomes necessary to travel increasing distances.

The present road network within the commune is inefficient. No new road link has been created to meet the new of the new economic development zone.

Given the current needs and capacities of the commune, improvement can be made in the following areas:

- throughout the commune, (with the exception of the road from the fertilizer factory to the cement factory), main commune roads can be built using the existing network. i.e.:
- north-south: Xuan Vu, Thuong, Phu Lang / Dong Van - Van Le and Tam Diep.
- east-west: from the National road through Vu Xa, Thuong, lime-stone works - prison, Hai Nhan.

From these main commune roads other roads can be built to create an efficient road network allowing easy and convenient communication between production sectors, human settlements and between this commune and others to the north and south.

Analysis of means of transport

Type	Characteristics	Cost Investment	Capacity (kg)	Speed (km/h)	Cost D/t/km	Quantity
Pers.	Light transport /prod.	0	50	4		1000 t/year
Bicyc.	Near transp. 3-5 km	100 000	100-150	5		2000 t/year
Cart	Transp.within the com.	200 000	600	4	2400	
Oxcart	"	1 200 000	1 500	4	1600	400 t/day
Motorcart	"	4 000 000	1 500	10		
Lorry 1	5 t	30 000 000	5 000	30	200	
Lorry 2	10 t	50 000 000	10 000	30	200	
Boat 1	5 t	5 000 000	>5 000	8	100	900 t/day
Boat 2	10 t	10 000 000	>10 000	8	100	

Cost of transport

Boat

	Cost D/t/km	
D (km)	State	Private
10	460	575
20	250	320
50	120	165
100	80	110

Goods Category 1
River Class 1

Lorry

Road class	1	3	5
D (km)	Cost D/t/km		
1	1035	1220	1420
10	215	280	400
20	145	205	310
50	105	150	235
100	95	140	225

Goods Category 1

Oxcart

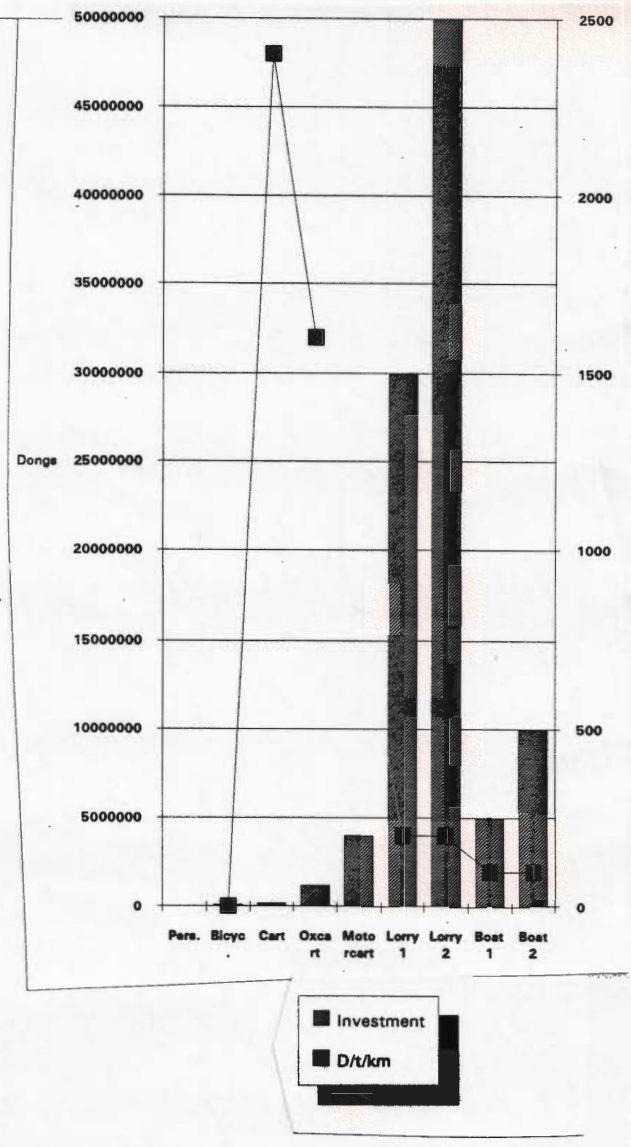
Road class	1	2	3
D (km)	Cost D/t/km		
<1.5	1640	2015	2535
2	1320	1610	2030
>3	1100	1340	1700

Goods Category 1

Cart

Road class	1	2	3
D (km)	Cost D/t/km		
<1.5	2200	3000	3600
2	1760	2400	2900
>2.5	1600	2200	2650

Goods Category 1



Source : NCRPD-DW/GRET Dec 1990

In order to build these roads, the following problems must be resolved promptly:

a. 1st priority:

Widening, raising the height of, and surfacing with stone the road from the prison to Hai Nhan, giving:
foundation depth: 1.8m
foundation width: 4m
surface width: 3m.

b. 2nd priority:

Widening and raising the height of the road from Van Le to Tam Diep, giving the same foundation and surface measurements as above.

c. Widening and improving the road from Xuan Vu to Van Le, giving an overall foundation width of 4m and road surface width of 3m.

The volume of work necessary to undertake these tasks is as follows:
* improving and surfacing with stone existing roads: 14,000 m2 = 70,000,000 d;
* new surfaces: 21,000 m2 = 210,000,000 d
* banking up earth for foundations and widening: 15,000 m3 = 75,000,000d.

These estimates do not take account of the capital importance of maintaining communications existing and new links, including roads, rivers and bridges.

Summary 4

* important network of roads and navigable passages;
* generally poor state (lack of maintenance and flooding);
* needs/priorities: 1 new village (He Nhan), 2 south Le-Tan Diep (stone exporter).

Water supply and sanitation in Ninh Van

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
WELL	**19%**	**19%**	**26%**	**33%**	**32%**	**32%**	**25%**	**29%**	**27%**
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%
VILLAGE WELL			**53%**		**45%**	**44%**	**64%**		**28%**
good q.									0%
medium q.			100%		100%	80%	60%		83%
bad q.						20%	40%		17%
RAINY WATER TANK	**26%**	**23%**	**23%**	**31%**	**26%**	**30%**	**28%**	**29%**	**26%**
good q.	100%	95%	100%	100%	100%	90%	100%	100%	98%
medium q.		5%				10%			2%
bad q.									0%
RIVER	**46%**	**71%**		**8%**		**6%**	**11%**	**29%**	**17%**
good q.									0%
medium q.	50%	50%		50%		40%	65%	50%	51%
bad q.	50%	50%		50%		60%	35%	50%	49%
POND	**31%**	**19%**	**41%**	**41%**	**51%**	**38%**	**54%**	**14%**	**36%**
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%
WATER FILTER						**13%**	**4%**	**30%**	**5%**
good q.						100%			28%
medium q.							100%	100%	72%
bad q.									0%
LATRINE	**28%**	**28%**	**30%**	**33%**	**46%**	**38%**	**36%**	**29%**	**31%**
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

5. Water supply and sanitation

5.1. General situation

5.1.1. Water supply

Ninh Van commune consists of 13 human settlements scattered throughout its area. The commune's water supply is diverse and from various sources: collected rain water, water drawn from family and village wells, and water taken from rivers and ponds.

A single family may use water for cooking and other purposes from one or more sources, depending on the circumstances of each family and the local sources of water. (See Table "Water use in family".) It is common for one family to use both rain water and water from the family or village well or river water.

The following observations can be made after an evaluation of the quality of the water supply:

- rain water from a good water container can be used for cooking and drinking;

- water from family wells falls into two categories: water originating from the mountainous region is clear and good quality, and can be used without being filtered, whereas water which has seeped through the ground is cloudy and has a high iron content (especially in Dong Quan and Xuan Vu) and can only be used after being treated and filtered.

- the same applies to village wells; in addition, the quality of water from carefully built wells is better than that from ground wells. However sanitation around and in the wells is bad, so the water fails to meet adequate sanitary criteria for cooking and drinking.

- river water is used after a night of sedimentation without being filtered or cleaned with alum, so the quality remains bad.

- most of the water-containing and filtering facilities in the commune consist of tanks of varying capacities depending on the specific circumstances of each family, but mainly built in brick and stone. Some families have built filtration tanks of various shapes and capacities and located them differently, but these fail to meet the technical and planning criteria of the NCPRD.

5.1.2. Sanitation

In response to a campaign on "Sanitation for wells, bathrooms, latrines", the whole commune at one time built 400 latrines. Most of these are now unusable: only 30% of the families in the commune have latrines, and of these one third are in good condition. It is therefore common to use a neighbour's latrine. Latrines are built of two basic kinds of material: brick and stone.

5.1.3. Overview

In general, water supply and sanitation in Ninh Van commune is currently very poor. Improvements are needed to upgrade the living conditions of these rural people.
In order to tackle the major problems identified, a more intensive survey and research is required to gain an in-depth understanding of the real conditions and capacity of each family and in order to put forward appropriate and practical solutions. This report therefore proposes only a number of basic and general actions to be undertaken, pending the acquisition of more detailed data.

