

2.5 Ha Tinh Province

2.5.1 Introduction

The Objectives of the Study Trip

A study trip to Ha Tinh province was conducted on September 29 and 30 1998 to assess organisational and human resources issues of the main stakeholders involved in RWSS at province and district level e.g.:

- The Provincial Department of Agriculture and Rural Development including Provincial CERWASS;
- The District Offices of Agriculture and Rural Development
- The Provincial Department of Health
- The Department of Health
- Mass-organisations (Women's Union)

The main objectives were to:

1. clarify their role in RWSS and the responsible section or office dealing directly with RWSS;
2. organisation, staffing and resources provided towards RWSS;
3. links and co-operation with other organisations;
4. on-going programmes, projects or activities within the project area;
5. programming, planning and evaluation procedures for RWSS activities;
6. main problems as viewed by the stakeholders.

Based on the findings a profile of the RWSS sector will be outlined - from the national level down to commune level. The profile will not, however, include details of the target communes as this is done in connection with the commune survey.

The profile will be used when addressing the involvement of the different stakeholders in each phase of the projects cycle (planning, implementation, operation & maintenance (O&M), monitoring and evaluation) e.g. in order to sustain and further develop the RWSS facilities established through JICA assistance:

1. How are the O&M of RWSS facilities to be organised and conducted;
2. What roles are the different stakeholders to have to support O&M of RWSS facilities at commune/village level;
3. What kind of HRD support will be necessary to provide through the project at each level to sustain O&M of facilities.

Confronting the selected RWSS technology and its operational requirements with the capabilities and capacities of the target communes as well as other support organisations, a HRD programme can be outlined addressing the skills, know-how and attitude as well as

organisational issues necessary for sustainable O&M of RWSS facilities.

Description of the Province

Ha Tinh province lies about 350 km south of Hanoi. Topographically the province is very diversified with mountainous and hilly landscape to the west along the Lao border and a narrow coastal plain to the east. The province covers an area of 6,000 km² with about 100,000 ha under agricultural production, mainly paddy rice.

The population is about 1,2 mill. The province was established in 1991 where the former Nghetinh province was divided into two provinces - Ha Tinh and Nghean provinces. One of the main reasons for the creation of the province was to give more attention to the present provincial area being one of the poorest in the country with an average income per capita of USD 280 in comparison to USD 350 of the country as a whole.

Ha Tinh province is divided into 10 administrative units catering for the province capital Ha Tinh, Hong Ling town and 8 rural districts.

Target Area

The following districts and communes have been selected for the study.

District	Commune
Duc Tho	Duc Yen Yen Ho Trung Le Duc Xa

Due to time constraints meetings with district representatives were conducted in Ha Tinh town. However, to get some hands-on impression a field visit was conducted to one commune Duc Yen as well as to the Duc Tho district institutions. Meetings with provincial authorities were held at CERWSS and other provincial departments offices.

Stakeholders Met

At province level meetings were held with:

- CERWASS;
- Provincial Department of Agriculture and Rural Development;
- Provincial Department of Health;
- Women's Union

During the district visit, meetings were held with the:

- Vice Chairman of the;
- The Chief of District Agriculture and Rural Development Office
- The Director of District Health Centre;

- Duc Yen Commune Health Centre;

2.5.2 Provincial Level

DARD

Meetings were held with the Director of Water Management Authority and the Chief of the Planning Section.

Organisation

DARD is divided into Section, Centres, Authorities, Groups/Teams, State Business Companies with different kinds of responsibilities. Sections are responsible for sector planning and general management. Centres are project implementing organisations. Authorities are state management organisations. Groups/Teams are scientific institutions giving advice to the different sector under DARD. Business companies are commercial enterprises involved in production of goods and services

Total staffing in DARD is 6500 employees.

DARD has eight sections: Administration, Staff & Labour Arrangement, Planning, Plants and Animal Feeding, Basic Construction, Social Issues, Agriculture & Forestry Product Processing. In addition there is also an Inspection Board. Total staffing 52.

Centres: CERWASS, Centre for Agriculture and Forestry Production, Centre for Agriculture & Rural Development Science. Total staffing 68.

Authorities: Water & Hydrology Facility Management, Flood and Storm Protection & Dam Management, Domestic Animals, Plant Protection & Forestry Development. Total staffing 260.

Groups/Teams: Overall Hydrological Planning, Overall Agriculture Planning, Forestry Investigation & Overall Planning. Total staffing 116.

There are 28 State Business Companies: 5 agriculture companies, 8 hydrology companies, 15 forestry companies. There are totally 28 companies

The most important organisations involved in RWSS are:

- Water & Hydrology Facility Management Authority which is responsible for managing ground and surface water resources. This includes giving license to exploit water resources. The authority is also overall responsible for approving projects dealing with water resource exploitation, monitoring and control.
- The Labour Arrangement Section is involved in terms of its overall control of CERWASS staff.
- Planning Section is responsible for compiling all plans within the sector including CERWASS projects.
- Social Section makes policies on water tariffs/financial support to poor households/communes.

DARD's (and CERWASS) involvement in environmental sanitation is very limited. This is dealt with by the Provincial Department of Health is responsible for all health issues related to water supply and sanitation. Department of Science, Technology & Environment is responsible for the impact on the environment from sanitation and sets standards for pollution as well as gives discharge permissions.

The Provincial Department of Health and Department of Science, Technology & Environment gives guidelines to CERWASS on RWSS project issues. The focus on sanitation is very limited. The main issue is water supply. There is a team of two persons in the Planning Section dealing with IEC on water and sanitation issues. However, there is a long way from the province down to the communes and households and budget for IEC is limited. Most IEC from province level is handled by giving instructions to district administration and provide information through mass media. The main provider of IEC on health issues at province level is the Health Centres through the Provincial Department of Health. Women's Union also gives some support.

CERWASS

Mandate and Main Objectives

The centre was established in 1991 to work with UNIFEC and other international organisations in RWSS in connection with the setup of a new provincial administrative structure. In its initial phase CERWASS was only responsible for water supply but since 1995 when it was transferred from Minister of Labour, Invalids and Social Affairs (MOLISA) to MARD it has (in principle) also been responsible for environmental sanitation.

The main objectives of the centre are to:

1. Evaluate present water supply systems;
2. Assist the province in planning (short, medium and long-term) water supply;
3. Organise and implement projects;
4. Share domestic finances to execute work;
5. Implement water supply projects supported by UNICEF;
6. Authorised to make proposals supported by domestic organisations and international donor agencies;
7. Carry out campaigns on environmental management and protection - train staff to do this;
8. Construct pilot projects on RWSS

In 1991 supported by Danida and UNICEF to establish 1000 water tanks (2 m³) for households. Since 1991 4000 RWSS projects have been established. Out of this figure 3000 cater for water wells, 12 central water supply systems, filter tanks etc.

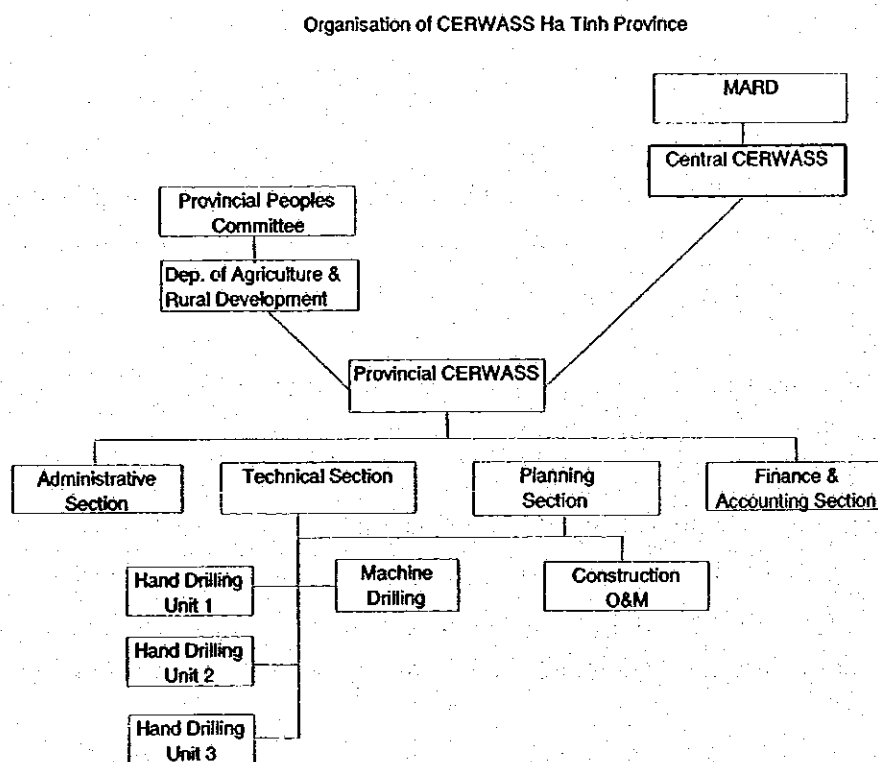
Projects can be grouped into two main categories: 1) emergency drilling projects due to lack of water in dry seasons. Funds from MARD and MOF. 2) "Normal" projects related to drilling for UNICEF projects as well as managing the building of rainwater jars. CERWASS

provide the materials for the communes on payment basis. Presently 70 well have been drilled in connection with UNICEF projects and materials for 300 jars provided. In addition 40 shallow wells have been organised through UNICEF as well as CERWASS has participating in a UNICEF programme providing water supply facilities for 20 schools.

