UNITED NATIONS

UNCHS

Project VIE/86/020

Appropriate Technology Transfer in Construction

DAI ANG COMMUNE

Thanh Tri District, Hanoi

EVALUATION REPORT

November 1990

NCRPD, Hanoi.

Introductory note.

This document has been prepared by the members of the NCRPD (National Centre for Rural Planning & Development), and the CATTIC (the Centre for Appropriate Technology Transfer in Construction), in Hanoi. It has been written at the start of the VIE/86/020 sub-contract in Appropriate Techology Transfer in Construction, being undertaken with the assistance of the sub-contractors, Development Workshop and GRET.

The first phase of the sub-contract has focussed attention on the need to develop skills in evaluating the actions undertaken in by the NCRPD, in order to assess whether they are in fact "appropriate" and able to reach the people who need the most assistance in the villages.

This evaluation of work undertaken in the Commune of Dai Ang represents only a first step in developing evaluation techniques: further work will need to be done, for example, in carrying out a much more detailed analysis of costs of the technologies which have been tried out, of their affordability and potential for social appropriation, and similarly in assessing their efficiency against the needs and priorities of the villagers. Nevertheless, the process of doing a preliminary evaluation and the process of producing this report has raised awareness for the need to monitor performance more closely. The process has already served to highlight some aspects on which future work should focuss.

The report on Dai Ang, and the two other similar reports, on Hy Cuong and Yen Bac, also serve as a reference against which future actions and the reports which document them can be compared.

DW/GRET, November 1990

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Introduction

This document presents the information collected by the NCRPD and CATTIC staff regarding the resources and problems of Dai Ang commune. It then describes the actions which have been taken to improve infrastructure and homes in the commune. Some of these actions have now been evaluated, and the results are presented in section 5, followed by recommendations for future action in Section 6.

1. Project Background

1.1. Project Objectives.

The project activities aim to promote balanced growth in socio-economic condition throughout the country by assisting in the further development of human setlements in rural area of Vietnam. This to be achieved by planning and implementing programmes of infrastructure development in selected places to provide means of livelihood and to improve living conditions to people in the country-side. To achieve these aims, the following immediate objectives have been assigned to project VIE/86/020:

i. Improve the capacity within the Ministry of Construction (MOC) for human setlements planning and implementation in rural areas.

ii. Develop a functioning advisory service in appropriate technology for implementation of infrastructure development projects in rural communes.

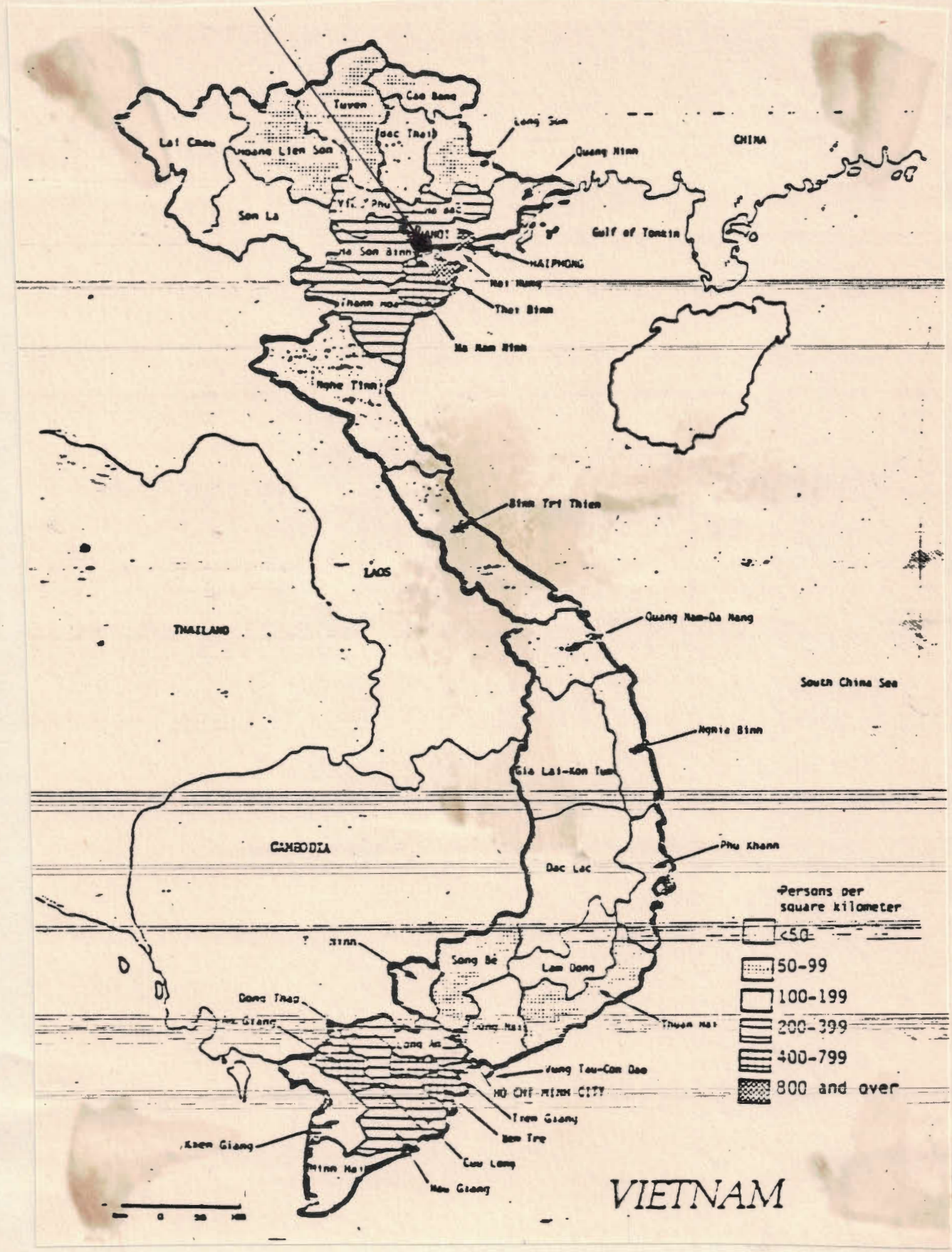
iii. Develop the coordination of infrastructure development activity and their funding in the pilot rural communes as model for replication.

iv. Increase knowledge transfer to staff of the Ministry of Construction in human setlements development in rural areas.

1.2. The pilot communes.

To serve as a learning process and testing grounds it was decided that the project would undertake actual infrastructure planning and appropriate technology (AT) application development in three pilot communes. This document concerns the experience of technology development and transfer in the Commune of Dai Ang, in the Red River Delta near to Hanoi (see location map).

Location of Dai Ang, Thanh Tri District, Hanoi



The selection criteria used in choosing communes are as follow:

i. Since the integrated rural development is the project objective, so the selected places were in rural areas.

ii. The choosen communes were poor or of average wealth (but not too poor).

iii. They are representative of 3 rural areas in the northern part of the country (such as the coastal, Red river delta, hill or mountain areas).

iv. In the first phase, the selected communes would have an easy access, not far from Hanoi (max.150Km).

v. The communes are eager and capable to receive the new knowledge and realize the Project activities. They are in urgent need for the socio-economic and physical development.

The actual selection was based on the knowledge and experience of the NCRPD experts and the local leaders who have been working in the departments of rural planning and development, and followed field trips and discussions between the project staff and the local authorities.

Once the Commune had been selected, an ageement was drawn up between the province, the commune and the Ministry of Construction and UNDP/UNCHS.

For the implementation of practical action, a financial structure was developed which is divided up as follows from four different sources:

i. Contribution cash or in kind from users in the communes.

ii. Contributions in cash or in kind from district and provincial budget.

iii. Contributions in cash from project VIE/86/020 Government counter part budget.

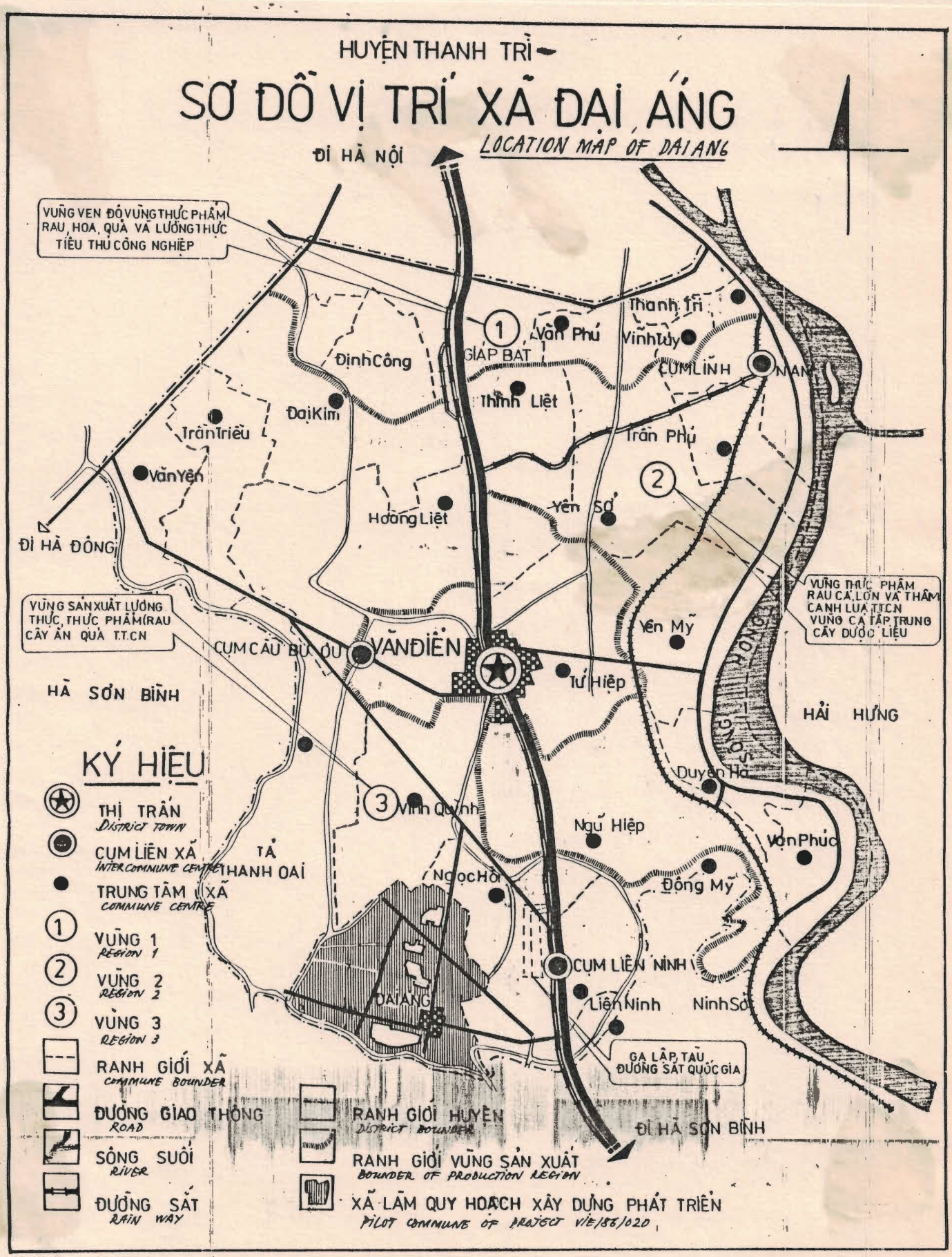
iv. Contributions from VIE/86/020 UNDP budget.