Water : origin and use

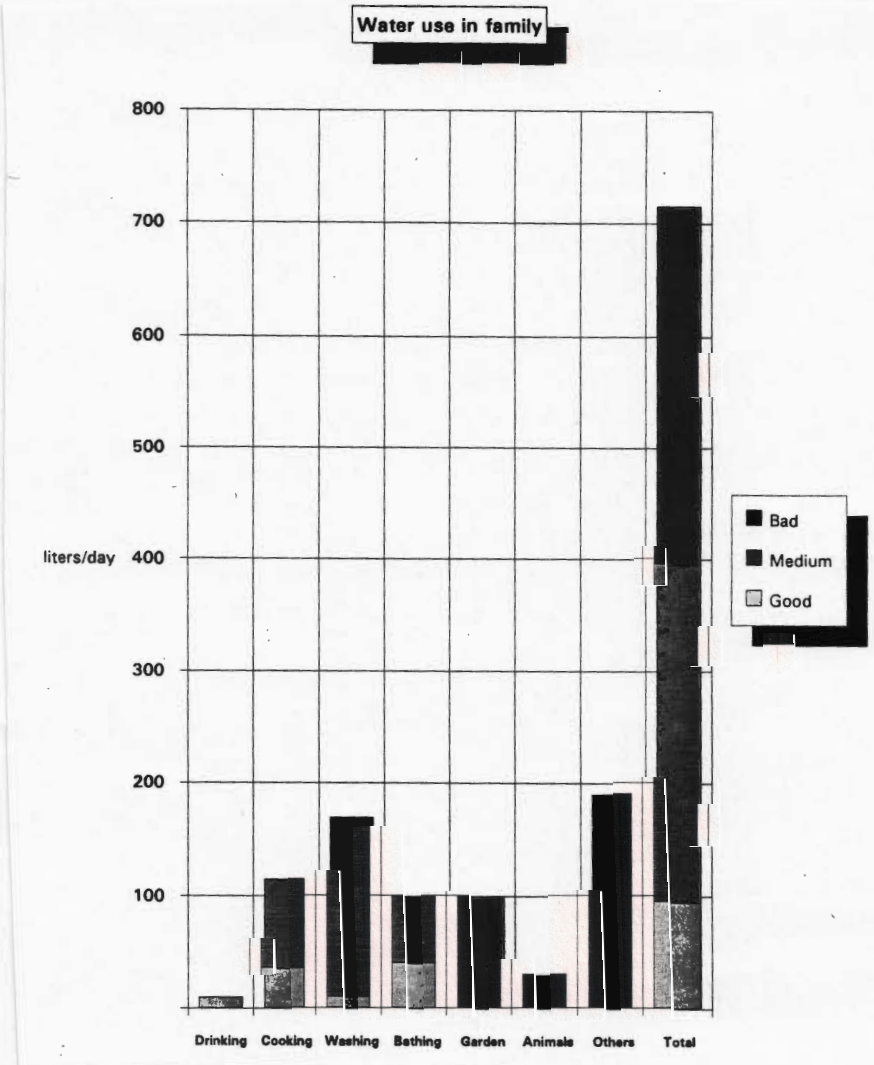
Village of :	Xuang Vu
Family :	Huy Cam

Origin	Quality	Drinking	Cooking	Washing	Bathing	Gardening	Animals	Others	Total
Water tank	Good	10	35	10	40				95
Well	Medium		80	160	60				300
Pond	Bad					100	30	190	320
Total		10	115	170	100	100	30	190	715

Village of :	Xuan Vu
Family :	Huy Phong

Origin	Quality	Drinking	Cooking	Washing	Bathing	Gardening	Animals	Others	Total
Water tank	Good	13							13
Well	Medium		120	160	120			60	460
Pond	Bad			80		200	40	100	420
Total		13	120	240	120	200	40	160	893

Source : NCRPD-DW/GRET Dec 1990



5.2. Proposals relating to water supply in Ninh Van commune

Given the present situation of water supply of Ninh Van commune, with various sources of water being used daily, one approach is to put forward a rational use of a combination of water sources including rain water, water from family wells, village wells and from rivers. The use of one source or multiple sources will be dictated by the specific circumstances of each family and locality.

5.2.1. Rain water

Within this proviso, however, one approach would be to encourage the use of rain water for cooking in families living in houses with tiled roofs houses by building high-capacity tanks capable of containing enough water for a long period or for the whole year.
A rain water tank built of stone or concrete with a capacity of 6m3 would cost in the order of 215,000 dongs.

5.2.2. Family wells

For families without tiled roofs, the construction of family wells should be promoted, the water drawn to be treated or used untreated according to the quality of water from each well. (As has already been noted, well water originating from the mountains is clean enough to use without treatment, but water from the ground, requires filtration in tanks to eliminate mud and iron.).
Family wells should generally be 5 m deep, 0.7 m in diameter, and built of stone (see below) and would cost between 70 and 80,000 dongs. A filtration tank built of 0.4 x 0.4 x 0.4 cm bricks, and containing stone or ceramic would cost in the order of 40-50,000 dongs.

5.2.3. Village wells and river water

Families who have difficulties in building wells (due to lack of finance and space) will continue to use water from village wells or river water. Village wells should therefore be improved to meet minimal sanitary requirements. River water must be cleaned with alum or go through a slow sedimentation process to make it clear and capable of meeting sanitary criteria.

5.2.4. Building materials

Depending on the building materials available in the locality, two main kinds of building material should be used in building for water supply purposes: stone and blocks made from cinder waste material (which is produced by the cement and lime factories), with a preference for the use of stone wherever possible.
Base on the experience , the forms and types of water-storing and treating facilities should be designed to be suitable for the characteristics of building materials.

5.3. Proposal relating to sanitation

In the overall context of poor sanitation conditions in the commune, and given that certain areas are subject to regular flooding and some not, there are two types of latrine:
- in areas not subject to flooding: water latrine,
- in areas subject to flooding: ventilated improved latrine (VIP).

The prototypes of both VIPs and water latrines were specified according to a design supplied by of the public health service. The building materials used are stone and blocks made of cinder waste.
The estimated existing costs in Ninh Van of a 2-pit latrine is 150,000 dongs.

Summary 5

* great disparity depending on localities, the families' resources, the widely differing origins of water,floods;
* limited means for all families.

Water supply

Village well

Private well
and rainy water-tank

Well
and filter

Basic needs / Main problems in Ninh Van

To develop / Level	*Living conditions*	*Public facilities*	*Family income*	*Collective Economy*
Family Level	* Quality of water in dry season * Sanitation in flood areas * Shortage of fuel for cooking during 2-3 months * Lack of domestic light for evening activities * Effects of typhhoons on roofs		* Low productivity in agriculture and stone production * Plots too small in new settlements for activities (garden, animals...) * Hardness of stone production * Credit for small investment too expensive and not available	
Village Level		* New settlements planning not adapted to rural areas * Village wells in bad conditions		* Drainage and irrigation insufficient
Commune level		* Areas affected by flood every year * New reclaim land = desert * Road system in bad conditions * Clinics : lack of budget and material for public care		* Difficulties for main industries : cement, lime, stone enterprise, stone cutting *Difficulties to export stone (roads) * Commune market not well organized * Shortage and high cost of electricity (for pumping and cement plant)
Priorities	**- Clean water supply** **- Sanitation in flooded areas**	**- New settlements planning** **- Village wells** **- Roads maintenance**	**- Credit system**	**- Organization of stone production** **- Commune market** **- New roads for stone production**

6. Synthesis

The table shows the main conclusions of Section I, summarizing the main problems identified for :

* the families
* the villages
* the Commune

with a view to improving :

* conditions of life within an individual plot
* collective services
* the family economy
* the collective economy.

and to define in each case the priorities, following an analysis of the actual situation and the responses to surveys and interviews.

The priorities identified are extremely diverse and moreover overlap: thus the improvement of the organization of stone production will benefit both the collectivity, but also those who make it up, i.e. the families.

This phase - the identification of needs and problems - is one of the most sensitive of the actions in Ninh Van. Thus a "repetitive" approach would ignore the real problems of the Commune and would look no further than tackling their exterior manifestations (e.g. water supply). Thus one of the major problems for the family economy is the absence of credit (other than within the family or usurious).

Social organization in Ninh Van

Organization		Members	Function / Activities	Salary	Comments
Political	Party	- 200	- Mobilize people - Organize mass movements	- 30,000 D/m (2p)	
Administrative	People's Council	- 30 (elected)	- 4 meetings/year -> leadership of commune (economic, social, cultural etc.)	- 3,000 D/m	- Chairman: very active
	People's Comittee	- 7 (elected among P's Council) (Chairman, Vice Ch., Gen. Sec.)	- Executive -> Planning, land control, Irrigation, transport, construction, milicia, culture etc.	- 23 - 30,000 D/m (7)	
	Village	- 1 Head of village (General Front)			
Mass Organ.	General front	- 1 Chairman		- 22,000 D/m (1)	
	Women	- 900 actives (Committee 15)	- Activities in villages (f. planning, handicrafts etc.)	- 22,000 D/m (1)	- For dissemination (latrines, clean water etc.)
	Youth	- 1 General Secretary (Committee 8)	- Social activities, clubs etc.	- 22,000 D/m (1)	
	Farmers	- 1700 members (> repr. > Head)	- Mobilize farmers (agr., fishing, animals etc.)	- 17,000 D/m (1)	
	Syndicate	- Cement factory: 1 group			
Services	Health	- 5 for Commune + 1 nurse/village)	- Clinics : 10 beds - Family planning, disease prevention	- 36,000 D/m (1)	- Lack of communication material
	Education	- 68 teachers (1st, 2nd school) 12 kindergartens (3)	- Education Organize cleaning of villages, sanitation lessons	- 28,000 D/m (4) (50% DISTRICT) ->DISTRICT	
	Culture		- 1 theatre (-> 1000 p. 1/month)		
Traditionnal organization	Family Relatives	- 20 main families in Ninh Van	- Mutual help for production, building...(weddings) - Exchange of labour - Joint investment for small-scale enterprises		- Mutual help
Economic	Cooperatives	- 2 agricultural cooperatives - 1 stone-cutting cooperative - 1 trade + 1 credit cooperative	- Services (seed, fertilizer, equipment...)		
	Groups	- 8 groups - 20 groups	- Stone production - Agriculture		

II/ Resources and mobilization of local capacity

In parallel with a survey of the problems encountered in the development of Ninh Van, it is essential to analyze to what extent local resources can respond to these and how it might be possible to mobilize them through the "Appropriate Technology" transfer process.