Plans underway to drill for additional 70 wells and construction of two gravity water supply systems.

Organisation, Functions and Staffing

The present organisation of Ha Tinh CERWASS is outlined overleaf.



The centre is headed by a Director and supported by a Vice-director which together constitutes the Management Board. The Director is a geologist and has been with the centre since 1992. No Vice-director is presently employed.

Total staff is 32 of 4, which have university degrees (BSc or BA). An outline of staffing is presented overleaf.

Category	Mgt. Board	Adm.	Technical	Planning	Accounting	Hand Drilling	Machine Drilling	O&M
Univ. grad	1		1	1	1			
Technicians		2	1	2	1			
Workers		1				12	6	3
Total = 32	1	3	2	3	2	12	6	3

The **Administrative Section** has three staff.

The head of section is graduated from the Communist Party College supported by a college exam from a mechanical college. Employed in CERWASS since 1992. A document keeper supports him. One guard performs security.

The main functions of the section are to perform staff management, administrate all documents, purchasing and handle security measures.

The **Technical Section** has two staff members. The head of section is a geological engineer, which is supported by a technical expert in water supply.

The main functions of the section are to prepare and collect all technical data on RWSS systems; make feasibility studies including preliminary technical drawings; conduct construction and facility inspection and handing over procedures including training of O&M operators.

Provincial CERWASS has not the authority to make detail technical design. This is performed by the Department of Construction under the Provincial People's Committee on payment basis (500.000VND for each drawing) or by central CERWASS' Technology Transfer Section also on payment basis.

The **Planning Section** has one head of section and two staff. The head of section has had his position for five years and has a degree in nuclear science and economics. Presently the head of section is undertaking part-time training in environmental science at the technical university. One expert is in charge of planning and the other is in charge of cost estimates and calculations.

The main functions of the section are to make annual projection plans according to the proposed RWSS projects to be investigated and implemented¹³. The planning is based on:

¹³ The Administrative Section does administrative planning on the operations of CERWASS.

- 1) annual national government targets (MARD);
- 2) requested projects from the districts/communes;
- 3) Central CERWASS approval and priorities

Selection by CERWASS is based on the specific conditions of the applicant regarding present quality of domestic water and to which degree water is infected and is causing diseases. The planning is done in the following chronological way:

1. The Commune People's Committee through the district administration (District Agriculture and Rural Development Office or the Department of Health) forwards a request. The request is then screened and forwarded together with other requests to Provincial CERWASS which will approach the communes and take water samples to make preliminary analysis of water quality. At the same time the communes are asked to make an official letter of request for a water supply project.
2. The request is then sent to CERWASS through the district administration which makes (an annual) priority list of applications.
3. CERWASS make a feasibility study and forward the application to Central CERWASS through the provincial administration (DARD).
4. At CERWASS the feasibility study is assessed and compared with other incoming applications before it is included in the annual budget applications to MARD and MOF.
5. If the application is approved technically (still waiting for budget allocation), CERWASS send letter of approval back to the commune through DARD and CERWASS;
6. Provincial CERWASS initiate technical design and cost estimates. This is done either by other provincial departments (Department of Construction) or the Technology and Capital Investment Section at Central CERWASS.

The provincial long-term development plan together with national sector plans provides the yardstick for monitoring and evaluation. It includes targets for each sector to be achieved over a stated period of time (5 - 10 years). If necessary, these targets are revised during the annual planning cycle. They provide the basis for the annual plan for each provincial department and reporting shall include a comparison of planned and actual achievement.

The Department of Planning and Investments (Economic Section) provide supervision and approval of budget provisions and release of funds.

The Accounting Section has two staff. Head of section is BA in economics and the other staff member is a college graduate. They are responsible for managing the internal operating budget and income generating activities of Provincial CERWASS (but not project related cost estimates). Income generating activities are used to finance non-state employees (those who

The operational budget is allocated from the provincial finances through national budget allocations.

are not on the national/provincial budget pay-list.

The section is responsible for in keeping project accounts. A state company under MOF audits accounts.

The monthly budget for provincial CERWASS operations (excluded project finances) is 7 mill VND from the provincial budget. Worker's Union at provincial CERWASS is auditing these accounts.

Drilling Teams. There are three manual drilling teams each having four staff of which one is Drilling Team Leader. Six staff is allocated to one machine drilling team

O&M of Construction Team. Three staff to a team dealing with guiding O&M of water supply installation. Facility operators or state/private companies generally perform either O&M work. The supervision is a income generating activity of provincial CERWASS.

The drilling teams and the O&M team are responsible to the Technical Section on technical matters while the Planning Section decides where and when to drill and support O&M of facilities.

No workshop facilities are located at provincial CERWASS.

Provincial Disease Prevention and Sanitation Centre (PDPSC)

The PDPSC reports to the provincial Department of Health. Its key functions are regulatory related to the monitoring and enforcement of standards, although delivery of public services including IEC programmes are also included in its mandate. The main functions of the PDPSC are:

- Provision of primary health care services;
- Control and monitoring of environmental sanitation;
- Monitoring of industrial and occupational health;
- Health monitoring in schools;
- Inspection of sanitary facilities in public works;
- Provision of malnutrition prevention programmes;
- Epidemiological monitoring of 23 communicable diseases;
- Vaccination programmes;
- Health education;
- Control and monitoring of epidemic diseases.

As available funding determines the activities of PDPSC, the National Environmental Sanitation Programme of UNICEF for controlling and testing of latrines and water quality is a core activity.

The PDPSC has comparatively large staff with qualified doctors, nurses, technicians, and laboratories and support staff. In Ha Tinh PDPSC includes 36 members of staff. The staff is organised in 5 main sections:

- Administration (6 staff);

- Sanitary Faculty (provide training on health issues related to RWSS) (8 staff);
- Disease Prevention Faculty (10 staff);
- Baserdow's Disease Prevention Faculty (hypertrophy of thyroid) (7 staff);
- Laboratory (provide testing of domestic water) (5 staff).

The PDPSC works through the Department of Health and the Commune Health Centres through delegation of responsibilities, issuing orders, monitoring performance according to set targets, and provide professional support including laboratory services.

Upon request from the Department of Health - which in turn is requested by the Commune Health Centres (CHC) - staff from the DHC laboratory collects water samples and other samples to establish the causes of any water diseases. If the tested water is found condemned, the polluting source must be detected by the CHC with technical support from DHC or the PDPSC.

In principle water from wells should be tested regularly - especially after flooding. In general water from wells should be tested every 3 months. In connection with piped water systems testing of water quality should be performed twice a week¹⁴. If there are problems with the water quality PDPSC send a request to CERWASS through DARD on the matter and demand for proper action to be taken (treating of water etc.)

Division of responsibilities and co-ordination of work between the province and the district is done on monthly meetings (every 10th day of the month). Based on the reports PDPSC prepare actions to be taken at district level. Except for UNICEF programmes and vaccinations most planning is done on a monthly basis. When there is an outbreak of diseases caused by condemned water, PDPSC will ask the responsible authority to take actions.

IEC is generally performed the following way:

- Campaigns through mass-media;
- Use of mobile amplifiers (loudspeaker on cars);
- Each hamlet has a person responsible for propaganda.

PDPSC instruct the DHC, which then organise CHC to conduct the campaign. In general, campaigns are only conducted when there is an outbreak of disease. Most programmes on environmental sanitation are conducted with financial support from UNICEF. Government campaigns to improve latrine conditions have been conducted through a pilot programme, which introduced clean latrine models in selected communes. The objective was that through experience, the commune people would copy the model and build one on their own. This programme has not been successful.

It seems that the only form of co-operation between CERWASS and PDPSC is through the

¹⁴ The PMC has a contract with CERWASS on testing water from two piped systems - one in Ha Tinh town and one in Hung Son district. The facilities in Ha Tinh town has been financed by the Australian government and the one in Hun Son by USAID.

process of testing domestic water. PDPSCs are part of a educational network managed by the Ministry of Education (MOE) where PDPSCs provide guidance on health education. This is generally done by arranging training courses for teacher on different health issues. The budget is provided by MOE and PDPSC is given a small allowance. In general, IEC budgets are very limited.

Women's Union

A meeting was conducted at the Ha Tinh Women's Union. Participants were the Vice-chairwoman and selected staff involved in RWSS issues e.g. Propaganda Section, Mother and ChildCare Section.