1.3. The project in Dai Ang.

Planning work started in Dai Ang in 1988. Working together with commune representatives and the people, they analaysed the commune's resources and identified the key problems which need to be addressed.

From 1988 to November 1989, a certain number of projects have been constructed on a small scale basis to serve as prototypes to show examples of `appropriate' technologies to the people of the commune. In November 1989 a second series of projects were identified, and a specific project document signed betwen the Commune and the NCRPD.

Thanh Tri District, with Dai Ang at the south, and Hanoi to the north



2. Dai Ang Commune: characteristics and resources.

2.1 The commune of Dai Ang.

Dai Ang commune was chosen as a pilot commune based on the following criteria:

Dai Ang is commune situated in suburb of Hanoi city (a rural area of Thanhtri District).

Dai Ang commune is poor but not too poor.

Dai Ang has a character similar to other rice producing communes in the Red River Delta and Hanoi suburb area.

In the first phase of the Project, Dai Ang is a selected commune because it is only about 15 kms from Hanoi and easy to reach.

Dai Ang needs social, economic, cultural and physical development. The commune is mobilized to receive new ideas and participate in the Project's objectives.

2.2. Basic data:

2.2.1. Natural conditions.

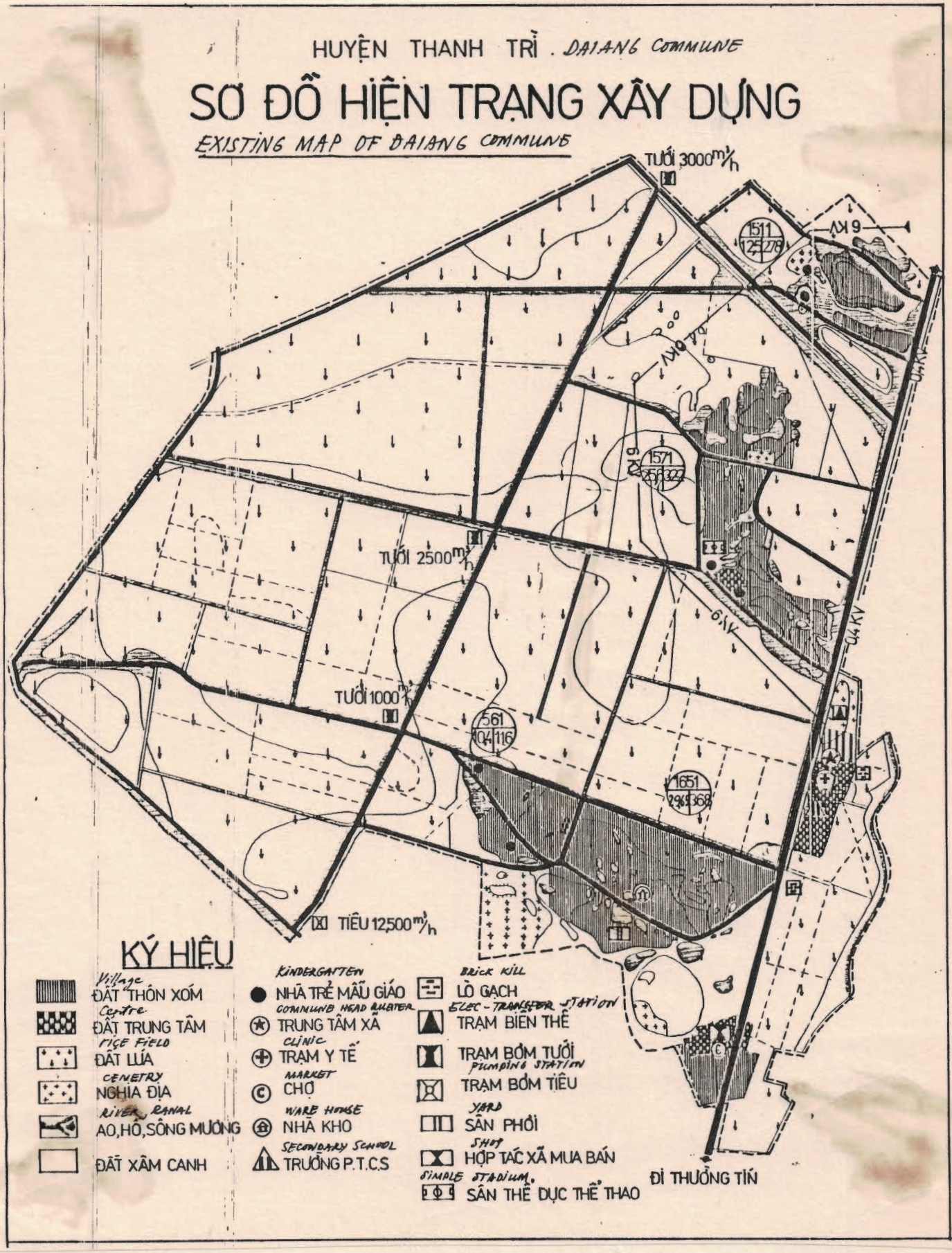
The climate condition of commune is similar to inland regions. The temperature and humidity are suitable with the development of agricultural production: growing rice and various king of vegetable, development of livestock breading.

But the soil is poor for the flood yearly draws out fertilizable substances of soil and makes acidity in subsoil.

2.2.2. Land use.

Total of natural surface:	453.062 ha
Including	
Cultivable land:	333.65 ha
Swamp, lake:	13.39 ha
Land use for irrigation systems:	35.82 ha
For road systems	21.13 ha
Villages (including lake, pool)	34.32 ha
Cemetery	8.77 ha
Unexploited land	30.0 ha
Cultivable land used for 2 crops yearly	283.2 ha
for 1 crop	50.0 ha

Dai Ang Commune : hatched areas are the villages



2.2.3. Population.

Male2334 = 43 %

Total commune population: 5338

Female3004 = 57 %

Tota l household: 1084

Average of persons per family: 5 persons/household.

Population in each village:

Vinh Thinh village: 1511 persons including 278 households

Vinh Trung village: 1517 persons including 322 households

Dai Ang village: 1695 persons including 368 households

Nguyetang village: 561 persons including 116 housholds

The population growth rate: 1985: 3.2 %

1986: 2.7 %

1987: 2.0 %

1988: 2.0 %

The population density: 1200 persons/km2

2.2.4. Labour force.

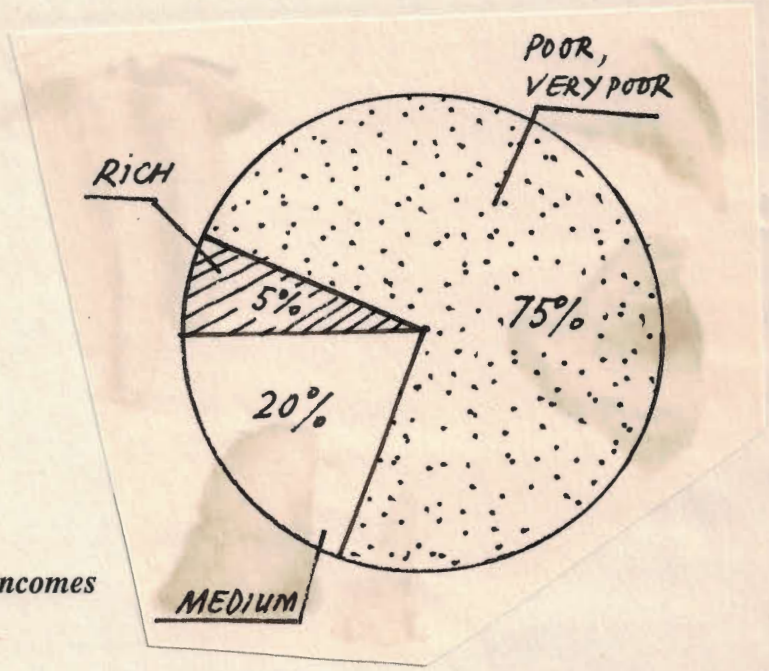
The population over 15 years old numbers 2976, representing 57.7 % the total. Main labour force totals 33.7 % with 1800 persons.