Resources have been considered under six headings:
* social (organization, local dynamics, the capacity of the "leaders", mutual help)
* natural resources
* the built environment
* capital installations (existing factories or infrastructures)
* human resources
* economic and financial,

and in the same way as for Section I, from the point of view of 3 different levels of development:
- the family
- the village
- the Commune.

Certain information has already been presented (in a descriptive way In Section I). In this Section II, the focus is more on evaluating and identifying resources to be mobilized.

1. Social organization

The following table summarizes the principal forms of organization within the Commune, and the capacities of the various elements. Due to the lack of a more detailed survey, no complete analysis of inter-family relations and the forms of traditional organization at the heart of the villages can be given.

2. Natural resources

The Commune has two major natural resources at its disposal:

* various stone resources (limestone and marble), some of which are exploited and some not. Stone (and its different forms) are the major source of monetary revenue for families and for the Commune;

* new land, located to the south of the Commune (Van Le) and to the east (Hai Nhan); some areas are not yet exploited, as they need to be drained and irrigated. They are nevertheless and important resources for the Commune in the face of a growing population and to facilitate the permanent settlement of former workers from the cement and lime factories.

3. The built environment

In general terms, the Commune is well equipped in public buildings, such as schools, clinic, administrative buildings, even though some of these are in bad condition (see Section I.3.) As far as families are concerned, the distinction is quite marked and corresponds to their level of income (see table of rich, medium and poor). It should, however, be borne in mind that even for certain "well-off" families, the building process for a house is a long one (up to 10 years) and represents the main investment of a life-time - services are thus irregularly spread in proportion to revenues.

4. Capital installation

At family and village level, the usual activities are to be found; specific to the Commune, however, is the presence of important industries within its area (and in close proximity: such as the phosphate factory).
The cement works (He Duong) which was set up in 1978 using Vietnamese equipment and technology with a capacity of 25,000 tons per annum; in 1990 it was set to produce less than 15,000 tons and at the time of writing was almost at a standstill (only 1 oven out of 5 in use). This is mainly due to energy costs (30% of the cost of production) which rose sharply in November 1990 (the cost of electricity doubled) and to the irregular quality of the product which results in a preference for Bimson cement for reinforced concrete or for lime for ordinary masonry. This factory now employs only less than 400 workers (compared with over 1000 a few years ago). Its equipment is also old and its management staff insufficient.

The same situation pertains to the Lime/stone factory installed in the Commune, which has also severely cut back its activities.

The District stone cutting workshop (a cooperative of 40 workers) has also been closed for two years, due to the lack of a market, (or rather to the failure to match production to a changing market.)

At the same time, a number of small family businesses are being formed for the manufacturing of fine gravel for concrete and roads (capacity 15 - 25 m3/day; investment 4 to 10 M Dong). These employ 10 to 20 workers at higher wages than the Stone cutters (3000 Dongs/day, compared with 1000 Dongs/day). These are often set up by former factory workers who invest, with the help of their families, (with no bank "credits", but only "credits" between individuals), in what could become the main activity of the Commune. At present, however, principally because of the absence of organized credit, financial costs (repayment of personal loans) remain high.

5. Human resources

The Commune has significant human resources, mobilized at all levels:
- Family
* workers qualified for the extraction and processing of stone (masonry, stone carving) and for craft activities in the home (mainly embroidery);
* the capacity to manage small production units (e.g. stone-grinding or agriculture) with good knowledge of potential markets;
- Village/Commune
* participation in work of collective interest for the Commune (900 people for 10 days) and for the District (800 people for 10 days); this covers mainly road maintenance and canal irrigation. This contribution could be rewarded with money or in kind.

6. Economic resources

6.1. Family level

At the level of the family, Section I.2.2 included a table of estimated average family income according to a certain classification. Income is low and the savings made very modest for the "poor" or "medium" families. This data should, however, be interpreted with care, and it is necessary in the future to specify the real "affordability" of each type of family. At the same time surveys (of the built environment) confirm the figures reasonably well, in particular the extreme difficulty in setting aside sufficient savings to build "services" such as latrines or a water tank.

6.2. Commune level

In 1990 the Commune budget is 20 millions Dong

2.1 Income

a) Tax on agricultural production 4,000,000
For the peasants, tax reduced by 50% in 1989 and 1990, or equivalent to %5 of production (in rice). The tax is collected by the Commune, made over to the District, which in turn releases 20% of the total value back to the Commune in Dongs.
b) Tax on industrial/semi-industrial activities (stone, crafts) 6,000,000
New activities are exempt from tax for a few months.
c) Tax on commercial activities 2,000,000
10% of the total, the remaining 90% going tot he District.
d) Tax on the slaughtering of animals 4,000,000
The tax is 10,000 per animal (e.g. pig).
e) Family building tax 4,000,000
3,000 Dongs/family.

To this income should be added:
- work days (900 x 10 days)
- the District subsidy of salaries (50% of medical staff, 100% of education staff)
- the contribution of the population and of factories in buildings (e.g. school).

2.2 Outgoings

a) Salaries and administration 10,000,000
Salaries: 14 people; plus 34 retired and 5 part salaries of medical personnel.

b) Investment 10,000,000
* roads 2,000,000
* irrigation 2,000,000
* building 4,000,000
* training 2,000,000

To these should be added the Commune's contribution to the District for the construction of schools and roads.

The Commune budget is equivalent to approximately 2 US $ per family and does not currently allow any cash investment in important works. The greater part of the budget, however, is the contribution in work of the population (equivalent to 27,000,000 Dongs assuming a rate of 3,000 Dongs/day worked).

6.3. Credit

The Commune has a credit cooperative employing 3 people, under the control of the People's Commune. It currently has 34 members and is handling 23 loans. The cooperative also serves as a counter for the District bank. The cooperative borrows at 4% per month interest and lends at 6% per month; (most loans are small - 50,000 to 1,000,000 Dongs - over 3 to 6 months.) Its total capacity is 5 million Dongs. The structure would allow this capacity to rise to 20,000,000 Dongs.

Resource and capacity mobilization in Ninh Van

Type / Level	*SOCIAL*	*NATURAL*	*BUILT ENVIRONMENT*	*CAPITAL INSTALLATION*	*HUMAN RESOURCES*	*ECONOMIC RESOURCES*
Family Level *Global*	* Mutual help				* 2-3 / family	
Rich			* Stone house * Well, tank, latrine	* Stone production equipment * Rice mills * Ox carts	* Skilled labour : - stone - Construction - Management - Embroidery	Saving (Dongs/year) 1 000 000
Medium			* Stone/block house * Well			<300 000
Poor			* Thatch house * No services		* Unskilled labour	<100 000
Village Level	* Relatives support and help		* Kindergarden * 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 (1700 p. X 10d.) * Low capacity for management	
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		* 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 $/famiy) - Low income from agriculture and stone hand work**

7. Synthesis

The following table summarizes the Commune's resources, showing the main points and the potential to be mobilized.

The Commune has important resources (natural and human) in certain areas, but suffers from a lack of financial capacity in order to be able to develop these.

It should be noted that currently a large part of the Commune's resources are used by higher administrative echelons (Province and District) without any benefit accruing to the Commune.

Classification of actions

N	Action	Beneficiary					
		Family		Village		Commune	
		Liv.cond.	Fam.Income	Liv.cond.	Vill.Eco.	Liv.cond.	Com. Eco.
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.						

III/ Proposed actions / Criteria for choice of technology / Work plan

1. Synthesis and global work plan

In Section I the overall nature and characteristics of the Commune and the main obstacles to the improvement of the living conditions of the population, of family income, of public facilities and of the economy of the Commune were presented.
The main focus of Section I was on issues related to our field of interest, (for example excluding agriculture). Areas which are currently being examined by the NCRPD in others communes were also excluded. For example, the supply of fuel for cooking for several months of the year (typically 2-3) is clearly a problem for the local population, but this issue currently the subject of wide-scale experimentation in Yen Bac Commune; the experience of Yen Bac (e.g. technical data, trained builders, training or information materials) will be used in the future in Ninh Van by the local partners of the programme at provincial level.

Section II reviewed the local resources of Ninh Van, and the capacities of the various actors (i.e. families, the villages, the Commune) and drew attention to the social organization and human resources which make up an important aspect of rural development.

Drawing together the observations of Section I and Section II allows various actions to be proposed, relating to the different levels identified and with different objectives. The following table classifies these proposed actions according to the target beneficiaries.
Together the proposed actions (numbered 1-11) make up the framework of Action number 12, which constitutes the key objective of the programme (i.e. the replicability of actions at local level).