The objectives of Women's Union in connection with RWSS are to:

- Improve local communities awareness of proper environmental sanitation;
- The importance of using clean water and how water can be safe to drink;
- Help women to build clean sanitation facilities

The Women's Union works in a similar way to the other provincial departments e.g through delegation and instruction of district and commune branches of the union. The main implementing unit is therefore at commune and village level. This is done through:

- Regular village meetings with participation from the district or province;
- Organising clubs or task-forces;
- Conduct IEC campaigns and distribute information materials (often provided by UNICEF).

An outline of the organisation is presented overleaf.

The Vietnam women's Union is the most active mass organisation in the RWSS sector. Its main involvement in the RWSS sector is through the implementation of UNICEF projects on community mobilisation. Key activities include:

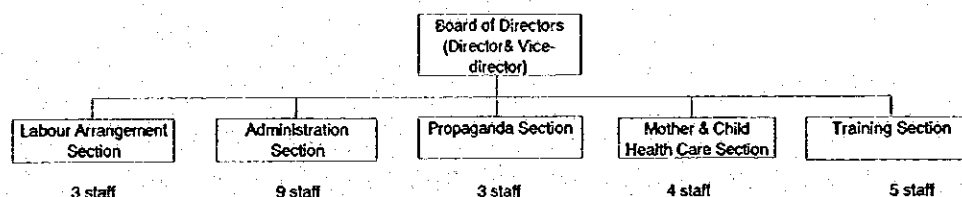
- Creating credit systems for WU members to improve water and sanitation facilities such as buying buckets/jars, building smokeless stoves, latrines and bathrooms;
- Organise revolving funds to build hygienic latrines;
- Training mediators at commune level on management of credit and loan system as well as on IEC for operation and maintenance of RWSS facilities;
- Create network of trainers to promote community mobilisation and participation;
- Organise review workshops and promote campaigns on sanitation and hygiene, an clean behaviour.

In connection with a UNICEF water supply project in Than Ha the Women's Union were responsible for IEC campaigns, and assist the target communes to manage a UNICEF loan to build rain water tanks. The project provides each household a loan equal to VND 500.000 to build rainwater jars. Materials are bought through CERWASS. The amount has to be paid back within two years. The funds returned are then provided to new borrowers. Monthly instalments are between VND 15.000 - 20.000. Main focus is on water supply, while sanitation only receives IEC. This is done through the use of "village counterparts" - village

women specially selected and trained to implement the IEC.

UNICEF booklet - "Clean Water and Environmental Sanitation" is used plus posters are used in the IEC campaign. The booklet is used by the village health counterparts to guide them in their work at village level. The posters are handed out to households as information material. Presently, Women's Union is involved in IEC work of the Danida financed RWSS project in Cam Xuyen district.

Organogram of Women's Union Ha Tinh Province.



Each district has an average of 4 staff, Commune level has 2 and in each village there is one representative. In addition there is a network of "counterpart" women at village level who are used as mediators. Total staff at district level is 10, commune 262 and village 3018.

Other Provincial Institutions Involved in RWSS

Department of Science, Technology and Environmental Protection

The department has a very wide mandate with both regulatory and research functions. Its main activities in the RWSS sector is related to protection of water resources, and in particular industrial pollution and the misuse of pesticides in agriculture production. It has overlapping responsibility with the PDPSC to control water quality standards in order to perform environmental monitoring and control.

Department of Planning (DPI)

DPI is one of the most powerful institutions of the state administration at province level. It coordinates the inputs of the line ministry's sub departments in accordance with the Government' long-, medium-, and annual plans. Advises the Provincial People's Committee (PPC) on budgets for each sector, and exerts an indirect control over expenditures. In each line ministry's provincial departments there is a Planning Section which liaisons directly with DPI. The same occur at district level where DPI is represented by the District People's Committee Planning Section.

Department of Finance (DOF)

DOF is closely connected to DPI. Its main tasks include support and guidance to the PPC in the preparation of the annual budgets and assist in rafting the medium-, and long-term

financial plans. It also participate in the drafting of the annual socio-economic plans and plans for capital investments.

When the different authorities implement their plans DOF provides support and guidance on how to reach targets and provide assistance on management of loans and debt payments. It has the duty to control the finances of self-managed institutions as well as manage the auditing and accounting service for PCC. This includes participation in the evaluation of all projects where foreign funds are involved.

2.5.3 District Level

District People's Committee

The District People's Committee (DPC) represents the executive branch of the district administration of which the Agriculture and Rural Development Section is the main responsible agency for rural development. DPC is headed by the Chairman of the Peoples Committee and assisted by one ore several Vice-chairmen.

An outline of the different sections and staffing of Duc Tho District is used as an example for DPC organisation.

Section/Offices	Staffing
Agriculture & Rural Development	10
Planning & Investment	4
Transport & Construction	6
Culture	3
Legal	2
Labour Arrangement	3
Land Management	6
Finance & Accounting	6
Inspection Board	3
Agriculture Extension Service	4
Social & Handicap	5
Administration	10
Total	62

District Agriculture and Rural Development Office

The meeting was held with the Chief of the District Agriculture and Rural Development Office (DARDO).

The District Agriculture & Rural Development Office is divided into 3 sections staffed with 8 agricultural engineers and foresters and 2 college degrees.

- **Agriculture** headed by 1 Head of Section and supported by 3 staff dealing with: Crop production; Animal Feeding; Control of Co-operatives;
- **Forestry** has 4 staff dealing with: Reforestation (2 staff) and Forest Production (2 staff); One staff is acting Head of Section.
- **Water Resources** has 2 staff dealing with: Water Service (1) and Flood Management (1). One staff is acting Head of Section. The section is only to a very limited extent involved in domestic water for consumption, only for agriculture production. The District Health Centre and CERWASS take care of this function.

During the meeting it was clarified that the main function of the DARDO is directed towards agriculture production. In connection with water supply for agriculture production, DARDO calculate the water needed for irrigation.

Only "some works" are related to domestic water supply mainly in connection with flooding as this might ruin wells or effect wells by other means. Under these conditions DARDO gives advise to the Commune People's Committees on what to do after assessing damages (might recommend testing of water and/or construction of new wells etc.) DARDO then inform the responsible department at district or province level (District Health Centre, CERWASS, Department of Science, Technology and Environmental Protection etc.). During drought DARDO can request CERWASS or a private drilling company to establish new well. This work has to be paid by the communes/households.

DARDO is not involved in any kind of activity related to environmental sanitation.

District Health Centre

Duc Tho is used as an example regarding the role of District Health Centre (DHC) in RWSS. The meeting was held with the Vice-director of DHC. Other participants at the meeting were four experts from DHC, the Chief of the Planning from the People's Committee and four Chairmen of Commune People's Committee.

The DHC reports to the Provincial Department of Health on all professional matters but is also responsible to the District People's Committee on implementing specific district health policies.

A Board of Directors consisting of a Director and two Vice-directors heads the DHC. The DHC is divided into nine sections/faculties:

Section/Clinics	Staffing
Medicine Production Laboratory (Pharmacy)	7
Polyclinic (consultation and medical treatment)	20
Medical Surgery Clinic	15
Birth Clinic	11

Accounting Section	6
Administration Section	14
Family Planning Section	7
Laboratory	13
Disease Prevention & Sanitation Team	15
Total	108

There are 34 Commune Health Centres subordinated to the DHC. Average staffing is 3 nurses of which one is Head of Centre. Total health staff in the Duc Tho district is 210 of which 100 is commune health staff.

The DHC is directly in charge of the monitoring of water quality and the sanitation situation in the district through the Commune Health Centres or directly through the Disease Prevention & Sanitation Team, which is the main responsible unit for RWSS in the district. The DHC also manages a revolving funds set up under the WATSAN Programme (UNICEF) and undertakes promotion campaigns and training of selected community health workers and masons in connection with pilot project on clean latrines.

The Disease Prevention & Sanitation Team consists of 1 doctor and nurses. The main functions of the team are:

- Manage vaccination campaigns;
- Introduce preventive action towards infection diseases;
- Facilitate awareness on environmental sanitation and promote construction of "clean latrines, clean wells, and clean bathrooms.
- Promote proper handling and storage of foodstuff.

These functions are done mainly through the Commune Health Centres (CHC) where DHC send instruction on specific actions to take. The role of the Disease Prevention & Sanitation Team is to make guidance and training to CHC staff, provide information material, monitor and ensure that instructions are implemented.

Commune Level

A field visit was conducted to Duc Yen commune. Meetings were held with the Chief of Commune People's Committee (CPC), Head of Administration Office CPC, and Chief of CHC.

Commune People's Committee

Duc Tho commune consists of 7 villages. The Commune People's Committee has the following sections:

Section/Function	Staffing
Management Board (Chairman and Vice-chairman)	2
Military	2
Police & Security	2
Family Planning & Population	9
Culture & Social Matters	2
Administration	1
Finance & Accounting	2
Land Property	1
Communication, Water Resources & Sanitation	1
Total	22

The Communication, Water Resources & Sanitation (CWRS) represent CPC in RWSS. Together with CHC CWRS implement policies directed from the local and higher level administrative units (district, province and national). CWRS has limited resources and is mostly occupied with administrating circulars and orders, which is passed on to CHC or other responsible local administrative unit.