Structure of labour force in economic fields:

Agriculture:	1648 persons	91.5% of labour force
Handicraft:	20 persons	0.1% of labour force
Irrigation and drainage:	130 persons	7.2% of labour force

Labour for agriculture takes up 90% of the overall labour force.

About 5-7% families are rich (surplus), 20% families are medium, 73-75% families are poor.(see below).



Proportionnal distribution of commune incomes

2.2.5. Production organization.

Dai Ang is a commune specializing in rice production. It is a cooperative. Structure of production organization is based on villages which form into working groups. The commune has 12 working groups and farmers follow a sub-contract system for rice production.

Apart from 12 working groups for food production, there is a capital construction group with 130 persons. This group is responsible in building the road system and the irrigation - drainage system in commune, and other services.

3. Identification of problems and priorities

3.1. The socio-economic development situation.

Dai Ang is an old-established commune, and has characteristics that are similar to other communes in suburb. Although it is situated next to Hanoi there are a large number of families who are poor and also socially backward. The economic development of Dai Ang is joined to the city, and annually Dai Ang supplies Hanoi city with a very small quantity of rice, pork, and vegetables.

Because of being a low-lying commune in Thanh Tri district, Dai Ang often suffers from floods coming up stream in the rainy season (from August to November). In the Southern part of Hanoi city, an ambitious irrigation and drainage system is being built following disastrous floods, and it is due to be finished by 1991 so that the agricultural land can be used for intensive farming and crop multiplication (three crops per year). This will include Dai Ang commune. However until now the irrigation and drainage system is not able to meet the requirement of preventing floods. For Dai Ang, the issue reamins for now how to resolve the drainage problem for rice production in summer - a main crop - when the flooding and destroys the harvest of commune.

After each flood the commune faces many difficulties in its socio-economic development. For years the essential requirements of people's every day life has not been met, and above all there is a shortage of food. In 1988, 50% families in commune had a monthly family income of less than 20,000 dongs.

There is also an acute shortage of basic civil services such as potable water, electric power supply, and houses are in poor condition (50% of total houses are temporary or too old) and similarly there is a bad transport network.

Most especially, the problem is one of water supply: there is no source of safe drinking water in Dai Ang commune. The water available within a depth of 8-10 m is unfit for human consumption. Similarly, at present it is possible to electrify only the pumping station, and electricity for household use is still lacking.

Deficiencies also exist in respect of other essential services, ie. waste disposal, sanitation, woman and child health care. Some diseases come from the flood, and the flood creates bad sanitary conditions in village.

People depend on the rice production, but they do not have enough rice to eat. For a decade (1976-1986), the commune lacked of food to supply to the people. The annual average income per person is only 100-120 kg of rice whilst the minimum need is about 300 kg).

The commune has a potentional for fish farming with over 30 ha of lakes and ponds. But this potential for fish has not been developed, nor for passive drainage and irrigation.

The potention of traditional handicraft (embroidery, knitting, carpentry, making hats,...) has not been developed largely becasue of a shortage of raw material and the absence of proper organization of production of handicrafts for consumption and export. Overall there is bad employment situation in the commune.

3.2. Estimation of development capacity of Dai Ang commune.

The potential of agricultural production: Dai Ang commune is able to develop agricultural production. Once the commune has a good irrigation and drainage system for paddy rice production, it will get more rice productivity. Through yearly crop multiplication, Dai Ang commune can over come the storage of foodstuff, and develop pountry and livestock breeding.

The potential of existing family labour: on average, there is only about 4 to 6 months work per year. If people could have more work, the commune economic development would get better and make use of the contingent of available artisans and craftsmen.

The potential of fishing breeding: with over 30 ha of lake and swamp, Dai Ang can develop fishing breeding to get more agricultural product, and tus make use of waste water from Hanoi city.

The potential of family economic development: with family labor and household garden, every family in Dai Ang commune can get more income. At the present time, the family gardens have not been used effectively. If Dai Ang commune has a suitable project on hte development of the family garden, this would enable the people to better exploit their pond, garden and family labor.

The potential of better links with Hanoi: being a Hanoi suburb commune, if Dai Ang had a good road network for communication it could make more use of its location. This calls for imoroving the roads.

3.3. Main objectivities of Dai Ang development project.

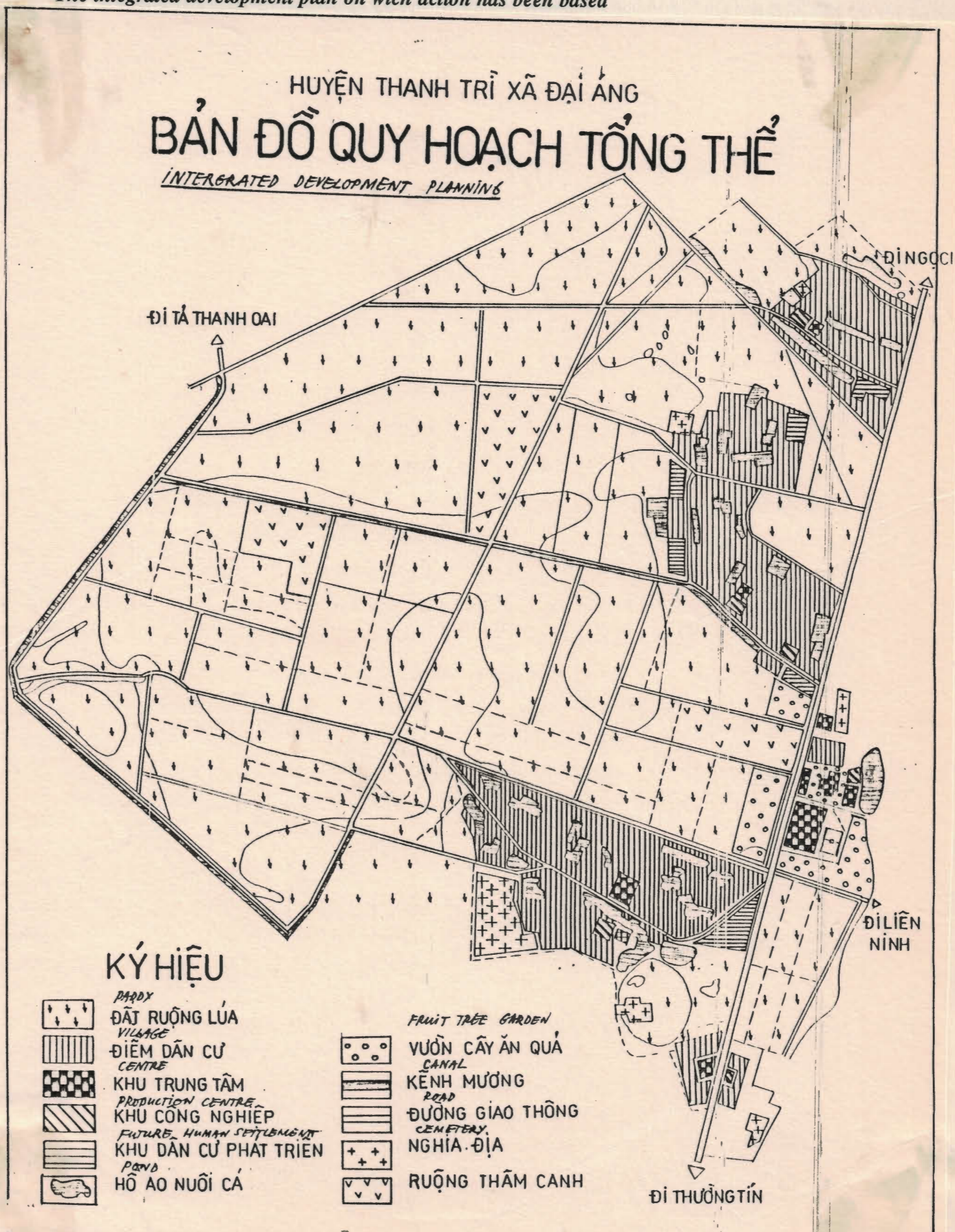
- Make out an integrated development plan of commune aimed at the following:
- Resolve urgent problems in the development of production potential. There is the need to complete irrigation and drainage system for the protection flood, to improve arable land and thus raise productivity of rice with multiplication of yearly crops.
- Resolve the problem of employment. There is a need to provide jobs for all working people to exploit all available land, and to develop all the capacity of handicraft workers.
- Develop family and cooperative economics to overcome the shortage of foodstuff and the other demands of the people's lives.
- Improve the infrastructure system. This calls for the rehabilitation and construction road system, the irrigation and drainage network, and better water supply, energy supply, and housing.
- Promote commune effort and helping organize people to participate and contribute their money and time in the process of the implementation of project. Encouraging people to adapt to the appropriate technologies using local material and farmer's skills.

- Undertake pilot planning through to implementation, and thus propose sound answers for commune development planning. These can also be disseminated widely to other communes which have similar condition.

3.4. Intermediate objectives for planning and implementation and sectional projects (priority projects).

- Road construction.
- Water supply: water filter tank, hand pump.
- Pumping station.
- Set up commune garden - development family gardening.
- Energy supply: improved stove, biogas tank, energy tree plantation.
- Improved latrine construction.
- Housing development.

The integrated development plan on wich action has been based



4. Appropriate Technology transfer in Dai Ang

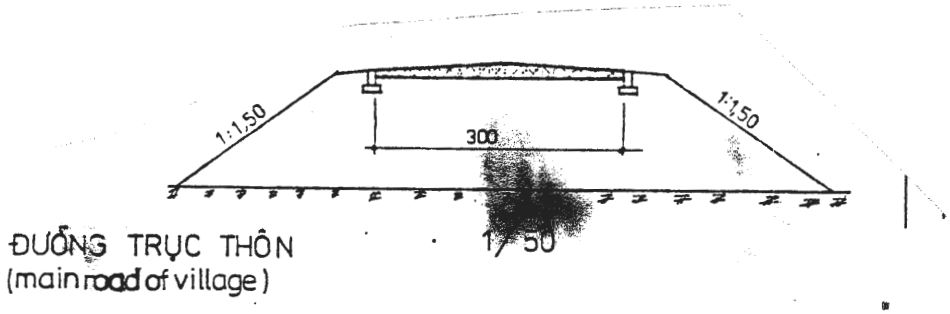
4.1. Programming.