For each proposed action, certain criteria for the correct choice of a given technology have been put forward; in summary these are as follows:

- technical viability,
- economic affordability,
- social acceptability.

Throughout the programme, these criteria will constitute a point of reference allowing the evaluation of solutions put forward and enabling only those which provide a genuine response to a given problem and which are replicable on a wider scale to be selected.

Each proposed action is accompanied by a working plan, showing the main phases (i.e. PHASE II : Research/Application; PHASE III : Evaluation).

The duration of each phase will depend on the nature of the action concerned: for example, road construction requires a significant labour force, available only after the rainy season.

Ninh Van work plan / 1991

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

Global Working Plan

The actions programmed are intended to take particular account of the following 3 points which have up till now been neglected in the earlier interventions of the NCRPD.

(a) The technological solutions proposed must take very precise account of local conditions within the Commune and must clearly address the various priorities described in Sections I and II. Thus solutions appropriate to Ninh Van are not necessarily reproducible in other Communes within the same Province: for example, stone happens to be a building material which is readily available and cheap in Ninh Van, but this is not the case elsewhere. It is therefore of fundamental importance to develop at local level the technical capability and a working method which will enable future responses to problems for which the solutions will vary from one area to another.

(b) The preceding interventions of the NCRPD in other Communes have shown insufficient vigilance in monitoring costs and spending, notably the budgeted costs of an activity compared with exact actual costs (including the additional costs linked to experimentation). Thus for each action proposed, strict control of estimated costs will be exercised at the research stage, thus testing real local financial capabilities. Pilot applications will also be closely monitored to identify where possible savings might be made and how spending is distributed (e.g. to the family economy, the village, the Commune, or exterior to the Commune.)

(c) The beneficiaries of pilot actions are either individuals (i.e. families), or collectivities (such as groups of families, the village, or the whole Commune). The choice [of beneficiary?] is particularly important for the evaluation and replicability of the actions and should be made taking account of:
- local disparities and disparities between actual target groups;
- the potential and capability for serving as "demonstration";
- the "motivation" of the beneficiaries and their contribution (financial or in work)
and should have the support of:
- Commune leaders
- local organizations (e.g. women's organization, eduction and health service organizations, traditional organizations including village organizations etc.)
- the reactions and opinions of those directly involved and of others around them.

2. Proposed actions 1-12

Problem : PROBLEMS IDENTIFIED IN HOUSES : STONE WALLS, ROOFS (TYPHOONS) OPENINGS & FLOORS

Objective : IMPROVE QUALITY & COMFORT — WORK ON BUILDING MATERIALS & TECHNIQUES
Beneficiary : POPULATION
Action : HOUSING IMPROVEMENT

Criteria for choice of technology

Stage / Criteria	STONE WALLS	ROOFS	OPENINGS	FLOOR
Technical	• EXISTING MASONRY : STONE BLOCKS + 40% MORTAR	• REDUCE EFFECT OF TYPHOONS ON ROOF - DIAGONAL BRACING STRUCTURE - RIBS ON ROOF COVERING - TIE TILES TO BATTENS SEE DOCUMENTATION PROJECT VIE/85/019 IHPBD / IBD	. DESIGN APPROPRIATE WOOD SHUTTERS & NYLON / BAMBOO WINDOW FOR PRIMARY SCHOOL	• EXPERIMENT ON FLOORS - COMPACT EARTH - LIME + STONE DUST + CEMENT
Viability	• DEFINE MODULAR SYSTEM EASY TO HANDLE AND TO BUILD WITH		• SHUTTERS FOR TYPHOON • WINDOW FOR RAIN AND COLD BUT KEEPING LIGHT	•
Economical	• CALCULATE COST OF WALLS M^2 - BLOCK - MORTAR - LABOUR COMPARE BLOCK TO LIME BRICK TO TRADITIONAL STONE TO DRESSED STONE IS COST REDUCED OR NOT ?	• CALCULATE EXTRA COST FOR TYPHOON STRENGTHENING		• DETERMINE COST M^2 FLOOR / CEMENT TILES
Affordability	• BALANCE B. MATERIALS / LABOUR COMPARE < LOCAL COST / NATIONAL COST			
Social	• TRAIN MASONS FOR DRESSED STONE WORK	• TRIALS ON EXISTING BUILDINGS WITH TRAINING SESSIONS FOR BUILDERS		TRIAL ON PUBLIC BUILDING
Acceptance				
Key points	COST SKILLED LABOUR	• EXTRA COST • TRAINING	• DESIGN • MAINTENANCE	• DURABILITY

Work plan : PHASE I - DESIGN 2 MONTHS
PHASE II - PILOT EXPERIMENTATION 2 MONTHS
* SELECT TEST HOUSE OR PUBLIC BUILDING
* INTRODUCE TECHNIQUES WITH TRAINING MATERIALS

PHASE III - EVALUATION & DIFFUSION OF RESULTS 2 MONTHS

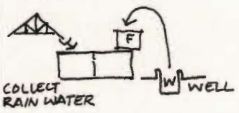
Problem : SUPPLY OF CLEAN WATER IS MAIN PROBLEM IN DRY SEASON. ONLY 2690 FAMILIES USE A WATER TANK (MAINLY FOR COST REASONS)

Objective : EXPERIMENT AN IMPROVED SYSTEM AFFORDABLE BY ALL FAMILIES (POOR/MEDIUM)

Beneficiary : FAMILY

Action : WATER FILTER / TANK

Criteria for choice of technology

Stage / Criteria	DESIGN	CONSTRUCTION PILOT APPLICATION	MAINTENANCE
Technical **Viability**	• SYSTEM  • AVERAGE USE OF WATER 100 L/DAY • QUALITY : STANDARD • USE LOCAL BUILDING MATERIALS = STONE = BRICKS	BUILT • BY LOCAL BUILDERS	• MUST BE EASY TO MAINTAIN – CLEANING FILTER AND TANK
Economical **Affordability**	TOTAL COST <3 MONTH'S INCOME	BUDGET : - 50% PROJECT :- 50% USER	
Social **Acceptance**	• AIM TO IMPROVE LOCAL SYSTEMS (ex: for collecting water : for filtration) • PREPARE A PROGRAMME WITH EDUCATION & HEALTH SERVICES • SELECT FAMILIES WITH WOMENS ORGANIZATIONS	• ORGANIZE MEETING WITH NEIGHBOURHOODS	• BY FAMILY
Key points	CAPACITY / COST	FINISHING	SIMPLICITY

Work plan : PHASE 1. DESIGN 3 MONTHS

* DETAILED ANALYSIS OF WATER (QUALITY/QUANTITY) USE BY FAMILIES IN NINH VAN → CAPACITY OF TANK + FILTER
* RESEARCH INTO TECHNICAL SOLUTIONS WITH COST ESTIMATES
* PREPARE GUIDELINES FOR CONSTRUCTION (MANUAL)

PHASE II – CONSTRUCTION 1 MONTH * 2/3 PILOT FAMILIES CHOSEN → CONSTRUCTION

PHASE III 6 MONTHS.

* EVALUATION OF SOCIAL ACCEPTANCE & MEANS OF DIFFUSION

Problem : LESS THAN 30% OF NINH VAN INHABITANTS USE LATRINES (OF THESE 75% ARE IN BAD CONDITION)
PROBLEMS ARE TECHNICAL (FLOODING; REUSE OF WASTE), ECONOMICAL (COST = 3-4 x MONTHLY INCOME)
SOCIAL (POPULAR EDUCATION). BUT MANY PROJECTS EXIST IN VIETNAM

Objective : IMPROVE SANITARY CONDITIONS

Beneficiary : POPULATION

Action : LATRINES IMPROVEMENT

Criteria for choice of technology

Stage / Criteria	DESIGN	PILOT APPLICATION	EVALUATION / DIFFUSION
Technical **Viability**	• SPECIFICATIONS - FOR 1 OR MORE FAMILIES - HIGH WATER TABLE - WASTE TO BE RE-USED (?) - CAN USE STONE - OPTION OF CLEANING WITH OR WITHOUT WATER TO BE INVESTIGATED	• TRY OUT 3-4 IN DIFFERENT VILLAGES • BUILD BY LOCAL BUILDERS	USE DURING 3-4 MONTHS
Economical **Affordability**	• TOTAL COST SHOULD BE LESS THAN 2-3 MONTHS INCOME (AIM AT POOR FAMILIES)	• BUDGET 50% PROJECT 50% FAMILY	
Social **Acceptance**	• ADAPT TO LOCAL HABITS & TRADITIONS • PREPARE ACTION WITH EDUCATION & HEALTH SERVICES - POEMS - • SELECT FAMILIES WITH HELP OF WOMEN'S ORGANIZATION FOR TRIAL APPLICATION	• DEMONSTRATION • MOBILIZE POPULATION THROUGH LOCAL ORGANIZATIONS AND SERVICES	• ANALYSE IN DETAIL RESISTANCE OR ACCEPTANCE • PREPARE TOOLS/MEDIA FOR WIDE DIFFUSION
Key points	LOCAL FACTORS water; habits	CHOICE OF FAMILIES MOBILIZATION	SOCIAL ACCEPTANCE

Work plan : PHASE I DESIGN 2 MONTHS
* CAREFUL ANALYSIS OF LOCAL CONDITIONS + TRADITIONS
* REVIEW ALL TECHNICAL SOLUTIONS + CHOOSE A SYSTEM / TECHNICAL - COST ESTIMATE / GUIDELINES FOR BUILDING
* MOBILIZE LOCAL FAMILIES + ORGANIZATIONS