Domestic water supply is mainly provided through household wells or common wells. CPC involvement in water supply is therefore very limited. Involvement is mostly restricted to protect water source from flooding during rain seasons and close wells if condemned.

Commune Health Centre

The Commune Health Centre (CHC) is organised separately from the Commune People's Committee (CPC). CHC is reporting to the District Health Centre but is also responsible to the CPC who makes plans and implement decisions made by Commune People's Council and district authorities.

The CHC has 3 staff and 1 Chief of CHC. The Chief is responsible for prescription of medical drugs and medicine, 2 nurses are birth maids and the third is responsible for vaccination. General preventive health care is done by all including propaganda on safe water and environmental sanitation. More intensive campaigns are performed upon instructions from the district authorities or the CPC.

Generally, CHC shall perform the following:

- Conduct awareness campaigns together with Commune People's Committee members and village/hamlet chiefs;
- Promote use of clean latrines and how to produce safe water;
- Take regular water samples and dispatch them to DHC for testing.

Monthly reports are sent to DHC upon which meetings are held with DHC and CPC.

No extra funds are provided to perform IEC campaigns. In some cases information material from UNICEF are used. Information campaigns are also conducted by using mass-media communication facilities (each village has a loudspeaker mounted). The CHC is also using Village Health Counterparts, which gets instructions to inform the households on different health issues. Presently campaigns are done in connection with, dinky fever prevention, and AIDS prevention etc.

A country-wide campaign on clean toilets was introduced in 1980. Pilot communes were selected and latrine models constructed with the hope that the households would copy the "clean latrine" model. So far 44 % of the households have established latrines similar to the model. The peak of construction was in the beginning of 1980's, since then many latrine have collapsed due to lack of maintenance. Lack of continues campaigning for clean facilities has also effected household priorities as many find "clean toilets" too expensive.

CHAPTER 3 Field Reports on Operation and Maintenance

3.1 Tù Liêm District, Hanoi

To: Nguyễn Xá village and Phuc Lý village in Minh Khai commune, Tù Liêm district, Hanoi

Date: Saturday 22 May '99.

Team: Hatano, Ellefsen

Counterparts: Ching

People met: Hanoi CERWASS: Chief Technician Mr. ? and ? Vice-chairman of PC Minh Khai commune: Pham Vân Thinh, operator of the water works in Nguyễn Xá village: Mr. Thai

Objectives of the study trip: To address organisational and technical issues in connection with O&M of the water supply system.

3.1.1 Technology

The water work was constructed 1997 under CERWASS supervision (CERWASS made the technical specifications/design 15 while construction was done by a State Construction Company.

It is a biological treatment plant with aeration tower, biological filter tank, clearing of water through gravity and storage tank. The biological filter is made of granulated Styrofoam. According to Mr. Hatano the aeration tower is interfering the biological process of the plant and is reducing the effect of the biological filter to a mechanical filter (aeration should only be used in connection with mechanical treatment plants using rapid sand filters (??))

Present production capacity:	18m ³ /hrs
Well depth:	63 m
Water extraction (pump) capacity:	28 m ³ /hrs

15 On the technical drawings it said Centre for Environmental Technical and Urban Industrial Zone.

Booster pump capacity:	25 m high
Operating time:	5 - 7 hrs. in the afternoon
Number of households served:	300
Present daily production:	100 m ³ /day (design capacity 20m ³ /hour)
Max plant capacity:	300 m ³ /day

3.1.2 Finances of Construction

Construction costs of treatment plant:	490 mill. VD
Construction costs for piping system:	300 mill. VD
Total construction costs approximately ¹⁶ :	800 mill. VD

Funds from state budget. Connection fee/contribution from the connected households: 200.000 VD

3.1.3 Organisation

The construction was organised by CEWRWASS. After the completion of the water works it was handed over to the PC which then delegated the O&M responsibilities to the agricultural co-operative in the commune. The village households are connected to the co-op, which provides a number of services to its members/workers including water supply. Formally the co-op is owner of the water works. The Chairman of the co-op is also the manager of the water works.

By-laws for the water works is elaborated by the co-op. The PC do not have a copy of the by-laws (the Chairman of the was not available that day so the by-laws could not be addressed).

There are two operators. According to Mr. Thai, one of the operators, they were in charge of the plant a month each. According to PC both operators were full-time. One did the O&M of the plant while the other controlled the piping system, did meter reading and collected water fees. Most likely they shared these positions and interchanged according to their own decisions. The PC selected the operators.

The operators were trained by CEWRWASS on how to O&M the plant. He has a background

¹⁶ The PC and CERWASS have different calculation of cost (might relate to budgeted costs and real costs)

as an army technician - now retired. Non of the operators or commune people did participate in the construction of the plant.

No WATSAN committee has been established.

3.1.4 Operation & Maintenance

Plant Operations

The operator comes in the morning and cleans the surroundings of the treatment plant and cleans the filter. He then returns in the afternoon and turns on the pumps. The operator is only part-time at the treatment plant. When he is not there the access to the plant is closed/locked.

The water is provided 6 - 7 hours per day. An instruction on how to turn on the pumps is posted on the wall.

There are two pumps: one well pump and one booster pump. The pumps and motors are Russian made, but very command in Vietnam. Spare parts are not a problem to get.

Only a meter controlling the pressure in the pipe system is mounted. If the pressure gets to high, a safety valve can be opened returning the water to the storage tank (an equalisation/pressure tank is to be constructed in the future). No meter is mounted to measure the water sent into the water network. This has to be calculated. Presumably not done on a regular basis. Total water production/consumption is calculated from collected date from household water meters.

No electrical meters are mounted in the plant, but outside on the electrical pole. The Electricity Company can only access it.

Water quality is not controlled. The District Health Centre did this when the plant was completed only. CERWASS does not control water quality.

Meters are read each month. Double accounting system is used: the households keep a record book and the operator/meter reader keeps one. The operator is responsible for calculating and collecting the water fees. The collected money is handed over to the co-op treasurer/accountant.

A Logbook is kept but not available at the plant (!). Time of operation is recorded and special incidents/problems. The operators report to the PC/co-op monthly orally.

So far the operation of the plant is satisfactory. The major problem is that the filter can not filter enough water.

Plant Maintenance

The filter (natural bacteria film) is cleaned every day through a simple mechanical system, which washes the filter. The cleaning takes about 40 minutes.

The booster pump and its electrical motor are greased regularly. The water extraction pump is checked every 2 year when it is taken out of the well. Silt is cleaned through gravity provided by the storage tank. How often not mentioned.

Major maintenance is done two times a year. The booster pump is then disassembled, cleaned and checked. Any worn-out parts are changed. A spare pump was located in the pumping house, which is used as a replacement during maintenance.

A limited item of spare parts is kept at the operator(s) house (not at the plant!) including basic tools for maintenance and repair including water meters and some PVC pipes for replacing leaking pipes. If spare parts has to be bought the operator has to get the money from the PC/co-operative budget.

No maintenance is done on the buildings. After two years of operation they seem to need more care.

O&M of Piping System and House Connection

The village people are obliged to report any leakages. The operators control water meters and the piping system when they read the meters.

The operators are capable to make new house connection upon request from households. The procedures for this was not clear (how to apply/register). Connection fee is VD 200.000. Water meter costs VD 100.000.

Pipes can be bought at the market and easily accessible.

O&M Support

CERWASS provide O&M support on request.

3.1.5 Household Connection and Consumption

This is the first plant constructed in the commune. The village was selected on the basis of salty ground water from shallow wells. The PC was informed about the possibilities of receiving water supply from the District Peoples Council (Agriculture Department, Planning and Investment Section) upon a formal request was sent to CERWASS. Tests were made and recommendations given by CERWASS. The PC took the overall selection of village to receive water supply.

Village meetings were held by the PC to inform about the possibility of having a water supply system if the households were willing to contribute to the project. Discussions on water tariffs were held in order for the households to make a decision. Household contribution includes payments for secondary piping system (mandatory to be connected) and house connection fee. The tariffs agreed on at that time did not cover O&M cost so the PC/co-op had to subsidise the cost of O&M. The tariff was raised April 1999, but covers only salary and electrical costs.

Connection fees:	VD 200.000
Water meter:	VD 100.000
Tariff:	VD 1.600/m ³
Average consumption:	5 - 7 m ³ /month (200l/day or 50l/person/household)

The households have water storage tanks (1 m³).

Size of village:	400 households
Households connected:	300 households
Average monthly income/household:	400 - 800.000 VD/month

According to the PC the households are not satisfied with the amount of water, but the majority have not the possibility to pay more (presently 100 households can not afford to connect).

The household visited at noon had sufficient water in the storage tank (water supply is not provided until the afternoon) and was contempt with the amount of water supplied.

Water quality at household level is controlled by Hanoi Health Department to detect water borne sicknesses. The operators take no regular samples.