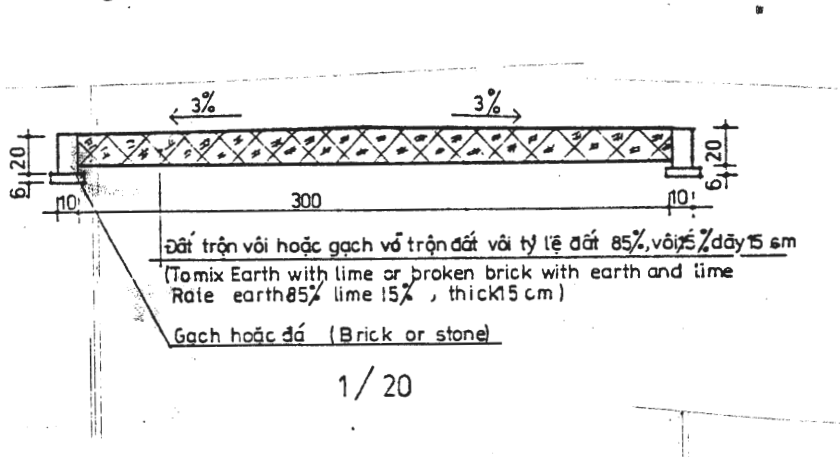
Infrastructure planning and development work in DAI-ANG commune started in 1988. Between 1988 and November 1989, a certain number of projects were implemented on a small scale basis to serve as prototypes for demonstration and testing.

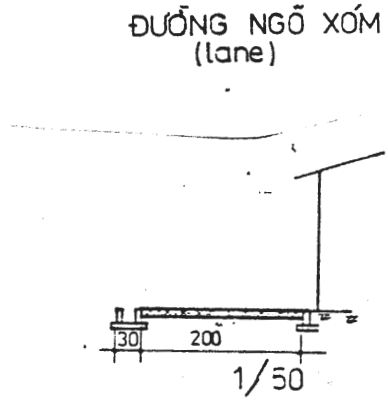
Fig 1. shows the 1988 -1989 projects which have been implemented. After the signature of the project document a larger programme of implementation was agreed utilizing joint funding from the UNDP budget and people's contributions. Technical details on the projects are given below and financial data can be found in Fig.2 "Estimated budget for prototypes construction in DAI-ANG commune" (1990).

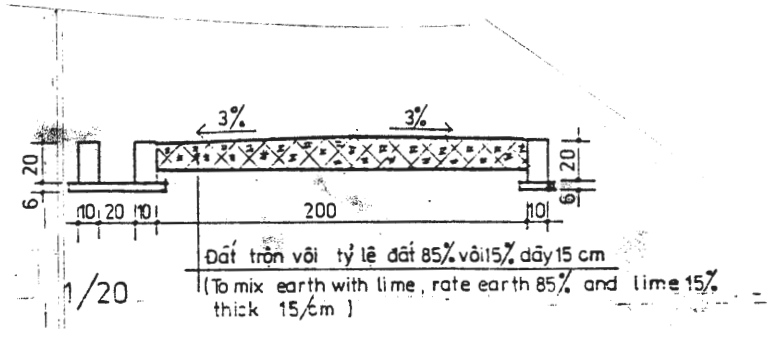
4.2. Village roads.

The village roads are constituted mainly of earth, this is why they deteriorate very quickly, mainly during the rainy season, resulting in acute transportation problems for the people of the commune. Road improvement has been identified as the first priority by the people of Dai Ang. It is proposed to improve 5.6 km of road by earth and lime and broken brick.









Road profiles in the commune of Dai Ang

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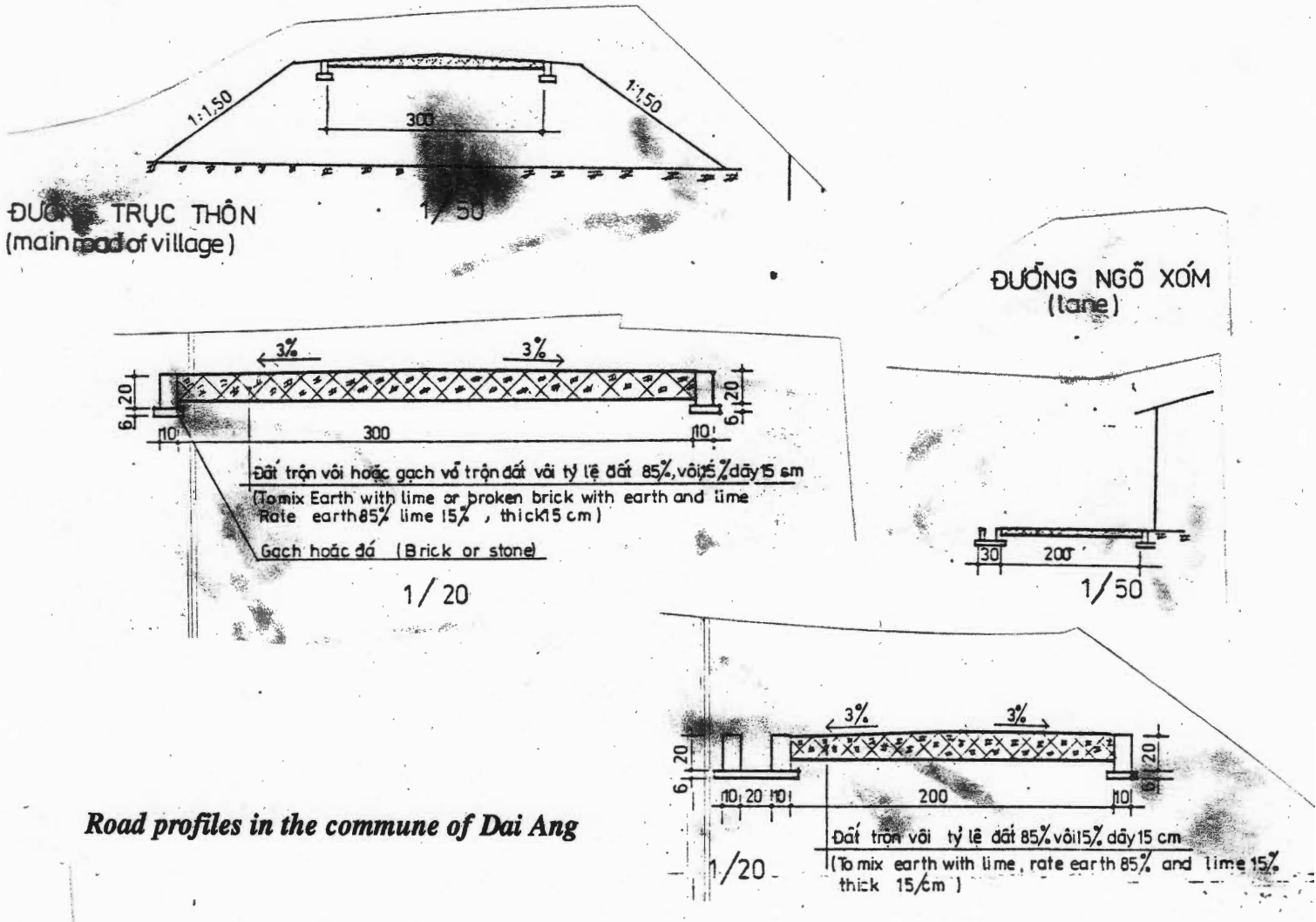
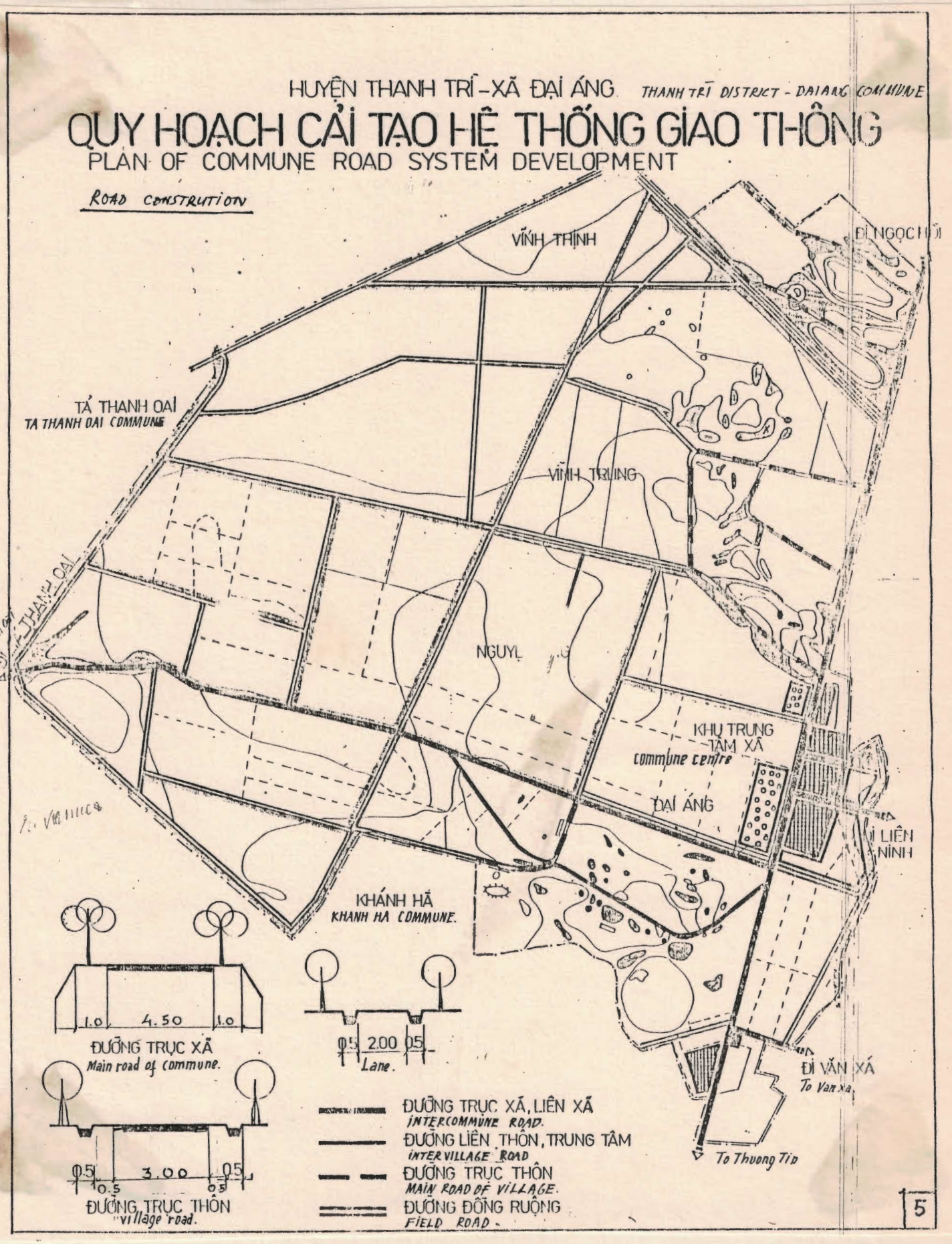
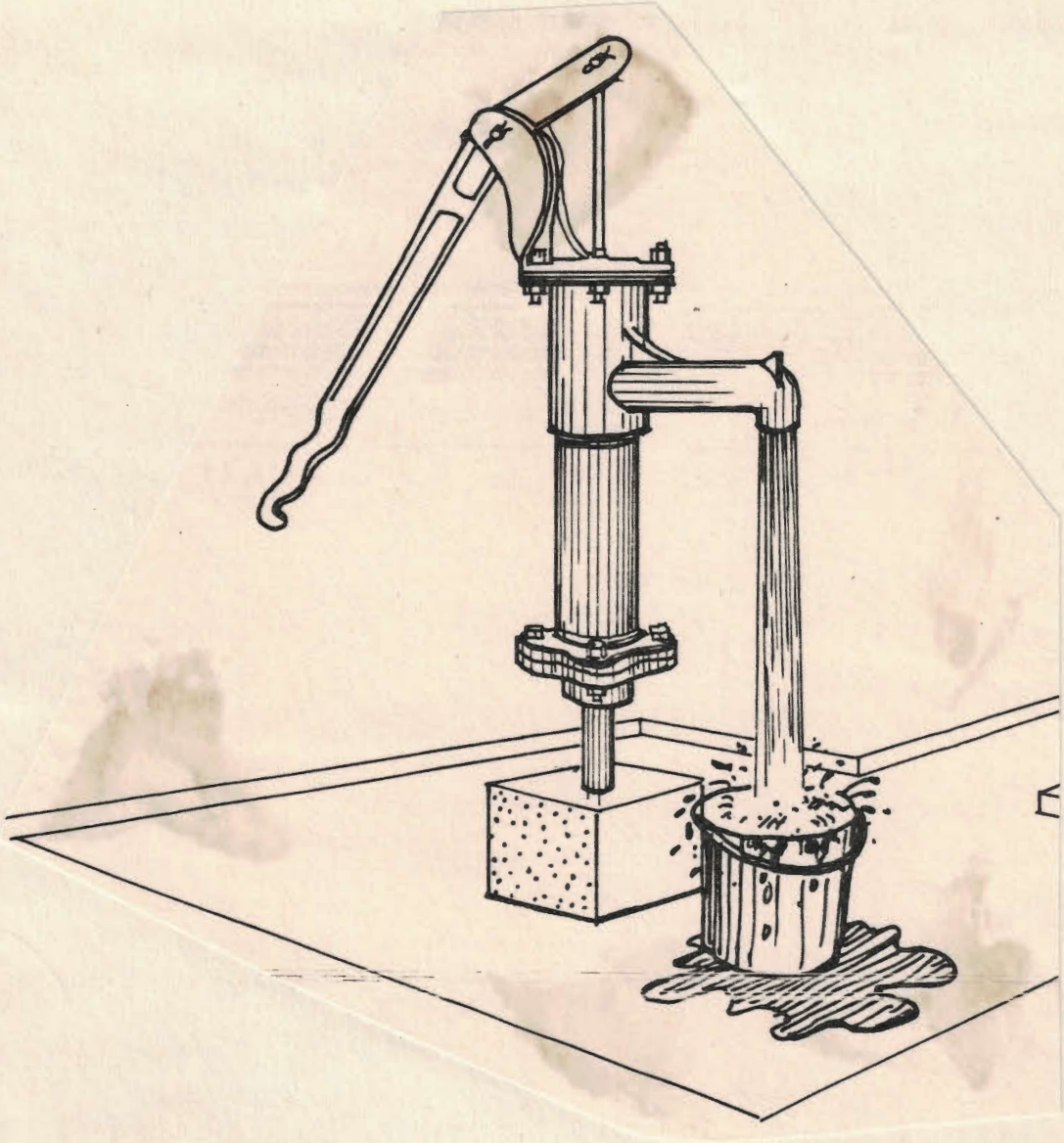