PHASE II PILOT APPLICATION 2 MONTHS
* EDUCATION CAMPAIGN

PHASE III EVALUATION / DIFFUSION 6 MONTHS

Problem : EXTENSION OF COMMUNE TO WEST - RECLAIM NEW LAND AREA

Objective : ORGANIZE THE SETTLEMENT OF ABOUT 100 FAMILIES (200 IN 10 YEARS)
Beneficiary : POPULATION / COMMUNE
Action : NEW SETTLEMENT PLANNING

Criteria for choice of technology

Stage / Criteria	DESIGN	IMPLEMENTATION	
Technical **Viability**	• ELIMINATE RISK OF FLOODING & PREVENT STORM EFFECTS • IMPROVE WATER + SANITATION SYSTEMS + COMMUNICATION / ACCESS • REDUCE STANDARDS FOR ROADS / STREETS FOR ECONOMY • ESTABLISH VIABLE PLOT SIZE	• TECHNICAL SUPERVISION BY DISTRICT / COMMUNE WITH NCRPD SUPPORT	
Economical **Affordability**	• PRELIMINARY STUDY ON SITE 1½ MONTH BY ARCHITECT / SOCIOLOGIST	BUDGET - 40% COMMUNE - 20% C. NINH HAI - 40% OTHERS	
Social **Acceptance**	• PARTICIPATION OF INHABITANTS • RESPECT TO LOCAL HABITS - PRIVATE / SEMI PRIVATE & PUBLIC SPACES - SIZE OF PLOTS & FAMILY ACTIVITIES • RULES FOR PLOT ALLOCATION	• TRAIN TECHNICIANS	
Key points	PARTICIPATION OF FUTURE USERS	BUDGET	

Work plan :

PHASE I DESIGN — 3 MONTHS
* PRELIMINARY STUDIES (2 WEEKS IN NINH VAN)
* SET UP POPULAR PARTICIPATION ACTIVITIES (MEETINGS / WORKING GROUPS...)
* COOPERATION : NINH VAN / NINH HAI / DISTRICT FOR FUNDING

PHASE II IMPLEMENTATION — 3 MONTHS
* SUPERVISION + MONITORING

PHASE III EVALUATION - 5 MONTHS

Problem : THE NEW SETTLEMENT HAI NHAN IS NOW ISOLATED - ROAD IS CLASS 5 (BIKES)
NO BRIDGES OVER SMALL CANALS.
MAIN PRIORITY IN COMMUNE IS ROAD SYSTEM

Objective : IMPROVE ROAD FROM CLASS 5 TO CLASS 4 (OXCARTS) OR CLASS 3 (LORRIES FOR STONE EXPORT)

Beneficiary : POPULATION + COMMUNE

Action : BUILD ROAD BETWEEN PRISON + HAI NHAN - 1050 M + 500 M

Criteria for choice of technology

Stage / Criteria	DESIGN	CONSTRUCTION	MAINTENANCE
Technical **Viability**	• DESIGN SUBJECT TO CLASS CHOICE 4 OR 3 - ECONOMIC FEASIBILITY • CLASS 3 OR 4 - BRIDGES WITH STONE VAULTS SPAN 2-4 METRES • ROAD SURFACE EARTH / STONE / GRAVEL • EXPERIMENT EQUIPMENT ADAPTED TO LOCAL CONDITIONS SEE ACTION 7 • IMPROVE TOOLS FOR MASONRY	BUILD BY LOCAL MASONS (BRIDGE) LOCAL WORKERS (ROAD	- EASY & RAPID MAINTENANCE SEE ACTION 7
Economical **Affordability**	- ESTIMATED COST OF CONSTRUCTION - 3 = 15000 Dong / m² 4 = 10000 Dong / m² 50% MATERIALS 50% LABOUR COMPARE CLASSES • BENEFIT - COMMUNE ~ INVESTMENT ECONOMY SEE ACTION 11 • LOCAL CAPACITY - COMMUNE - DISTRICT FOR LABOUR		< 100 Dong / m² or 100 gm rice / m²
Social **Acceptance**	• LABOUR FORCE AVAILABLE OCTOBER - DECEMBER • DEVELOP SKILLED LABOUR FOR MASONRY BRIDGE		< 1 m/day/m²
Key points	ECONOMIC FEASIBILITY	MOBILIZATION	REGULAR MAINTENANCE

Work plan :

PHASE I - RESEARCH 8 MONTHS
* FEASIBILITY STUDY COMPARE 2 SOLUTIONS + ECONOMICS OF TRAFFIC CAPACITY
* RESEARCH STONE BRIDGES (EXPERIENCE IN NINH VAN) - SKILLS / TOOLS
* ORGANIZATION - SUPERVISER; TEAM; + TRAINING WITH MATERIALS/MANUALS
* FUND RAISING

PHASE II CONSTRUCTION 2 MONTHS
* ORGANIZE
* SUPERVISE BY NCRPD + LOCAL TRAINED PEOPLE

PHASE III EVALUATE 2 MONTHS — COMMUNICATION MATERIALS

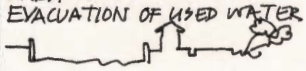
Problem : MORE THAN 50% OF POPULATION USED VILLAGE WELLS IN NORTH OF NINH VANH.
QUALITY: MEDIUM MAINTENANCE: BAD

Objective : IMPROVE PUBLIC SERVICE IN THE VILLAGE (WITH WASHING AREA); SUPPORT TO LOCAL STONE PRODUCTION

Beneficiary : VILLAGE

Action : VILLAGE WELL IMPROVEMENT

Criteria for choice of technology

Stage / Criteria	DESIGN	CONSTRUCTION	MAINTENANCE
Technical **Viability**	• IMPROVE ACCESS TO VILLAGE WELL + DESIGN A WASHING AREA WITH ROOF + WITH EVACUATION OF USED WATER  • BUILDING MATERIALS: STONE • PUMP/FILTER IF NEEDED	• BY LOCAL MASONS (HIRED) AND MUTUAL HELP	• EASY FOR VILLAGE (OR GROUP OF FAMILIES)
Economical **Affordability**	• TOTAL COST C < 3 000 000 Dong	• BUDGET PARTICIPATION VILLAGE 30% COMMUNE 40% OTHERS (DISTRICT; PROJECT) 30%	
Social **Acceptance**	• DESIGN ADAPTED TO LOCAL HABITS FOR WASHING (Collective/family/seasonal habits/women) • CHOICE OF VILLAGES MADE WITH WOMEN'S ORGANISATION		
Key points	IMPROVE QUALITY	QUANTITY OF STONE MASONRY	REGULAR MAINTENANCE

Work plan :

Problem : GLOBAL ROAD SYSTEM IN BAD CONDITIONS. USUAL MAINTENANCE BY COMMUNE & CONTRACTOR WITH LOW BUDGET (COMMUNE 2 MILLION DONG/YEAR)

Objective : IMPROVE THE EQUIPMENT / ORGANIZE A MAINTENANCE SYSTEM

Beneficiary : COMMUNE

Action : ROAD MAINTENANCE SYSTEM & EQUIPMENT.

Criteria for choice of technology (SEE ALSO 4 & 11

Stage / Criteria	DESIGN	ORGANIZATION	APPLICATION
Technical **Viability**	◦ RESEARCH ON ADAPTED TOOLS & EQUIPMENT FOR DIFFERENT CLASS ROAD: 2,3,4,5 - ROLLERS - GR - MANUAL COMPACTER ◦ BUILDING MATERIALS ADAPTED TO EACH CASE ◦ EQUIPMENT - LOCAL MAINTENANCE - LOW RUNNING COST - UNSKILLED LABOUR • IDENTIFY CAPACITY NEEDED	◦ "MAINTENANCE NOTE BOOK" Guide giving description of every action / step. ◦ PERMANENT TEAM (Supervisor + 2 workers) IN CHARGE OF MAINTENANCE.	
Economical **Affordability**	◦ INITIAL INVESTMENT 10 – 12 million Dongs ◦ CONTRIBUTION from project < 60% ◦ EQUIPMENT MUST ALLOW COMMUNE TO MAINTAIN ALL ROADS IN CONDITION WITH THE SAME COSTS (< 100 D/m² in 1990) and LABOUR (< 0.2 working days/m²) ◦ EQUIPMENT COULD BE LOANED TO OTHER COMMUNES		
Social **Acceptance**	◦ LOCAL MANAGEMENT OF EQUIPMENT	◦ ORGANIZATION / MOBILIZATION UNDER CONTROL OF - P.C - VILLAGE ◦ LABOUR FORCE AVAILABLE AFTER RAINY SEASON (OCT – DEC) ◦ LOCAL SUPERVISER TRAINED	◦ CONTROL OF ORGANIZATION ◦ "MATERIALS" (MEDIA/KIT) FOR DIFFUSION IN OTHER COMMUNES.
Key points	EQUIPMENT — CAPACITY & COST	MAINTENANCE TEAM	REPLICABILITY

Work plan :

PHASE I – RESEARCH – ORGANIZATION – 8 MONTHS
* RESEARCH & SELECTION OF ADAPTED EQUIPMENT
* PREPARATION OF "MAINTENANCE NOTE BOOK"
* TRAINING OF LOCAL SUPERVISER
* INFRASTRUCTURE - BUILDING MATERIALS
* PREPARATION OF MANUALS/INSTRUCTION

PHASE II – IMPLEMENTATION – 3 MONTHS
PRACTICAL ORGANIZATION OF ROAD MAINTENANCE

PHASE III – FOLLOW UP. / EVALUATION

Problem : THE LOCAL & FAMILY ECONOMY SUFFERS FROM A LACK OF AVAILABLE CREDIT (WITH ANNUAL INTEREST) WHICH WOULD ALLOW INVESTMENT IN SMALL SCALE ENTERPRISES & HANDYCRAFTS

Objective : SET UP ADAPTED SYSTEM FOR SMALL LOANS (< 3 000 000 Dongs)

Beneficiary : COMMUNE / FAMILIES

Action : CREDIT SYSTEM.