No campaigns are done to attract more household connections.

3.1.6 O&M Costs and Financing

The co-op is financially responsible for the water works. However, the PC sets water tariff. The co-op's accountant does financial management and accounting.

Operator salary is VD 230.000/month. In addition one of the operators get army pension of VD 370.000/month.

The water fees are presently only covering the day-to-day operation of the treatment plant (salaries, electricity and small maintenance items). Depreciation is not used to build up a replacement fund. The PC has no idea/plans on how to meet major replacement costs.

O&M Budget:	VD/month	
Salaries	VD 230.000/month x 2	= 460.000
Electricity	VD 700/kw	= 600.000
Other items		= 100.000
Total monthly costs		= 1.160.000
Income from water fees:	VD 1.600/m ³	= 2.000.000
Revenue		= 800.000

The revenue is kept in a separate account and is to be used for major repair of the water works.

Visit to Water Works in Phuc Lý village

This water work was newly constructed and the distribution system was not completed so the plant was not in operation. The operator was not to be found so detailed information of the plant could not be received.

The technical design was a conventional mechanically treatment plant with aeration tower and rapid sand filter operated by a pumping system.

Hanoi City Council funded the plant and CERWASS has not been involved in the establishment of the plant. Estimated cost of plant is 300 mill VD.

3.2 Study Trip to Thai Nguyễn Province

To: Chũe Hang commune, Dong Hy district and La Hien commune, Vo Nhai district, Thai Nguyễn province

Date: Monday 24 and Tuesday May '99.

Team: Dr. Hoang, Ellefsen

Counterparts: non

People met:

Provincial CERWASS: Vice-director Dang Huy Thanh and Chief of Technical Section Mr. Thanh

Chũe Hang commune, Dong Hy district: water works operators (2), PC Vice-chairman Mr. Bah and Head of Technical Section Dong Hy District PC, house connection representative Ms. Doan Groups 7 Chua Hong Town.

La Hien commune, Vo Nhai district: Head of Lang Lai village, water users.

Objectives of the study trip: To address organisational and technical issues in connection with O&M of the water supply system.

3.2.1 Chũe Hang commune, Dong Hy district

(1) Technology

The water work was constructed 1970 and until 1996 was used by a nearby cement factory/quarry company when Dong Hy District PC bought the water works with support from UNICEF which provided the piping system.

The water facility is serving a semi-urban area.

A natural spring was used as water source but the protection of the source was not good introducing contaminated water into the water intake (e-colie bacteria). The spring was shared by the intake from a nearby quarry plant. The source pump facilities was constructed in 1965 providing water to the nearby industry without any treatment.

It is a mechanical/biological treatment plant with a biological filter tank, clearing of water through gravity and storage tank.

Spring capacity:		not known
Water extraction (pump) capacity:	45 m ³ /hrs	
Present production capacity:		280 -300 m ³ /day
Treatment capacity		60 m ³ /hrs
Operating time:		5 - 7 hrs. from
7.30 in the afternoon		
Number of households served:		370
Total number of households		1200 in town

Pumps are Chinese origin. Finances of Construction

Item	Cost	Financing source
Treatment plant	200 mill. VD	PC (bank-loan 157 mill. VD the remaining loans from consumers).
Construction costs for piping system	314 mill. VD	UNICEF plus connection fees
Total costs	614 mill. VD	

Connection fee/contribution from the connected households: 200.000 VD. Tariff 2000 VD/m³ covering O&M plus interest and repayment of loan. Total water fee collection per month is estimated to 60 mill VD. 10 mill. VD is collected monthly from households and institutions. It is not sure the amount paid by private connections/households. Visit in one household stated that average consumption per month for a family of 8 people used 20 - 30 m³/month equal to VD 60.000/month for water consumption. It is estimated that the households counts for 1/3 of income from water fees. The remaining income should come from government offices, shops and institutions.

(2) Organisation

The construction of the distribution system was organised by CEWRWASS. After the completion it was handed over to the PC. The responsibilities for O&M lies with the Electricity and Water Supply Section.

Two operators do daily O&M. The operators used to be employed by the cement factory and have been working at the plant since construction. They were trained by how to O&M the

plant by their former employer.

Two persons do fee collection, one responsible for meter reading the other for calculation of fees. Payments are organised at the spot of reading. Receipts are given as proof of payment.

There are no by-laws for the water works elaborated.

There are two operators. According to Mr. Thai, one of the operators, they were in charge of the plant

No WATSAN committee has been established.

(3) Operation & Maintenance

Plant Operations

The condition of the water intake/pumping facilities was in a reasonable good condition. A poster on the wall described the operational and maintenance routines. The O&M duties included turning on the power and checking the operation of the motor and pump. Lubricate and listen for "bad noises" from the pump/electro-motor. No meter was mounted to measure pressure and production. Electrical meter provided on the wall. Was not check, only by the electric company.

There are two pumps: one well pump and one booster pump. The operator comes 7.30 in the morning and turns on the pumps. The pumps work until two a clock in the afternoon.

The water is provided 6 - 7 hours per day. An instruction on how to turn on the pumps is posted on the wall.

Water quality is not controlled at intake level.

The treatment plant is in a bad condition. According to the operator it is not working and water is just going through the system without any cleaning process. The filter has never been cleaned since construction (1970). The plant used to be equipped with a chlorinating system, but the system has failed to operate. There is no funds for chlorine or any maintenance work at the plant.

Plant Maintenance

Maintenance is not performed regularly. The plant was in a bad condition. Repairs are done when there is a breakdown.

A Logbook is kept but not available at the plant (!). The operators report to the PC/co-op monthly orally.

The booster pump and its electrical motor are greased regularly.

No spare pump was located in the pumping house, to be used as a replacement during maintenance. Using Vietnamese motors.

No spare parts are kept but can be bought in town. Basic tools are kept the operator(s) house (not at the plant. If spare parts has to be bought the operator has to get the money from the PC/co-operative budget.

No maintenance is done on the buildings.

For major repair professional assistance can be found in the town.

O&M of Piping System and House Connection

The users are obliged to report any leakages. The fee collectors control water meters and the piping system when they read the meters.

The operators are capable to make new house connection upon request from households. The procedures for this was not clear (how to apply/register). Connection fee is VD 200.000. Water meter costs VD 100.000.

Pipes can be bought at the market and easily accessible.

O&M Support

CERWASS provide O&M support on request.

(4) Household Connection and Consumption

House-meters are read each month. Double accounting system is used: the households keep a record book/receipts and the operator/meter reader keeps one. The operator is responsible for calculating and collecting the water fees.

This is the only plant constructed in the commune. The PC bought the plant in 1996. Only 370 households out of 1200 are connected. The PC is considering making a contract with an Australian firm, which will invest in a new water supply system and run the facility on

commercial basis. Profits will be shared with the PC.

The water supply is a service provided by the PC. No active involvement of the consumers at any stage of the project cycles except that the PC borrowed money from the household to finance the water supply facility. The PC is now repaying the loan.

Connection fees:	VD 200.000
Water meter:	VD 100.000
Tariff:	VD 2.000/m ³
Average consumption:	5 - 7 m ³ /month (200l/day or 50l/person/household)

The households have water storage tanks (1 m³).

Size of village/town	1200 households
Households connected:	370 households
Average monthly income/household:	800.000 - 1 mill. VD/month

According to the PC the households are satisfied with the amount of water, but the price is too high. If price is raised the majority of the consumers will pay more as the access to water otherwise is limited.

Water quality at household level is not controlled if water borne sicknesses. The operators take no regular samples.

No campaigns are done to attract more household connections at present stage.

(5) O&M Costs and Financing

The fees collected is handed over to the co-op accountant, who deposits the money at the state treasurer (all public finances has to be handled/controlled by the state treasurer). The PC can then use money according to its budgets. Any surplus is kept at the bank. Separate account is used for the water supply facilitate. In principle the PC can use own collected revenues according to its own priorities/budgets. In this case savings are used for buying new spare parts.

The PC is financially responsible for the water works and sets water tariff. The PC accountant does financial management and accounting.

Operator salary is VD 200.000/month. In addition one of the operators get pension from the

cement factory.

The water fees are presently only covering the day-to-day operation of the treatment plan (salaries, electricity) and payments on loan. Depreciation is not used to build up a replacement fund. The PC has no idea/plans on how to meet major replacement costs.

O&M Budget:	VD/month	
Salaries	VD 220.000/month x 2	= 440.000
Electricity	VD 700/kw	= 600.000
Other items		= 100.000
Total monthly costs		= 1.160.000
Income from water fees:	VD 2.000/m ³	= 60.000.000
Revenue		= 58.860.000

The revenue is kept in a separate account and is to be used for major repair of the water works.

3.2.2 Visit to Water Works in La Hlen commune

(1) Technology

Gravity system uses mountain spring as source (125 msl) with capacity of 120 m³/day (dry season capacity). Distance from spring to last consumer is 3 km. Total length of piping system 4,6 km.