Road profiles in the commune of Dai Ang

Plan of commune road system



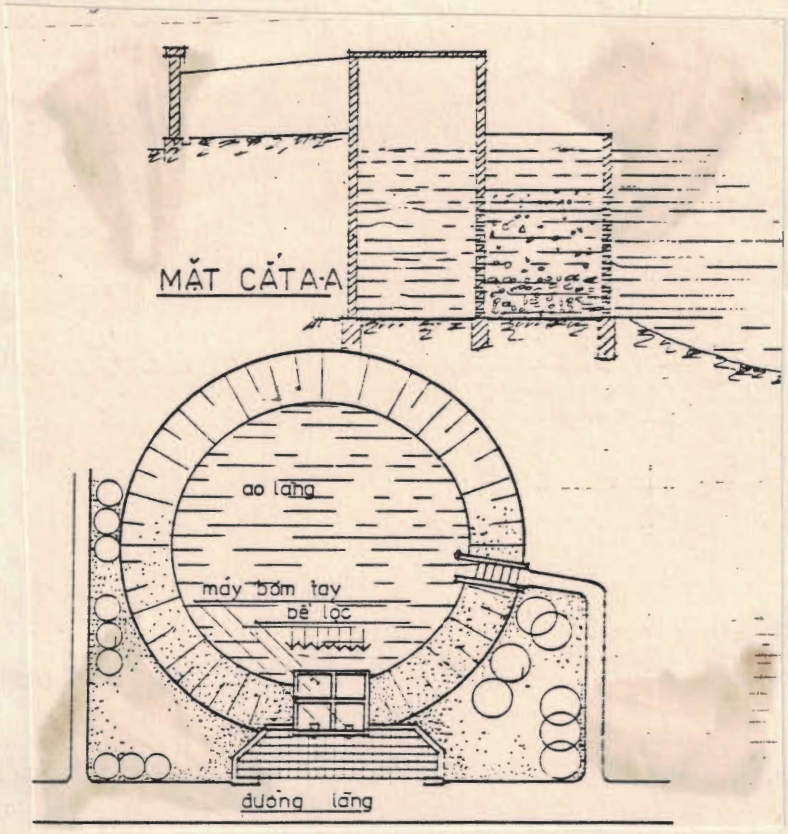
Vietnamese water pump used in the project

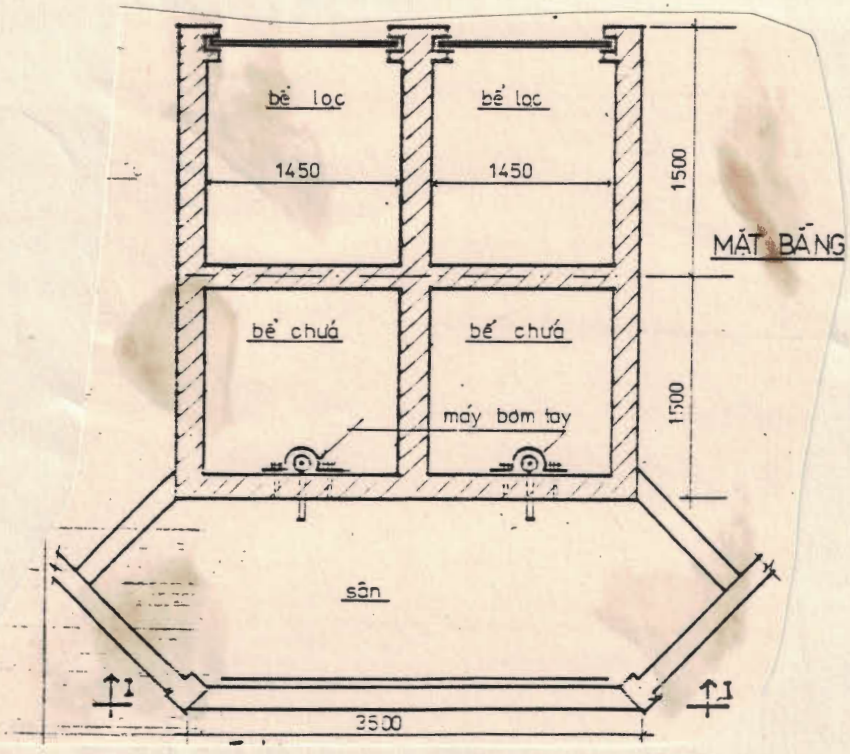


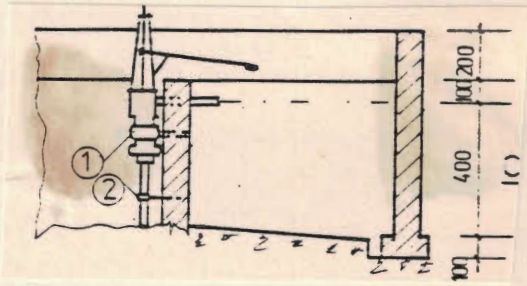
4.3. Water supply.