Criteria for choice of technology

Stage / Criteria	INFORMATION	FEASIBILITY	APPLICATION
Technical **Viability**	◦ REVIEW EXISTING SYSTEMS IN VIETNAM (BOTH TRADITIONAL AND CURRENT) AND THOSE USED IN SIMILAR COUNTRIES ABROAD FOR CREDIT IN RURAL AREAS	◦ DEFINE A SYSTEM WELL ADAPTED TO - FAMILIES (MEDIUM INCOME) - SMALL LOANS 100 000 D/ 3 months - MEDIUM LOANS 300 000 D/ year - SAVING (short/long term) - absence of formal guarantees/collateral. (SEE GRAMEEN BANK CASE STUDY)	• ESTABLISH LOANS • MONITORING BY NCRPD.
Economical **Affordability**	◦ ASSESS PAY BACK POTENTIAL	◦ ECONOMIC VIABILITY ◦ ASSESS REAL IMPACT ON LOCAL ECONOMY • INITIAL INVESTMENT 20 000 000 Dongs Contribution by PROJECT 50%	
Social **Acceptance**	IDENTIFY IN THE COMMUNE THE TYPE & SIZE OF LOANS DESIRED + REALISTIC	◦ ESTABLISH LOCAL CAPACITY TO MANAGE THE SYSTEM - use CREDIT COOPERATIVE? - ESTABLISH NEW INSTITUTION ? ◦ TRAIN LOCAL RESPONSABLES (OVERSEAS + LOCAL TRAINING)	
Key points	PVT ECONOMIST IN NCRPD STAFF	INTEREST LEVELS GUARANTEE METHODS	BENEFICIARY MOTIVATION

Work plan :

PHASE I - PREPARATION - 3 MONTHS
* CONTACT VIETNAMESE INSTITUTIONS ALREADY INVOLVED IN RURAL DEVELOPMENT (Rural Banks, social funds)
* REVIEW OVERSEAS EXPERIENCE
* FEASIBILITY STUDY FOR NINH VAN
* TRAIN LOCAL MANAGEMENT

PHASE II APPLICATION - 9 MONTHS & ONGOING
* IMPLEMENT SYSTEM → ONGOING MONITORING

Problem : STONE IS THE MAIN RESOURCE IN THE COMMUNE FOR INDUSTRIES/HANDICRAFTS. DIFFERENT PRODUCTS: STONE FOR BUILDING, GRAVELS FOR ROADS, STONE QUARRYING, STONE CUTTING LIME, CEMENT — WORK IS USUALLY HARD, LARGE FACTORIES CLOSED/NOW SMALL ENTERP

Objective : SUPPORT SMALL SCALE ENTERPRISES FOR GRAVEL PRODUCTION

Beneficiary : FAMILY ECONOMY, COMMUNE

Action : STONE PRODUCTION

Criteria for choice of technology

SEE ALSO FICHES 4 / 7 / 11

Stage / Criteria	ANALYSIS OF EXISTING SMALL ENTERPRISES	RESEARCH ON EQUIPMENT/ENTERPRISES	SUPPORT TO BUSINESSES
Technical **Viability**	○ REVIEW EQUIPMENT (GRINDER) - ORIGIN - RELIABILITY - MAINTENANCE - QUALITY OF PRODUCTS - ENERGY/FUEL CONSUMPTION - INPUTS/OUTPUTS - TRANSPORT OF MATERIALS	○ SPECIFICATIONS FOR GRINDER - INCREASE PRODUCTIVITY IN OVERALL CHAIN. - ADAPT FOR DIFFERENT SIZES OF STONE - REDUCE ENERGY CONSUMPTION - ORGANIZATIONS OF SUPPLY LINE/SITE.	
Economical **Affordability**	○ DETAILED PRODUCTION COST BREAKDOWN - INVESTMENT (LOANS?) - RUNNING COSTS - RAW MATERIALS - ENERGY - LABOUR - PROFITS - TAXES Investment - Jobs created	○ FEASIBILITY STUDY - INVESTMENT cost PRODUCTION cost ○ AVAILABILITY OF CREDIT - INVESTMENT PER JOB 500 - 1000 000 Dong/place	
Social **Acceptance**	○ EVALUATE LOCAL MANAGEMENT AND ORGANIZATION, SKILLED LABOUR, WORKERS SALARIES ○ MARKET ANALYSIS	○ TRAIN MANAGER	
Key points	LOCAL MANAGERS	INVESTMENT/JOB RATIO	SUPPORT TO MANAGERS

Work plan :

PHASE I — ANALYSIS - 1 MONTH

* ANALYSIS OF ENTERPRISES IN NINH VAN
* SURVEY OF EQUIPMENT AVAILABLE (from NINH VAN; CHINA, etc...)

PHASE II — RESEARCH — 4 MONTHS

* RESEARCH ON EQUIPMENT / INNOVATIONS / FEASIBILITY

PHASE III APPLICATION - EVALUATION — 6 MONTHS

Problem : MARKET – IMPORTANT ACTIVITY (EVERY 2 DAYS, ~100 SELLERS) DIFFICULTIES INCLUDE ACCESS EXTENSION AND CONDITIONS DURING RAINY SEASON

Objective : IMPROVE TRADE ACTIVITY & COMMUNE REVENUE

Beneficiary : COMMUNE - POPULATION

Action : IMPROVE COMMUNE MARKET

Criteria for choice of technology

Stage / Criteria	DESIGN	CONSTRUCTION	OPERATING MAINTENANCE
Technical **Viability**	◦ SHELTERS FOR ± 100 SELLERS FOODSTUFF & HANDICRAFTS ◦ USE LOCAL RESOURCES (STONE) AND (RE) INTRODUCE SUITABLE RELATED TECHNIQUES (ie PILLARS) ◦ ORGANIZE ACCESS (parking; Bikes; Oxcarts) ◦ ASSURE WATER SUPPLY (river) AND SANITATION	◦ BUILD BY LOCAL HIRED SKILLED MASONS WITH SUPERVISION BY NCRPD	◦ EASY CLEANING WITH WATER
Economical **Affordability**	◦ BUDGET - COMMUNE 30% - USERS 30% - TRADE COOP 20% - PROJECT 20% ◦ REVISE TAX SYSTEM (Now nearly 10% for Commune - increase to 50% Commune 50% District		TAX DISTRIBUTION INCREASE TO COMMUNE - 50%
Social **Acceptance**	◦ DESIGN ADAPTED TO DIFFERENT TYPES OF PRODUCE & LOCAL HABITS (size, character, durability) ◦ EXTEND ACTIVITIES TO HANDICRAFTS (stone etc)		◦ INCREASE - VOLUME OF GOODS SOLD - QUALITY OF GOODS SOLD
Key points	LOCAL CAPACITY TO FUND STONE USED	SKILLED LABOUR SUPERVISION	COMMUNE INCOME INCREASED

Work plan :

PHASE I – DESIGN – 2 MONTHS
- * ARCHITECTURAL PROGRAMME - ACTIVITIES/AREAS/ ORGANIZATION
- * TECHNICAL SOLUTIONS + COST ESTIMATE – USES STONE

PHASE II – CONSTRUCTION 4 MONTHS
- * SUPERVISION / MONITORING COSTS

PHASE III OPERATING FOLLOW UP – 2 MONTHS

Problem : THE SOUTH PART OF THE COMMUNE IS ISOLATED FROM TAM DIEP DISTRICT (ROAD CLASS 5). IMPORTANT STONE RESOURCES (VAN LE VILLAGE) CANNOT BE EXPLOITED NOW BECAUSE OF TRANSPORT DIFFICULTY

Objective : IMPROVE ROAD (CLASS 2 OR 3) FOR EXPORTING STONE PRODUCTS TO T.D. DISTRICT

Beneficiary : COMMUNE – STONE PRODUCTION

Action : DEVELOP ROAD VAN LE / TAM DIEP (1500m)