The technology is simple for and appropriate as low-cost system managed by two hamlets. No treatment of water is done, only a sand sedimentation tank is provided at the source to prevent siltation of valves and water tanks.

The water flows by gravity to 11 collection tanks (45 m high. Two tanks have a capacity of 5 m³ the rest of 2 m³.

The storage tanks are equipped with automatic water hose, but the water has to be turned on/off manually as the automatic water hose is of a low quality and out of order.

The 2 m³ water tanks has attached 3 water taps the 5 m³ water tanks has 6. PVC pipes were connected to the taps working as house connections.

The construction was commissioned in 1998 and completed in Marts 1999.

(2) Finances of Construction

Total cost of construction was VD 200 mill.

Financing sources:

Government funds	60%
UNICEF	30% (providing 4,5 tons of cement and 250kg iron for reinforcement)
Village	10%

(3) Organisation

The project was initiated by the Commune PC who sent a request to the District PC, which forwarded it to Provincial PC and Department of Agriculture and Rural Development and provincial CERWASS. As the part of the funding comes from UNICEF it is envisaged that requests initially came from national level (Central CERWASS) to the Provincial PC/CERWASS. Surveys were then conducted by Provincial CERWASS (technical and socio-economic). Design of the system and mobilisation of the people of the two villages followed this.

Several meetings were held before construction started with the villagers. Sometimes the meetings included all village people, commune PC and CERWASS and representatives from different unions.

During construction a Construction Committee was established including Chairman of the Commune PC, village heads, and provincial CERWASS.

A "private" construction company did construction. The villagers participated in digging trenches and related labour inputs.

Main requirement for receiving the project was limited access to groundwater during dry season (well 20 meters dry) as well as a considerable time was used to collect water at the well (very hilly and long walk).

There is a system of "priority" households and "normal" households. "Priority" households contain between 3 to 6 households and are responsible for water O&M of water valves. They are linked to 2 m³ water tanks. The 5-m³ can contain as many as 55 households (they complained about restricted access to water).

The area has bad ground water source and has been using the spring as main source. Access to spring is difficult and a lot of time is used to get safe water. The village contacted the Commune PC about assistance for water supply, which then contacted District PC, and Provincial Department of Agriculture and Rural Development. Surveys were conducted by CERWASS and applications made for funding. CERWASS made design and organised construction

(4) Operation and Maintenance

The Head of the Hamlet/Village is responsible for O&M of the system, which is very simple. The main operation is connected to regulate the water flow so all tanks are filled regularly. Maintenance includes cleaning of water tanks and change washer etc. According to CERWASS the household closest to the water tank functioned as caretaker. Asking the household, however, they were not quite sure about the responsibility, but referred to the village head.

So far the system has only been operating for 6 months and no major problems except for damage of the automatic water level regulators due to low quality (rusted). Provincial CERWASS comes and control the system every 3 months and reports to Central CERWASS and UNICEF.

(5) Household Connection and Consumption

250 households receive water from the system plus a school with 1000 pupils. The system was initially constructed as public taps, but a number of households have connected PVC pipes to the taps.

(6) O&M Costs and Financing

The water fees were not yet finally settled as no instructions have been given from the PC. An interim tariff of 1000 VD/m³ has been introduced to pay the operators (30.000VD/month). Additional 30.000 VD/months were deposited and to be used for spare parts. The village head keeps the deposits.

3.3 Study Trip to Gia Vien District, Ninh Binh Province

To: Ninh Binh Province: Gia Vien District:

Date: Friday 28.5 and Saturday 29.5.99

Team: Dr. Hoang, Hotano and Ellefsen

Counterparts: Mr Ching CERWASS

People met:

Provincial CERWASS: Director Toan and Mr. Su and Mr. Thanh Technical Department (accompanied on trip to Gia Sinh commune and Gia Hoa commune respectively).

PC of Gia Sinh commune and Gia Hoa commune

Operators and households at commune level.

Objectives of the study trip: To address organisational and technical issues in connection with O&M of the water supply system.

3.3.1 Gia Hoa Commune, Gia Vien District

(1) Technology

The construction of the treatment plant and piping system was started in 1977 and completed in April 1999 but not yet put in operation. The design was done by the Design Institute of MARD in Hanoi although Ninh Binh CERWASS is one of the three provincial branches that have permission to make design¹⁷ but policy is centralising design works. Ninh BINH CERWASS did all investigation and pre-design as well as managing construction. The constructor selected seems to be doing a competent job. According to the UNICEF Evaluation¹⁸ closer supervision of construction would have been an asset as costs have raised to over 80% of original budget estimates.

The water facility is serving 9 out of 16 villages in the commune. The 9 villages have a total population around 4.800 people divided into 1150 households.

¹⁷ The two others are Thanh Hoah and Nam Dinh provincial CERWASS

¹⁸ Evaluation of the PP Component of the UNICEF Assisted WSS Programme in Vietnam.

The water source is located at a large marshy pond located at the base of the limestone-mountain in an unpopulated area. The water source is not fenced or protected and thus exposed to contamination by domestic animals that drink from it. Water test indicate high bacteria content.

The water intake consists of a sub-surface horizontal concrete pipe connected to a vertical chamber. Water is collected at 4 meters depth. The pump-house was complete with a dual pump system, meters for pipe pressure, water meter, and electrical meter on switchboard.

From the intake pump the pipeline leads to the treatment plant and booster pumping station, located in Loc Luong Village about 600 meter away. Water treatment is a mechanical treatment plant based on rapid sand and chlorine injection after filtration.

The treatment plant had to be modified after construction completed as design did not meet required specifications. This has increased construction costs as well as made the whole construction period too long (two years). The treatment plant consists of a 200 m³ filtration tank divided into two separate sand filter systems so there is possible to have continues production while one chamber is cleaned (back-washed). The filtered water proceeds to the pump house containing a dual pumping system and a chlorine injection system. The chlorine was (is to be) produced by electrolyses of NaCl producing Chlorine gas injected into the filtered water. The chlorine system was not properly secured and the operator was not aware of the danger working with chlorine gas (he was sleeping in the same room!). The Team was told that he had applied for operator training which is to be organised by UNICEF for all operators in the province.

The second booster pumping station is situated in a school compound about 2 km from Loc Luong. The school is to have 1500 pupils. It is not certainty if the school is to pay for the water it received. A reservoir with 60 m³ has been completed, but is not large enough to function as reserve storage when the booster pump at the treatment plant is shut down.

Spring capacity:	180 - 250 m ³ /hrs
Water extraction (pump) capacity:	45 m ³ /hrs
Present production capacity:	m ³ /day
Treatment capacity	m ³ /hrs
Boost capacity	54 m high - 15 m ³ /hrs
Operating time:	hrs. from
Number of households to be served:	1000

Designed capacity:	1000
Total number of households	5000 - 24 villages

(2) Organisation

The project was initiated by the Commune PC who sent a request to the District PC, which forwarded it to Provincial PC and Department of Agriculture and Rural Development and provincial CERWASS. As the part of the funding comes from UNICEF it is envisaged that requests initially came from national level (Central CERWASS) to the Provincial PC/CERWASS. Surveys were then conducted by Provincial CERWASS (technical and socio-economic). Design of the system and mobilisation of the people of the two villages followed this.

Several meeting were held before construction started with the villagers. Sometimes the meetings included all village people, commune PC and CERWASS and representatives from different unions.

During construction a Construction Committee was established including Chairman of the Commune PC, village heads, and provincial CERWASS. The village heads were responsible for mobilising people to participate in construction.

A "private" construction company did construction. The villagers participated in digging trenches and related labour inputs.

Main requirement for receiving the project was limited access to groundwater during dry season and considerable time was used to collect water at the nearby river.

The construction of the water supply system was organised by CERWASS.

After the completion it was handed over to the PC and the responsibilities for O&M lies with PC. Mr. Dinh Ba Dai, the Vice-chairman of the CPC is responsible for the day-to-day management of the water supply system while an other member of the PC has the responsibly for technical aspect.

The O&M is done by a team of 6 persons:

- 3 operators (one at the intake, one at the treatment plan and one at the second boost station);
- 3 persons are responsible for monitoring pipelines, reading water meters, and perform fee calculation and fee collection.

The leader of the team is a trained mechanic. The challenge will be to communicate with the customer/end-users to better understand their needs and keep them informed about water issues.

As a proof of payment receipts are to be given.

There are (no) by-laws for the water works elaborated.

(3) Operation & Maintenance

Plant Operations

As the system still needs to be put in operation, no O&M issues could be assessed in terms of operational experience. The operator still needed to attend training arranged by UNICEF.

It is expected that the sand will be washed every 2 day inter-changing the operation of the two chambers.

10 kg of salt will produce enough chlorine gas for 30 hours of operation. No posters on the wall informing about how to handle the chlorine injection system or O&M in general are visible.

To measure pressure and production was meters mounted including electrical meter for power consumption.

Logbook system for recording O&M is not yet introduced.

Plant Maintenance

Not performed at this stage, as production not started.