The quality of water in Dai Ang commune is bad. Water from the ponds and wells has a yellow color with a high iron content and a lot of microbes. Water is often influenced by drainage from city. To improve this situation it is proposed to build 100 filter tanks. The tanks are made of brick and concrete. The tanks will be build next to the well, so that people can take up the water from the well and pour it into first box of the tank (filter). The water comes slowly through filter materials including yellow sand, lime stone, charcoal, broken brick. Then water comes into second storage tank (holds 0.5 - 0.8 cubic meter of filtered water). People use fresh water from second tank.

Public water filter and pumps built at the village water well

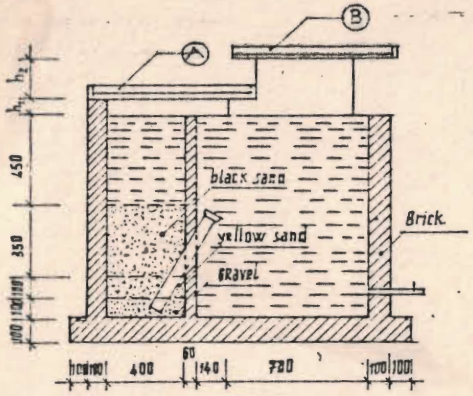




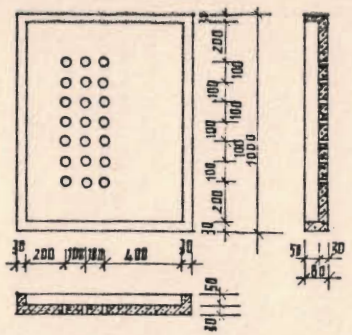


Domestic water filter used in Dai Ang

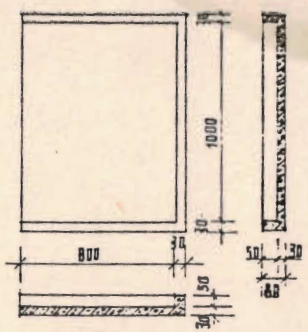
SIMPLE WATER FILTER TANK



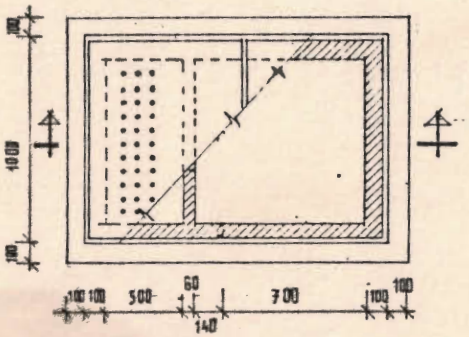
CUT 1-1 1:20



PANEL A 1:20



PANEL B 1:20



PLAN 1:20

MATERIALS LIST

Item	unit.	Quantity
1. Pebbles	m^3	0.20
2. Big grain of sand.	m^3	0.20
3. Small grain of sand	m^3	0.60
4 Brick	Pice.	500
5 Cement	Kg.	80
6 Quick lime	Kg	100
7 Steell $\phi 4$.	Kg	3
8 Steell net	m^2	2.50
9 Water pipe $\phi 20$	m.	0.20
10. Water Valves	each	1

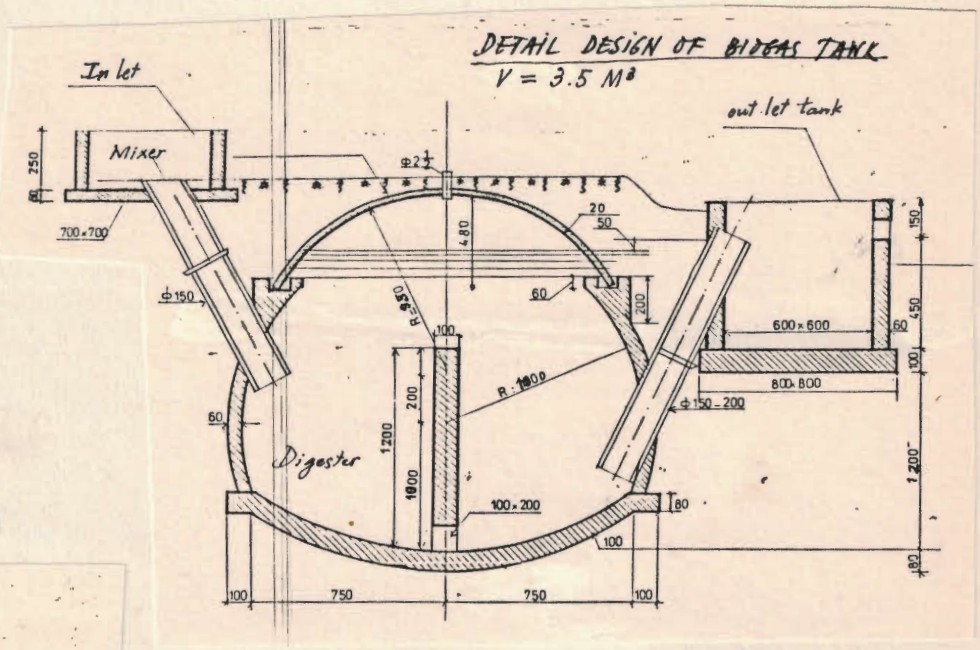
DETAIL DESIGN OF WATER FILTER TANK FOR FAMILY.

TRUNG TÂM PHÁT TRIỂN NÔNG THÔN	THIẾT KẾ CHI TIẾT BỂ LỌC NƯỚC GIA ĐÌNH DUNG TÍCH CHỨA 2 M^3			BẢN VẼ SỐ
				HOÀN THÀNH 1
GIÁM ĐỐC	KIỂM	CHỦ NHIỆM	THIẾT KẾ	CAN
Nguyễn Văn Thon	Lê Quang Đính	Nguyễn Thanh	Phạm Công Bình	Phạm Công Bình

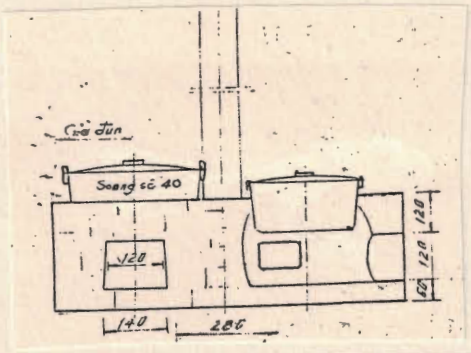
4.4. Energy supply.

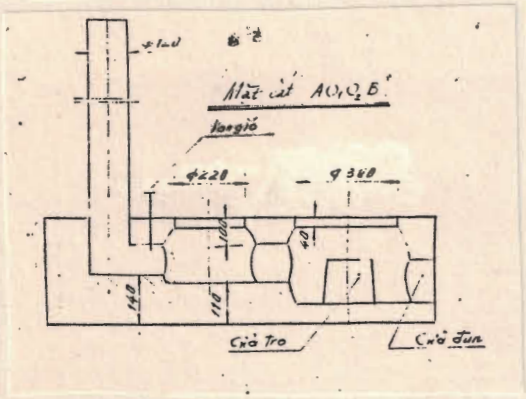
Finding fuel for domestic use is a major problem in the commune. There is a serious shortage of fuel for both cooking and lighting in the commune. 45 improved stoves and 1 biogas tanks were built between 1988 and 1989 to serve as prototypes for demostration and testing.

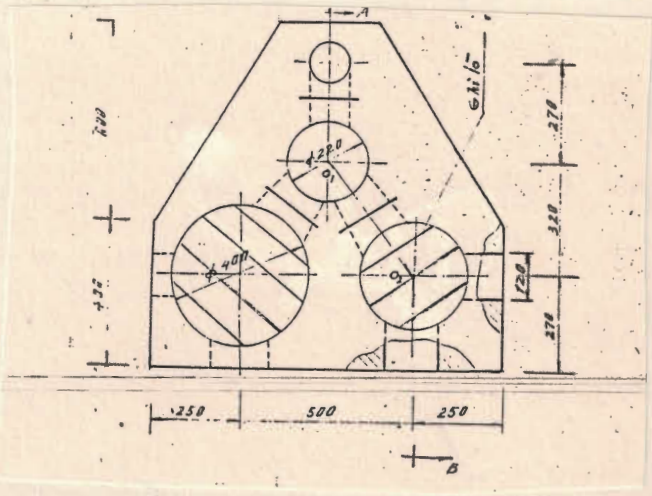
The construction of improved stoves and biogas tanks will continue to help people to take full use of waste material and safe fuel. To help easing the fuel shortage, it is proposed to build 200 improved stoves and 5 biogas tanks according to the current planning.