Criteria for choice of technology

Stage / Criteria	DESIGN	CONSTRUCTION	MAINTENANCE
Technical **Viability**	◦ ROAD CLASS 2 OR 3 (LORRIES) IN FLOODABLE AREA ◦ USE LOCAL MATERIALS (stone, lime, earth from excavation) ◦ RESEARCH + TEST ROLLER EQUIPMENT ~ local roller ~ grinders	◦ CONSTRUCTION OVER A SHORT PERIOD 2 – 3 MONTHS	◦ LOCAL MATERIALS ◦ LOCAL RESOURCES
Economical **Affordability**	◦ FEASIBILITY – TOTAL INVESTMENT C – BENEFIT TO COMMUNE – TAX STONE (Benef. Com = BC) – BENEFIT TO LOCAL ECONOMY (transport, production, building) Benef. Eco = BE $\frac{BC + BE}{C} = > 10\%$ ◦ C = 40% COMMUNE 40% DISTRICT HOA LU 20% OTHERS T. DIEP. ◦ C = Dong / m²	COST < 15 000 Dgs/m²	COST < 100 Dgs/m²/year
Social **Acceptance**	◦ LABOUR FORCES AVAILABLE IN OCT → DEC	◦ ORGANIZATION OF WORKS WITH LOCAL TRAINED SUPERVISER (COMMUNE/DISTRICT LEVEL) ◦ PEOPLES PARTICIPATION	LABOUR < 1 workday/m² per year
Key points	ECONOMIC INTEREST	ORGANIZATION	ORGANIZATION COST

Work plan :

PHASE I – DESIGN ORGANIZATION – 3 MONTHS
- * ECONOMIC FEASIBILITY
- * RESEARCH ON EQUIPMENT (see also actions 5+7)

PHASE II – CONSTRUCTION
- * PRODUCTION OF MATERIALS – CONSTRUCTION / SUPERVISION

} In 1991 subject to capacity to fund

PHASE III – EVALUATION
- * manual for roads construction

Problem : THE OBJECTIVE OF THE PROJECT IS NOT ONLY TO IMPLEMENT SEVERAL 'PRODUCTS' BUT ALSO TO CREATE OR DEVELOP A CAPACITY AT LOCAL LEVEL (PROV/DIST/COMMUNE) TO GIVE TECHNOLOGICAL SUPPORT TO THE COMMUNE.

Objective :

Beneficiary : LOCAL INSTITUTIONS

Action : DEVELOP LOCAL CAPACITY TO SUPPORT COMMUNES FOR RURAL DEVELOPMENT (SEE DIAGRAMME)

Criteria for choice of technology

Stage / Criteria	IDENTIFICATION	TRAINING	MONITORING
Technical **Viability**		◦ PREPARE TRAINING MATERIAL (for identification + choice of technology) ◦ EVALUATE PILOT APPLICATIONS ◦ DEVELOP TECHNIQUES ◦ ORGANIZE WORKSHOPS IN PROVINCE (with case studies)	◦ FOLLOW UP + EVALUATION OF ACTIVITIES AT ALL LEVELS ◦ ADAPT AS NECESSARY ANY TRAINING MATERIALS
Economical **Affordability**		• COST FOR ORGANIZING WORKSHOP → PROJECT • COST FOR PILOT APPLICATION → USERS → PROJECT	
Social **Acceptance**	◦ IDENTIFY PROVINCIAL TEAMS (M.O.C; Others) ◦ IDENTIFY DISTRICT TECHNICIAN • IDENTIFY LOCAL NETWORK	• RELATIONS: PROVINCE ↓↑ DISTRICT ↓↑ COMMUNE ↓↑ VILLAGERS ↓↑	◦ DEVELOP EXCHANGE BETWEEN DIFFERENT LEVELS
Key points	PROVINCIAL TEAM	TRAINING MATERIALS	EXCHANGE NETWORK

Work plan :

PHASE I - IDENTIFICATION 2 MONTHS

PHASE II - TRAINING 6 MONTHS

PHASE III - MONITORING 4 MONTHS

3. NCRPD Specialists

The global workplan for Ninh Van commune (Actions 1-12) indicates for each action the input required from the NCRPD, and the relevant skills necessary. The total input represents nearly 45 man-months, as previously indicated in the Inception Report approved by the Director of the Project and the UNCHS CTA.

The functions of each specialist required are described below :

a/Coordinator

- To coordinate all the actions undertaken within the Commune of Ninh Van, under the authority of the Director of the Project, and acting as the principal counterpart to the Project Subcontractors.

b/Building materials specialist

- To prepare specific actions and assist other technicians in the preparation of actions, including the use of building materials.

c/Communication specialist

- To define a global strategy for communications emanating from the NCRPD (e.g. the style of publications, the presentation of documents, the use of logos etc.)
- To participate in actions in order to define, for each particular case, the appropriate means of dissemination of information and communication (including target groups, objectives, use of traditional media etc.)
- To prepare, with specialist external support as necessary (e.g. for video), the communication tools used in the project and materials for the training of local partners.
- To evaluate these means of communication and adapt them for a wider use.

d/Water supply/sanitation expert

e/Transport/Roads expert

f/Economy-Finance specialist

- To train NCRPD staff (and local partners) in the functioning of the family economy, the main features of the Commune budget, the use of traditional loans etc.
- To participate in economic feasibility studies (for example on roads, credit systems etc.)
- To give advice on fund raising and on the economic management of solutions applied .

g/Sociologist

- To train NCRPD staff in techniques for analysis of social inter-relations in rural areas, of local capacities of the various actors (e.g. local authorities, popular organizations etc.), of rural traditions (for example mutual help or relations between families in the village.)
- To train NCRPD staff in field enquiries (including methodology and interpretation of results).

h/Community worker

- To assist NCRPD staff with the organization of popular participation (decision-making) and with the mobilization of the population for specific actions.

i/Architect-Planner

- To contribute to certain specific actions (e.g. the design of a village well).
- To participate in the development of local capabilities (e.g. training, monitoring etc.)

j/Mechanical engineer

- To contribute to specific actions particularly relating to equipment (for road construction and maintenance, stone production etc.)

k/Management specialist

- To train and organize local managers (of small enterprises)

Annex 1 : Methodology

Methodology: phased action in each commune

1. The proposed overall programme

The DW/GRET technical proposal of April 1990, subsequently accepted by UNCHS Habitat, outlined a programme based on a sequence of phases for the identification of needs, resources and potential solutions, and the subsequent transfer of selected actions to solve identified problems. Each of these phases was to be repeated in three pilot communes (B1, B2 & B3). Through the repetition of this sequence of actions, skills would be developed and staff trained, both at the level of the Hanoi based Centre for Rural Planning and Development (NCRPD) and the Centre for Appropriate Technology Transfer in Construction (CATTIC), and, equally important, at provincial and district level.

The overall sub-contract programme divides into four main phases. Phase 1 is also divided into two sub-phases. Training is regarded as an ongoing activity in every phase.

These overall phases are as follow:

Phase 1. A. Evaluation of Group A commune activities.

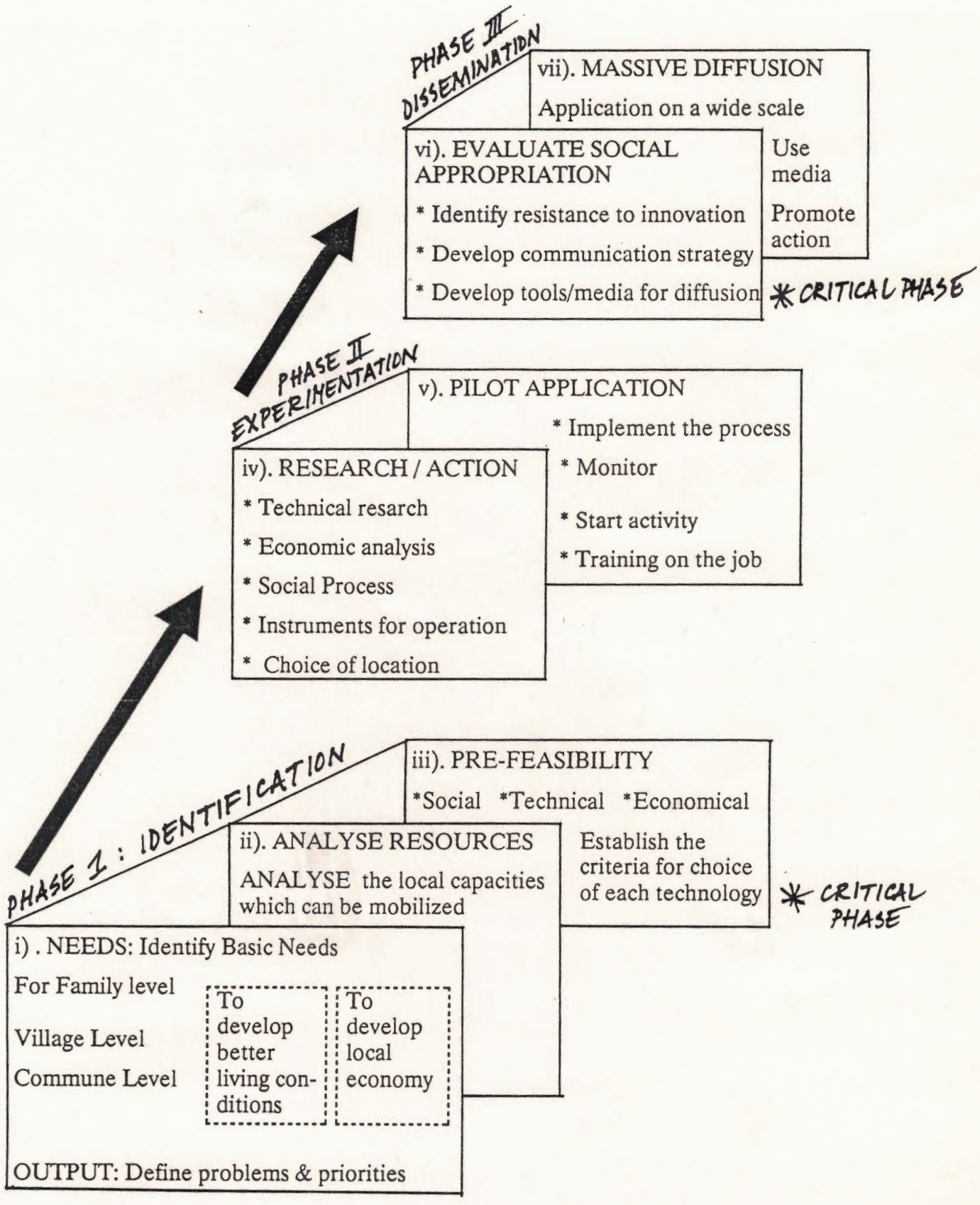
Phase 1. B. Identification: needs and resources analysis and feasibility analysis in Group B Communes.