O&M of Piping System and House Connection

The users are obliged to report any leakage to the caretakers or the fee collectors. Control of water meters and the piping system is done by the O&M Team.

New house connections are made upon request from households, which has to apply/register at the PC.

Connection fee covers cost of pipes and water meter (water meter costs VD 100.000). Pipes can be bought in Ninh Binh and are easily accessible. Pumps are of Vietnamese origin.

O&M Support

CERWASS provide O&M support on request.

(4) Household Connection and Consumption

The residents of the nine villages concerned were made aware of the project prior to the start of construction and that they would be expected to contribute. The amount was not clear at the time. No cross-subsidy system has been introduced for the poorest segments of the population. Average income per household is between VD 500.000 and VD 1 mill. No campaigns are done to attract more household connections at present stage.

House-meters are to be read each month and followed by billing. 3 persons do reading and one does calculation while fee collection. Receipts are given.

The households have constructed water storage tanks (1 - 2 m³) to use as buffer.

(5) O&M Costs and Financing

Finances of Construction

Financing source	Cost
Government funds	800 mill. VD
UNICEF	60 mill. VD
People's contribution *)	500mill. VD
Total costs	1.360 mill. VD

*) 70.000 VD/household member from 1000 households. However, only 10% were able to pay the full amount. The remaining had to borrow the money from the PC and pay back in small instalments.

Average connection fee is VD 300.000 and covers the cost of pipe from main pipe to house and water meter. Labour comes in addition if the household does not do it. So far most households were only able to pay 70% of connection costs. To cover the remaining costs the households were forced to lend/owe CERWASS. The connections were done by CERWASS.

Tariff is set at 1500 VD/m³ covering O&M plus interest and repayment of loan.

The money is to be deposited at the bank under control by the state treasurer (all public finances has to be handled/controlled by the state treasurer). The PC can then use money according to its budgets. Any surplus is kept at the bank. Separate account is to be used for

the water supply facilitate. In principle the PC can use own collected revenues according to its own priorities/budgets. In this case savings are used for buying new spare parts. PC sets water tariff and accounting.

Operator salary is VD 200.000 /month. In addition the operators have pensions from former employment.

The present water fees is to covering the day-to-day operation of the treatment plan (salaries, electricity) and payments on loan. Depreciation is not used to build up a replacement fund. A stipulated budget is outlined below based on preliminary figures.

O&M Budget:	VD/month
Salaries	VD 200.000 x 6 = 1.200.000
Electricity	VD760/kw/hrs x 14 kw/hrs x 3 x 8 x 7 x 4 = 7.200.000
Other items	= 500.000
Total monthly costs	= 8.900.000
 Income from water fees:	 VD 1500 /m ³ x 5 x 1000 = 7.500.000
Revenue	= - 1.400.00

A breakeven is occurring if water fee is raised to VD 1.800 and 1000 connection.

3.3.2 Gia Sinh Commune, Gia Viên District

(1) Technology

The water work was completed in April 1999 and presently serving 135 households out of 1550. The water source is well. Totally there are 11 villages in the commune, but only 4 villages are connected to the water supply system. The capacity of the well should be sufficient for 8 villages but lack of finances limits further extension.

Water treatment is a mechanical/biological treatment plant with a, biological filter tank, clearing of water through gravity and storage tank. Distribution is done in two ways: booster pump and gravity system.

Well depth: 34 m
Water extraction (pump) capacity: 16 m³/hrs

Present storage tank capacity:	30 m ³ /day
Treatment capacity	30 m ³ /hrs
Operating time:	4 hrs 7 day during rain season only every second day.
Number of households served:	135
Total number of households	1550

Pumps, pipes, water meter etc. origins from Vietnam.

(2) Organisation

The construction of the distribution system was organised by CERWASS with support from UNICEF. Construction Company No. 9 in Ninh Binh did the construction.

The responsibilities for O&M lies with the CPC. There are (no) by-laws for the water works elaborated.

Staffing consists of 1 operator plus 1 electrician and 1 repairman do daily O&M. According to CERWASS did the operator participate in construction. PC accounting section does the O&M accounts.

Limited training has been given towards O&M and overall management of the water supply system. Focus has been on peoples contribution daily operation of the pumps plus how to read water meters and calculate fees. CERWASS will, according to the Director, continue to support the O&M of the system upon request. Post-construction training is in a great need and should be apply as soon as possible. According to CERWASS UNICEF will organise training in 1999 for operators from the whole province.

Meter reading and fee calculation is done by 4 people (one from each village) who also check illegal connections and reports this to the PC which then is to fine the violators. As a proof of payment receipts are given. Talks with the PC reveals that a "standard" water tariff of VD 1.500 has been applied without any calculation of real costs for O&M.

Although an organisation of the water supply has been established, it is not able to manage the water service sufficiently.

(3) Operation & Maintenance

Plant Operations

During the dry season 4 hours of pumping per day while during rain season only pumping every second day as people seems to use rain water to compensate household costs.

The operator was not available to it was not possible to get a description of operational and maintenance routines. No job description was available at PC.

Pumps: There are two pumps: one well pump and one booster pump. The water is provided 4 hours per day during dry season and every second day during rain season.

Plant Maintenance

The water intake/pumping facilities seem to be in good condition. As the operator was not available it was not possible to assess maintenance routines.

For major repair professional assistance can be found in the Ninh Binh. On request Ninh Binh CERWASS will give advice on O&M issues.

O&M of Piping System and House Connection

A person does control of water meters and the pipes from each of the four villages. The team discovered that parts of the pipeline was exposed openly and thus can easily be damaged by hum activity.

O&M Support

CERWASS provide O&M support on request.

(4) Household Connection and Consumption

The repairman upon request makes new house connections from households. The households have to buy connection pipes and water meters and dig the trenches (connection fees). Permit to connect is issued by the PC upon completion of the connection with water meter. Water meter costs VD 100.000 and pipes can be bought in Ninh Binh or at the local market.

At the time of visit the water supply system was not in operation, and the operator was not to be reached. According to households visited, the operator turned on the supply every second day during the rainy season as people, to his opinion, have access to sufficient rainwater (!). It seems that the organisation of the O&M is facing major difficulties and that the management does not have sufficient knowledge towards the needs of the consumers. The limited time of operation since construction was completed indicates that not sufficient training has been directed towards the managerial aspects of the water supply.

The system suffers from a number of illegal connections which has increased production costs and thereby caused the PC to hire 3 people responsible for checking house connections and

disconnect those who does not install water meter and pay the water fees. Fines between VD 10.000 - VD 20.000 is to be issued to illegal connectors. Continues violation will increase the fine to VD 50.000.

Until now only 135 out of 1550 households have been connected legally to the system. Each household has a water storage tank roaming 1 m³.

Latest water fee collection figures indicates that only 262 m³ of water was registered as sold indicating average monthly household consumption less than 2 m³. Visits at household level indicates however consumption between 4 to 6 m³ since the system started its operation (been running for 6 weeks at that time). According to the PC propaganda will be intensified to get more legal connectors. In the meantime the PC has closed water distribution to force households to connect, in the mean time households rely on rainwater and water from shallow wells. This is causing a dilemma, as households are not encouraged to connect. Instead already legal connectors are punished, as they are not receiving any water. If not more household is legally connected in the near future the financial sustainability of O&M will be jeopardised.

The water quality at household level is not controlled for water borne sicknesses. No regular water samples taken.

(5) O&M Costs and Financing

Major financial contributor is the Government through it Special Funds for Mountainous Areas.

Finances of Construction

Financing source	Cost
Government	290 mill. VD
UNICEF	70 mill. VD
People's contrubution	130 mill. VD
Total costs	490 mill. VD

Contribution from the households includes digging trenches. It is not clear how many households participated in this or how effective this was.