Biogas installation (section)



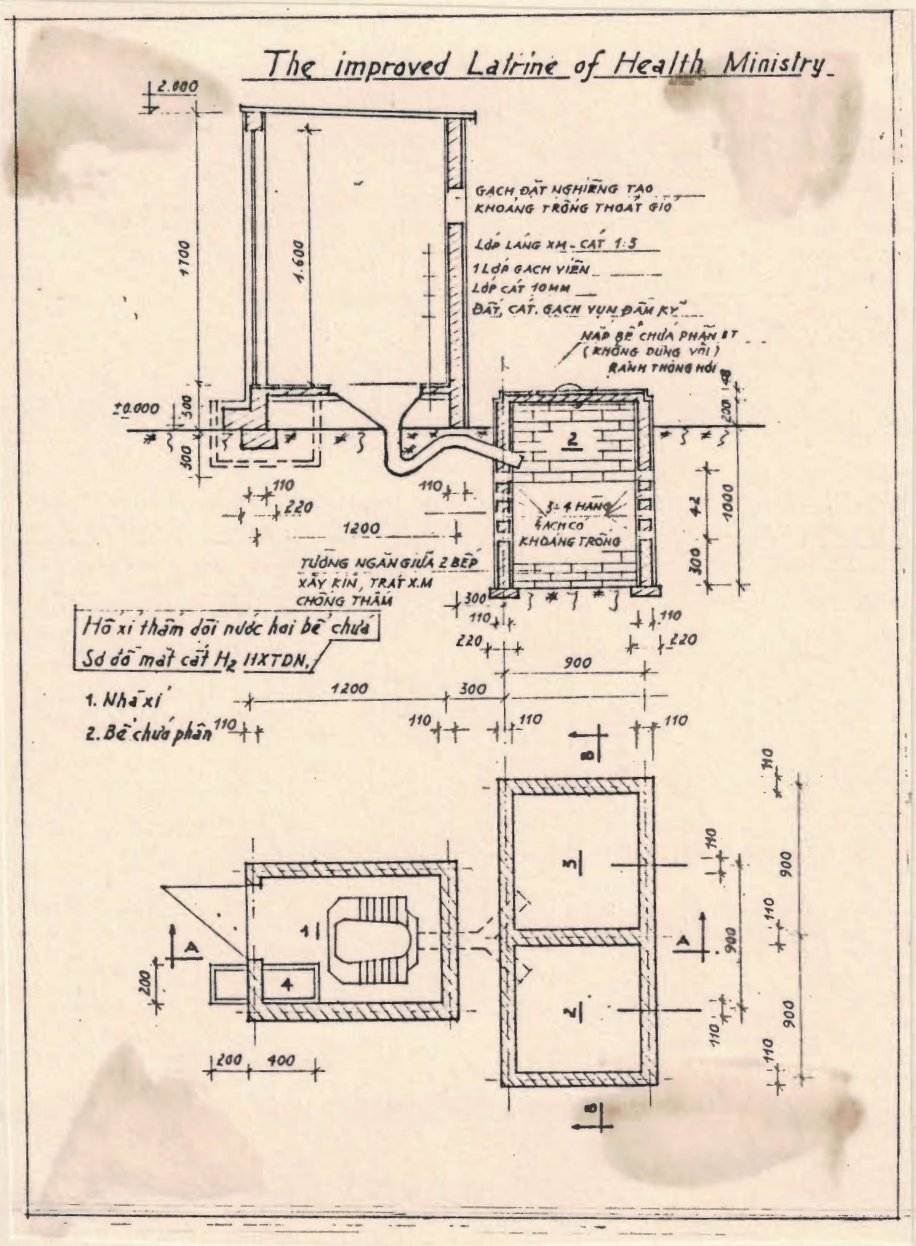




Three burner improved stove used for the Dai Ang Programme

4.5. Latrines.

Because Dai Ang is in a low lying area, the improvement of environmental conditions, especially reagrding the latrine, is very important. Dai Ang now has only 20 % of the total households with a latrine. This situation makes a bad environment in villages. It is proposed to build 50 improved latrines in 1990.



Poor flush latrine proposed for the commune. The latrine built already has been connected directly to a biogas digester, feld also from a pigsty.

Fig. 1: **PROTOTYPE CONSTRUCTION IMPLEMENTED IN DAI-ANG COMMUNE BETWEEN 1988 AND NOVEMBER 1989**

Prototype Construction	Materials	Manner and quality
1. Roads		
Inner village roads	Earth + lime	1000 m
Village road	Earth + lime	200 m (0.30x3)
2. Water supply:		
Improved village well	Brick & concrete	1 well
Water filter tank	Brick & Concrete	1 unit
Water hand pump	Iron	3 units
3. Energy supply:		
Improved stove	Brick & cement	70 units
Biogas tank 3 c.m	Brick & concrete	1 unit
4. Application of improved Roofing slab in cultural centre		
House construction	Concrete	100 m2
5. Energy tree and fruit tree:		
In commune garden		1000 apple trees
In household garden		500 trees
Along the village road and canal		5000 energy tree
		sandal wood t rees)
6. Sanitation:		
Improved pour flush latrine	Brick & cement	1 unit

4.6. Budgets.

The following table shows the budget allocations and sources of money for the actions planned in 1989 and 1990. Some of these will be carried over into 1991.

ESTIMATED BUDGET FOR PROTOTYPE CONSTRUCTION
IN DAI-ANG COMMUNE (1990)

PROTOTYPE CONSTRUCTION	Manner and Quantity	MATERIALS	Price of unit	Total of expend diture	Resource of unit		
					Comm. People	Subsid -fund	Project
1.Main road	0.3x5x2500	Stone+earth		160000	10000	160000	
2.Rebuild clinic & culture house		Brick+concrete		30000	5000	25000	
3.Village road:	0.15x3						
-in VINHTHINH	1.800m	Earth+lime		15500	8500		7000
-in VINHTRUNG	1.000m	Earth+lime +brokenbrick		18000	9000		9000
-in VINHTRUNG	500m	Earth+lime		4500	2000		2500
-in DAIANG	1.200m	Earth+lime		10000	6000		4000
-in NGUYETANG	1.100m	Earth+lime +brokenbrick		20000	10000		10000
4.Water supply - improved village well	3 units	Brick+concr	5000	15000	9000		6000
-water filter tank	100unit	-	200	20000	14000		6000
5.Energy supply - improved stove	200 -	-	50	10000	8500		1500
- biogas tank 3 c.m	5 -	-	900	4500	2500		2000
6.Sanitation - improved latrine	50 -	-	100	5000	3000		2000
TOTAL :				322000	87000	185000	50000

4.7. Finished products.

In November 1990, the following inputs have been completed or are under way.

1. Road construction	700 m (and 1700 undr construction.)
2. Water supply (public filter & pumps)	1 (and 1 under construction)
3. Family water filter	1
3. Pumping station	0
4. Commune Garden	1
5. Energy: improved stoves	70 (some under construction)
6. Energy: biogas	1
7. Energy: tree plantation	5000
8. Latrines	1
9. Concrete roof panels	100 m^2

The following section presents the evaluation of several of these actions.

5. Evaluation

5.1. Criteria and methods.

This evaluation has been undertaken by the members of the NCRPD team who have been workin in Dai Ang. The evaluation has involved three main steps. First, the establishment of criteria against which each technology can be evaluated, secondly, the evaluation in the field of each AT, through discussion and observation during visits to households. And thirdly, a more detailed economic analysis of certain techniques of comparable performance, to see whether the innovations being introduced are making it easier to improve living conditions.

The evaluation sheet used on the following pages lists the criteria that have been agreed upon in discussion by the VIE/86/020 team and the consultants. At the same time, the evaluation has addressed the question "Who is the target group and is the technology reaching them ?" Distinction has been made between four groups of users in the commune:

1. The Public.
2. Rich Families with a good surplus.
3. Medium families with a tiny surplus.
4. Poor families, who in many cases need subsidies to survive.

Following the field visit in early November to Dai Ang, the team working on Dai Ang filled in the evaluation sheet for each technique, and discussed the results. This lead to the establishement of several conclusions and some recommendations for the future. Summary conclusions are shown at the bottom of each evaluation sheet, and an overview is given in the next section, No. 6.

5.2. Evaluations

5.2.1. Fuel & Cooking: traditional stove; improved stove; biogas.

TECHNOLOGY EVALUATION SHEET (1)

NAME OF TECHNOLOGY: A. TRADITIONAL STOVE ; B. IMPROVED STOVE ; C. BIOGAZ.
PLACE: DAI ANG
DATE OF EVALUATION: 6/91
NAMES OF EVALUATORS: GROUP

DOES TECHNOLOGY REACH TARGET GROUP?

CRITERIA	TARGET GRO PUBLIC A	B	C	FAMILY RICH A	B	C	MEDIUM A	B	C	POOR A	B	C
AFFORDABLE TO MAKE?	2	2	1	2	2	2	2	2	1	2	2	0
CHEAP TO MAINTAIN?	2	2	1	2	2	1	2	2	1	2	2	0
ALLOWS SELF HELP?	/	/	/	/	/	/	/	/	/	/	/	/
USE LOCAL MATERIAL?	2	2	1	2	1	1	2	1	1	2	1	0
TECHNOLOGY EASY?	2	2	0	2	2	0	2	2	0	2	2	0
ORGANIZATION EASY?	2	1	0	2	1	0	2	1	0	2	1	0
TRANSPORT EASY?	2	1	2	2	1	2	2	1	2	2	1	2
MAINTENANCE EASY?	2	1	1	2	1	1	2	1	1	2	1	1
REPLICABLE?	2	1	0	2	1	0	2	1	0	2	1	0
SUITS ENVIRONMENT?	0	2	2	0	2	2	0	2	2	0	2	2
DURABLE?	1	2	2	1	2	2	1	2	2	1	2	2
CREATES INCOME?	0	1	2	0	1	2	0	1	2	0	1	2
SAVES ENERGY	0	2	2	0	2	2	0	2	2	0	2	2
SUITS LOCAL HABITS?	2	2	1	2	1	1	2	1	1	2	1	1
	19	21	15	19	20	16	19	20	15	19	20	12

ANSWER '0' FOR NO OR BAD
'1' FOR MEDIUM
'2' FOR YES OR GOOD

CONCLUSIONS:
- Improved stores are quite suitable to Dai Ang. It meet the demand of saving energy there.
- Biogaz cost is hight. Poor and medium families can not afforda it.