Phase 2. Experimentation: selection and field testing of appropriate techniques to solve identified problems.

Phase 3. Dissemination: communal widespread application of techniques.

Phase 4. Evaluation of overall programme and dissemination of project conclusions and results.

Diagramme of phases of action and methodology



2. Phased action in the B Group communes.

In practice, for each of the B group communes, activity covers only three of these phases: Phase 1B (Identification), Phase 2. (Experimentation), and Phase 3. (Dissemination).

In turn, each of these three phases includes several steps. They are shown in the diagramme opposite and described below. The fourth phase, "Evaluation of overall programme and dissemination of results", will be a general activity concerning the whole sub-contract, and will be undertaken by the NCRPD with the consultants at the end of the contract period.

2.1. Phase 1B Identification.

This phase includes three stages of action: (i) Needs; (ii) Resources; and (iii) Pre-feasibility.

i). NEEDS.

Objective: Basic needs identification at family, village and commune level. The identification of needs is divided into:

(a) needs to directly develop better living conditions;

(b) needs to develop the local economy.

Method: Enquiry based on household interviews, observation, and discussion/interviews with authorities, enterprises and producers. Analysis of markets and activities.

Results: Define priorities and main problems at family, village and commune level.

Output: Illustrated report on needs and problems and current practices in the commune (in English and Vietnamese).

ii). RESOURCES

Objective: identification of resources (human, material and financial) which can be mobilized for resolving problems in the commune.

Method: Enquiry based on household interviews, observation, and discussion/interviews with authorities, enterprises and producers and transporters; visual survey of resources.

Results: Classification of resources and capacities which can be mobilized at the family level (making distinction between rich, medium and poor families), at village level, and at commune level. Classification of resources by type (and quantity): social; natural; built environment; capital installation; human resources; and economic resources.

Output: Illustrated report on resources and capacities for each commune (in English and Vietnamese).

iii). PRE-FEASIBILITY

Objective: Prepare the performance specification for identified actions which can resolve (or help to resolve) the identified needs with the resources and capacities which are available and / or could be mobilized.

Method: Comparative review of needs and resources: assessment of economic affordability, social process and acceptability, and technical viability.

Result: Production of detailed list of performance criteria for the selection of each type of action, whether the action concern technology, organization, finance or all three.

Output: For each identified problem, a dossier in English and Vietnamese listing the criteria on which a technology or action will be chosen, with detailed list of resources which can be used, and description of the problem which is to be solved, and who (in detail) the target group and beneficiaries will be.

2.2. Phase 2. EXPERIMENTATION

This phase has two parts: (iv) Research / Action; and (v) Application.

iv). RESEARCH / ACTION

Objectives: for each of the identified fields of action, select the exact technical, organizational and financial method and necessary equipment to implement the action in the commune and to meet the performance criteria set in Phase 1/iii Pre-feasibility.

Method: staff to undertake a series of actions, in each case referring to the performance criteria. For different problems and actions, the time taken to complete this phase of activity will vary, and may be short or long. In each case, local partners (builders, technicians, health workers, material producers etc.) from the district and commune should be involved and consulted as much as possible, both to contribute to the development of ideas and for ongoing assessment of viability.

The actions are:

- undertake technical research to identify what techniques, skills and technologies exist (a) locally in the neighbourhood of the commune, (b) nationally elsewhere in Vietnam, and (c) internationally (if nothing available in Vietnam) which can meet the performance criteria; establish first shortlist of potential actions;

- undertake a detailed economic analysis of selected potential actions or technologies including capital and operational costs, and likely distribution of benefits (if any); establish second shortlist, eliminating those techniques which are not economically viable;

- undertake analysis of the social process for operating/using each potential action, including analysis of benefits and likely social resistance to the proposed action; on the basis of these three steps, make final selection of action or technology to be applied.

In some specific cases the conclusion will be that no action is possible regarding a specific problem, because the performance criteria can not be met. If this is the case the next two steps should not be undertaken, and work on this particular problem would be discontinued for this commune. Meanwhile other activities in the same commune would continue to be developed.

- for the selected action, choose with local participation the place where the action or technology should be installed or developed.

- for the selected action, undertake the development or purchase of necessary appropriate instructions for operation (such as manuals, or guidelines for organization of meetings, etc.) and the development/manufacture or purchase of necessary equipment or tools. Manufacture could already be in some cases undertaken in the commune itself.

Results: specific techniques, actions or products ready for pilot application in the commune.

Output: report (in English and Vietnamese) documenting the process and results of each of the above stages; appropriate instruction documents for operation of the selected action; tools and equipment required for application in the commune.

v). APPLICATION

Objective: for each selected action, pilot application in the commune to enable in use evaluation and training.

Method: application on a small scale of each selected action, involving the following steps:

- establish agreement with local partners who will be trained, and will later be responsible for training others and for execution of action.

- implement action, using instruction documents or materials and using tools and equipment developed in the preceding stage.

- train local partners to carry out the action, including training on site for practical work.

- monitor the application process; check costs, material quantities and labour inputs for each stage of implementation, and monitor time involved in training. Monitor materials supply process and delays. Monitor user and public reaction.

Result: small number of pilot applications of selected action or technology completed.

Output: for each technique, a report (in Vietnamese and English) documenting the entire process and quantities and time involved; several examples of pilot application.

2.3. Phase 3. DISSEMINATION

This phase has two parts: (vi) Evaluation of social appropriation of the action; and (vii) Wide scale dissemination of the technique.

vi). Evaluation of social appropriation.

Objective: for each action (technique or technology), the aim is to assess what local resistance there is to the acceptance and use of the new technique or to the wider dissemination and encouragement of an existing and proven technique already in the commune, and to assess how this can be overcome; to develop a strategy for the wide-scale application of the technique; and to develop the necessary materials (media etc.) needed for dissemination of the technique.

Method: undertake, for each action, three steps: the assessment of local resistance to the introduction of the new idea, the development of the strategy for wide-scale dissemination, and the preparation of media and tools for implementing the strategy.

- assessment of local resistance: undertake a survey of resistance to the technique, the survey to cover the whole range of people involved, including resistances which can be identified amongst the targeted users, the builders or producers, the local technicians, the local people's committee and cooperatives, the local authorities, the staff of the NCRPD and of the CATTIC, and any other people involved.. The survey should also be conducted to resistances to practical aspects of the technique, for example, objections to the type of material, to the technique of construction, to the design, to appearance, to the finished product, to the way it can be used, etc..

Resistances should be classified by type:

objective resistance, such as ideas about material limitations, or lack of technical understanding;

and

subjective resistance, for example, because the technique looks 'old fashioned'.

- According to the type of resistance (who has objections, what sort of objection, etc.) identify how these resistances can be overcome, and what steps to take to achieve a wide-spread application of the technique. For example, a new technology might involve organizing several village level training programmes, organizing an information campaign, carrying out several demonstrations, and mobilizing the population. To develop a strategy also requires a review of the traditional and popular methods for communicating information, as well as new techniques such as video which can also be useful.

- Prepare media and tools for dissemination of each technique. Based on the results of the two preceding steps, this stage develops the media and tools which will be used in the wide-scale dissemination of the new idea. In practical terms this can involve a variety of actions, such as the design and production of posters, the organization of public information campaigns using radio or public meetings, house to house visits, the distribution of information through the schools, the design and production of films and videos, the preparation of booklets or information leaflets designed for local use (where for example literacy may be quite low), the organization of public presentations.

Result: A clear understanding of resistances against the acceptance and use of the new idea, and an understanding of how it needs to be changed; a revised product or process to overcome these resistances (if possible); a strategy for wide-scale dissemination; identification of local people and methods which will serve to spread the information and the technique; the materials necessary for the dissemination.

Output: a report (in Vietnamese and English) documenting the overall process and findings for each action; materials required to implement the wide-scale diffusion of the proposed action, including instructions on how to proceed.

vii). Wide-scale dissemination.

Objective: for each selected action (technique or technology) the aim is to achieve wide-scale application or replication.

Method: for each selected action, apply the strategy developed in the previous stage and use the materials (media and tools) which have been prepared, to achieve wide-scale replication; for each action, undertake an evaluation of the results and achievements compared with the original criteria chosen in Phase 1.

Result: Wide-scale replication and use of the selected technique. Improved living conditions and or improved income for the target group in the commune.

Output: report in English and Vietnamese documenting the process and the results of the dissemination exercise.

2.4. Overview of action in a commune.

For each commune, there are two phases within this overall process, phases (iii) and (vi), which are extremely critical to the success of the transfer and the ultimate wide-scale replication of techniques.

Annex 2 : Built environment (Case studies)