5.2.2. Water: traditional well; improved water filter; public filter.

TECHNOLOGY EVALUATION SHEET (1) B/ IMPROVED WATER FILTER

NAME OF TECHNOLOGY: A/ TRADITIONAL WELL C/ PUBLIC FILTER.
PLACE: DAI ANG
DATE OF EVALUATION: 6/XI/90
NAMES OF EVALUATORS: GROUP.

DOES TECHNOLOGY REACH TARGET GROUP?

CRITERIA	TARGET GRO! PUBLIC A	B	C	! FAMILY RICH A	B	C	! MEDIUM A	B	C	! POOR A	B	C
AFFORDABLE TO MAKE?	2		2	2	2		2	1		1	0	
CHEAP TO MAINTAIN?	2		2	2	2		2	2		2	1	
ALLOWS SELF HELP?	-											
USE LOCAL MATERIAL?	2		1	2	1		2	1		2	1	
TECHNOLOGY EASY?	2		2	2	2		2	2		2	2	
ORGANIZATION EASY?	2		2	2	2		2	1		2	1	
FLEXIBILITY TRANSPORT EASY?	1		1	2	2		2	2		2	2	
MAINTENANCE EASY?	2		1	2	1		2	1		2	1	
REPLICABLE?	2		2	2	2		2	2		1	1	
SUITS ENVIRONMENT?	0		2	0	2		0	2		0	2	
DURABLE?	0		1	0	2		0	2		0	2	
HEALTH BENEFIT CREATES INCOME?	0		1	0	2		0	2		0	2	
SAVES ENERGY												
SUITS LOCAL HABITS?	1		1	1	1		1	1		1	1	
	16		18	17	20		17	19		15	16	

ANSWER '0' FOR NO OR BAD
'1' FOR MEDIUM
'2' FOR YES OR GOOD

CONCLUSIONS: - Improved water filter for family or group of families is quite suitable in village either rich or poor target group.
- It's a appropriate technology that very nessecary for each family and easy to apply in large scale.

5.2.3. Small domed shell for roofing.

TECHNOLOGY EVALUATION SHEET (1)

NAME OF TECHNOLOGY: SMALL-SHELL FOR ROOFING.
PLACE: DAI ANG
DATE OF EVALUATION: 6/X1/90
NAMES OF EVALUATORS: GROUP.

DOES TECHNOLOGY REACH TARGET GROUP?

CRITERIA	TARGET GRO: PUBLIC	FAMILY: RICH	MEDIUM	POOR
AFFORDABLE TO MAKE?	2	2		
CHEAP TO MAINTAIN?	2	2		
ALLOWS SELF HELP?	/	/		
USE LOCAL MATERIAL?	1	0		
TECHNOLOGY EASY?	1	1		
ORGANIZATION EASY?	1	1		
TRANSPORT EASY?	2	1		
MAINTENANCE EASY?	2	2		
REPLICABLE?	2	1		
SUITS ENVIRONMENT?	2	2		
DURABLE?	2	2		
CREATES INCOME?	2	0		
SAVES ENERGY	/	/		
SUITS LOCAL HABITS?	1	1		

ANSWER '0' FOR NO OR BAD
'1' FOR MEDIUM
'2' FOR YES OR GOOD

CONCLUSIONS: - Small-shell roof could develop in public building and in flooring of houses / family
- It's not suitable with poor and medium group.

5.2.4 Water Hand-pumps.

TECHNOLOGY EVALUATION SHEET (1)

NAME OF TECHNOLOGY: Water extraction - Water Handpump.
PLACE: DAIANG COMMUNE
DATE OF EVALUATION: 6/11
NAMES OF EVALUATORS: group.

DOES TECHNOLOGY REACH TARGET GROUP?

CRITERIA	TARGET GRO! PUBLIC	FAMILY RICH	MEDIUM	POOR
AFFORDABLE TO MAKE?	/	/	/	/
CHEAP TO MAINTAIN?	2	2	2	2
ALLOWS SELF HELP?	2	2	1	1
USE LOCAL MATERIAL?	0	0	0	0
TECHNOLOGY EASY?	1	1	1	1
ORGANIZATION EASY?	1	1	1	1
TRANSPORT EASY?	2	2	2	1
MAINTENANCE EASY?	1	1	1	1
REPLICABLE?	2	2	1	1
SUITS ENVIRONMENT?	2	2	2	2
DURABLE?	1	2	2	2
CREATES INCOME?	2	2	2	2
SAVES ENERGY	2	2	2	2
SUITS LOCAL HABITS?	2	2	2	2
	20	21	19	18

ANSWER '0' FOR NO OR BAD
'1' FOR MEDIUM
'2' FOR YES OR GOOD

CONCLUSIONS:

- The cost is rather high, every material must be bought from out side and requires Skill to maintain.
- It's suitable for public and rich family
- People like it but the poor can not afford it

5.2.5. Road Construction.

TECHNOLOGY EVALUATION SHEET (1) Road construction.

NAME OF TECHNOLOGY: Road made of time + earth.
PLACE: DAIANG
DATE OF EVALUATION: 6/11
NAMES OF EVALUATORS: Group.

DOES TECHNOLOGY REACH TARGET GROUP?

CRITERIA	TARGET GRO! PUBLIC	FAMILY RICH	MEDIUM	POOR
AFFORDABLE TO MAKE?	1			
CHEAP TO MAINTAIN?	1			
ALLOWS SELF HELP?	2			
USE LOCAL MATERIAL?	1			
TECHNOLOGY EASY?	2			
ORGANIZATION EASY?	1			
TRANSPORT EASY?	-			
MAINTENANCE EASY?	1			
REPLICABLE?	1			
SUITS ENVIRONMENT?	2			
DURABLE?	1			
CREATES INCOME?	2			
SAVES ENERGY	2			
SUITS LOCAL HABITS?	2			

ANSWER '0' FOR NO OR BAD
'1' FOR MEDIUM
'2' FOR YES OR GOOD

- It requires a good organization and a close guidance also a good monitoring.

CONCLUSIONS:

5.2.6. Latrines: traditional; improved.

TECHNOLOGY EVALUATION SHEET (1) A. TRADITIONAL / B. IMPROVED

NAME OF TECHNOLOGY: LATRINE
PLACE: DAI ANG
DATE OF EVALUATION: 6/XI/90
NAMES OF EVALUATORS: GROUP

DOES TECHNOLOGY REACH TARGET GROUP?

CRITERIA	TARGET GRO: PUBLIC A	PUBLIC B	FAMILY RICH A	RICH B	MEDIUM A	MEDIUM B	POOR A	POOR B
AFFORDABLE TO MAKE?	2	2	2	2	2	2	2	1
CHEAP TO MAINTAIN?	2	2	2	2	2	2	2	2
ALLOWS SELF HELP?	2	2	2	2	2	2	2	2
USE LOCAL MATERIAL?	2	2	2	2	2	2	2	2
TECHNOLOGY EASY?	2	2	2	2	2	1	2	1
ORGANIZATION EASY?	2	1	2	1	2	1	2	1
TRANSPORT EASY?	/	/	/	/	/	/	/	/
MAINTENANCE EASY?	2	2	2	2	2	2	2	2
REPLICABLE?	2	2	2	2	2	1	2	1
SUITS ENVIRONMENT?	0	2	0	2	0	2	0	2
DURABLE?	2	2	2	2	2	2	2	2
HEALTH BENEFIT CREATES INCOME?	0	2	0	2	0	2	0	2
SAVES ENERGY	/	/	/	/	/	/	/	/
SUITS LOCAL HABITS?	2	0	2	1	2	0	2	0
	18	21	18	22	18	19	18	18

ANSWER '0' FOR NO OR BAD
'1' FOR MEDIUM
'2' FOR YES OR GOOD

CONCLUSIONS: - The improved latrines are designed and built with high attention to improving the environment.
- But the people don't like to use, the improved latrine is not suitabe with peoples habit.

Comments - It's neccessary for education and propaganda to peop for their health benefits.

6. Overall conclusions and recommendations for DAI-ANG activities

6.1 Appropriate technology planning process

The team has identified resources and needs in the commune, but priorities do not seem clear (e.g. biogas; housing construction) and design and implementation procedure have not been discussed enough (for example for the biogas, water supply), especially regarding the requirement of water supply and family garden.

6.2 Implementation process

i. There should be more encouragement selfhelp.

ii. More information should be aimed at poor and medium wealth family group.

iii. More training should be organized for local technicians.

iv. More and wider education activities should be held troughout the commune (e.g. about the usefullness of improved latrines).

6.3 Technical aspect:

6.3.1 Improved stoves

There is a serious shortage of fuel in the commune, the improved stove technology does help some families to save fuel and keep a good environment.

There is a need to improve some detail: for example, the stove could be improved with a larger hole to put in the wood, thatch, branches; a taller chimney; modifying the stove holes to take pots of different sizes.

There is a need to design a model which should be adapted to mass production, and improvement needs to be made to the surface of the stove.

6.3.2 Water hand pump

The cost is still high for medium and poor families.

It requires frequent maintenance and good skill to install and maintain the handpump. For public use, it is also difficult to maintain. There is a need to have a good organization to maintain the handpump in public place.

The hand pump (made in Vietnam) is not of high quality and its quality needs improvement.

6.3.3 Biogas

There is a need to reduce the cost (mainly in the tank wall). The cost of the biogas unit is high, it is unaffordable to the poor and medium.

It requires good construction and skill to maintain it, especially to ensure enough input (manure and waste). It is unsuitable to the family having small garden and pool.

6.3.4 Road construction

Road building requires a good organization which is difficult.

In some case, because of a lack of information for people and because of unsufficient monitoring and guidance, some inner village road have been built with low quality.

Because raos building requares the contribution and participation from people in the whole commune, there is a need to improve the way to organize people and train local technicians.

Photos

Existing village road

People participation in road construction

Existing village well

Training village worker in building filter

The first water hand pump (in Clinic)

The water filter tank