Tariff 1.500 VD/m³ covering O&M. Average household consumption per month for between 2 - 5 m³/month equal to VD 3.000 - 7.500/month for water consumption. Present total water

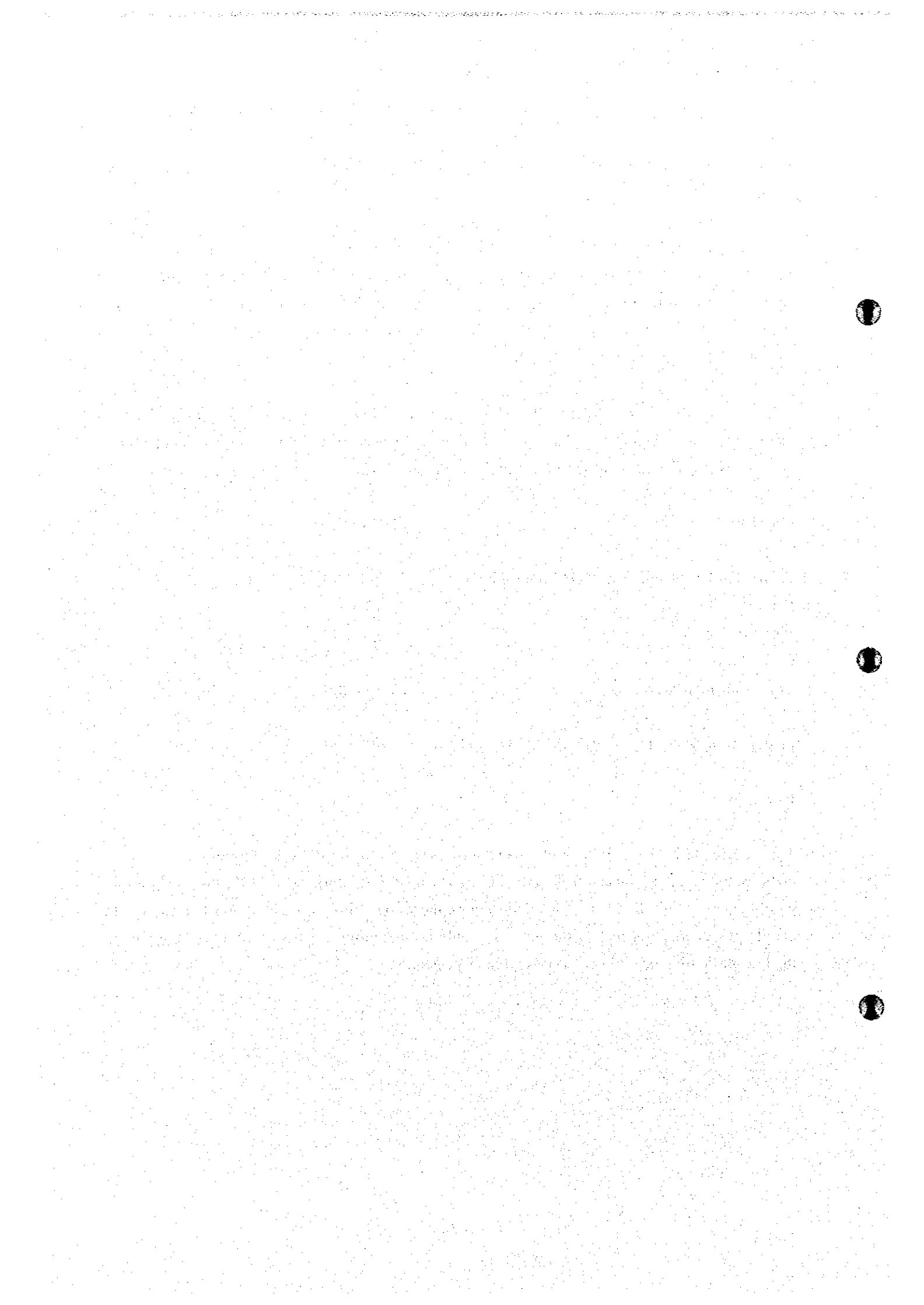
fee collection per month is estimated to VD 1 mill. Latest collection only VD 400.000 was collected.

The fees collected are handed over to the PC treasurer/accountant. The money is deposited at the bank under control by the state treasurer (all public finances has to be handled/controlled by the state treasurer). The PC can then use money according to its budgets. Any surplus is kept at the bank. In principle the PC can use own collected revenues according to its own priorities/budgets. Operator salary is VD /month.

The present water fees covering the day-to-day operation of the treatment plan (salaries, electricity) and payments on loan. Depreciation is not used to build up a replacement fund. Has the PC idea/plans on how to meet major replacement costs.

O&M Budget:	VD/month
Salaries of O&M staff VD 100.000/month x3	= 300.000
Plant operator	= 120.000
Electricity	= 700.000
Other items	= 60.000
Total monthly costs	= 1.260.000
 Income from water fees: VD 262 x VD 1500 /m3	 = 400.000
 Revenue	 = -867.000

There seems to be a totally lack of financial overview from the PC side. Presently, a number of households have connected illegally to the net raising operational cost through increased pumping. Although the PC has decided to close the water supply on a temporarily basis until people pay connection fees (although it has only been running for 6 weeks) it will not solve the lack basic understanding of financial management.



CHAPTER 4 List of Abbreviations

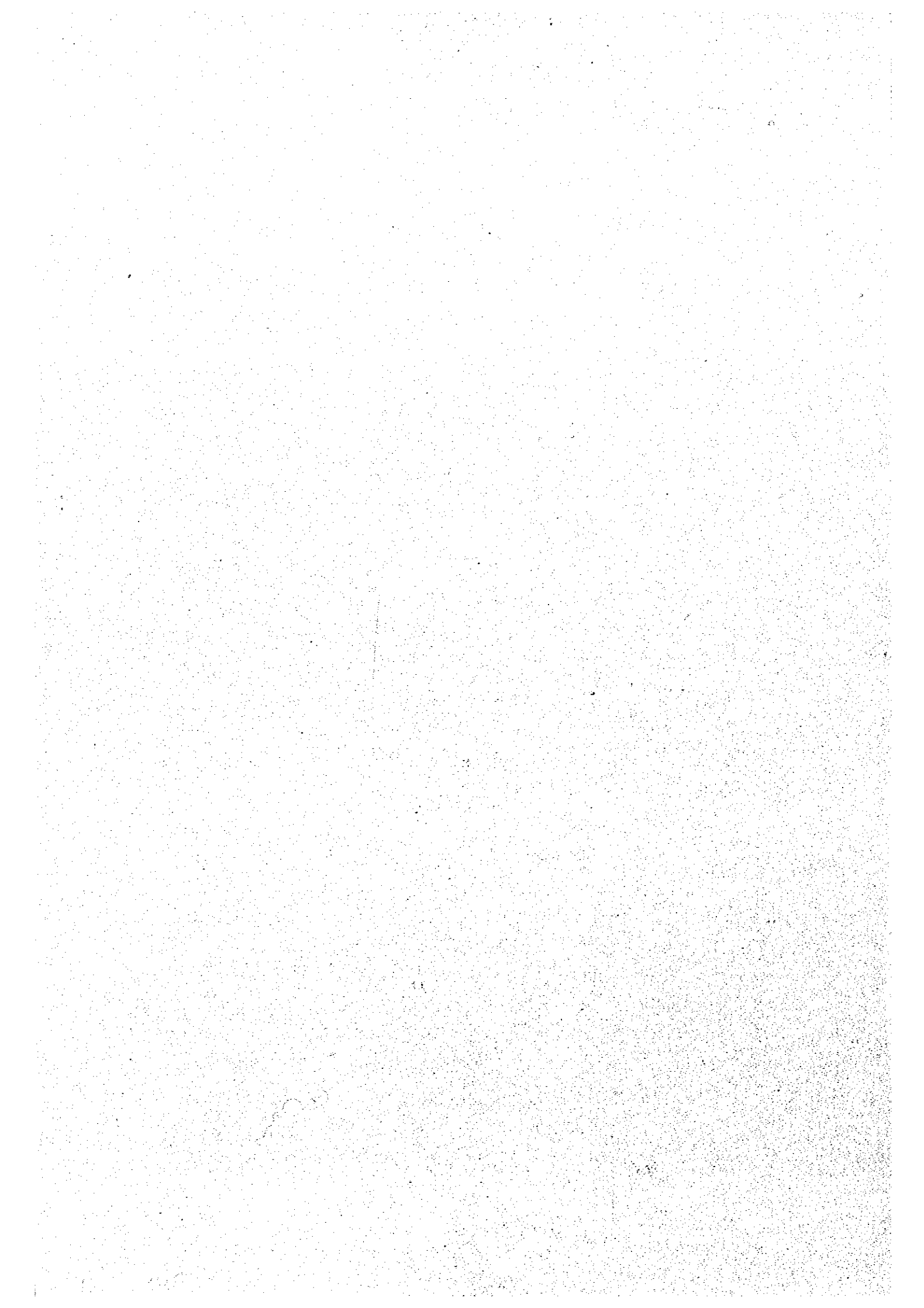
CERWASS	Centre for Rural Water Supply and Environmental Sanitation
CHC	Commune Health Centre
CPC	Commune's People's Committee
Danida	Danish International Development Assistance
DAO	District Agriculture Office
DARD	Department of Agriculture and Rural Development
DARDO	District Agriculture and Rural Development Office
DHC	District Health Centre
DOF	Department of Finance
DOH	Department of Health (provincial level)
DOSTE	Department of Science, Technology & Environment
DPC	District Peoples Committee
DPI	Department of Planning & Investment
HRD	human resources development
IEC	information and education campaign
MARD	Ministry of Agriculture and Rural Development
MOE	Ministry of Education
MOF	Ministry of Finance
MOLISA	Ministry of Labour, Invalids and Social Affairs
O&M	operation and maintenance
PDPSC	Provincial Disease Prevention and Sanitation Centre
RWSS	rural water supply and sanitation
UNICEF	United Nations Children's Fund
VND	Vietnam Dong
WATSAN	water and sanitation
WU	Women's Union

Project Implementation - Organisation and Capacity Building Component of Inception Phase, Capacity Building at National and Provincial level plus Pilot Commune

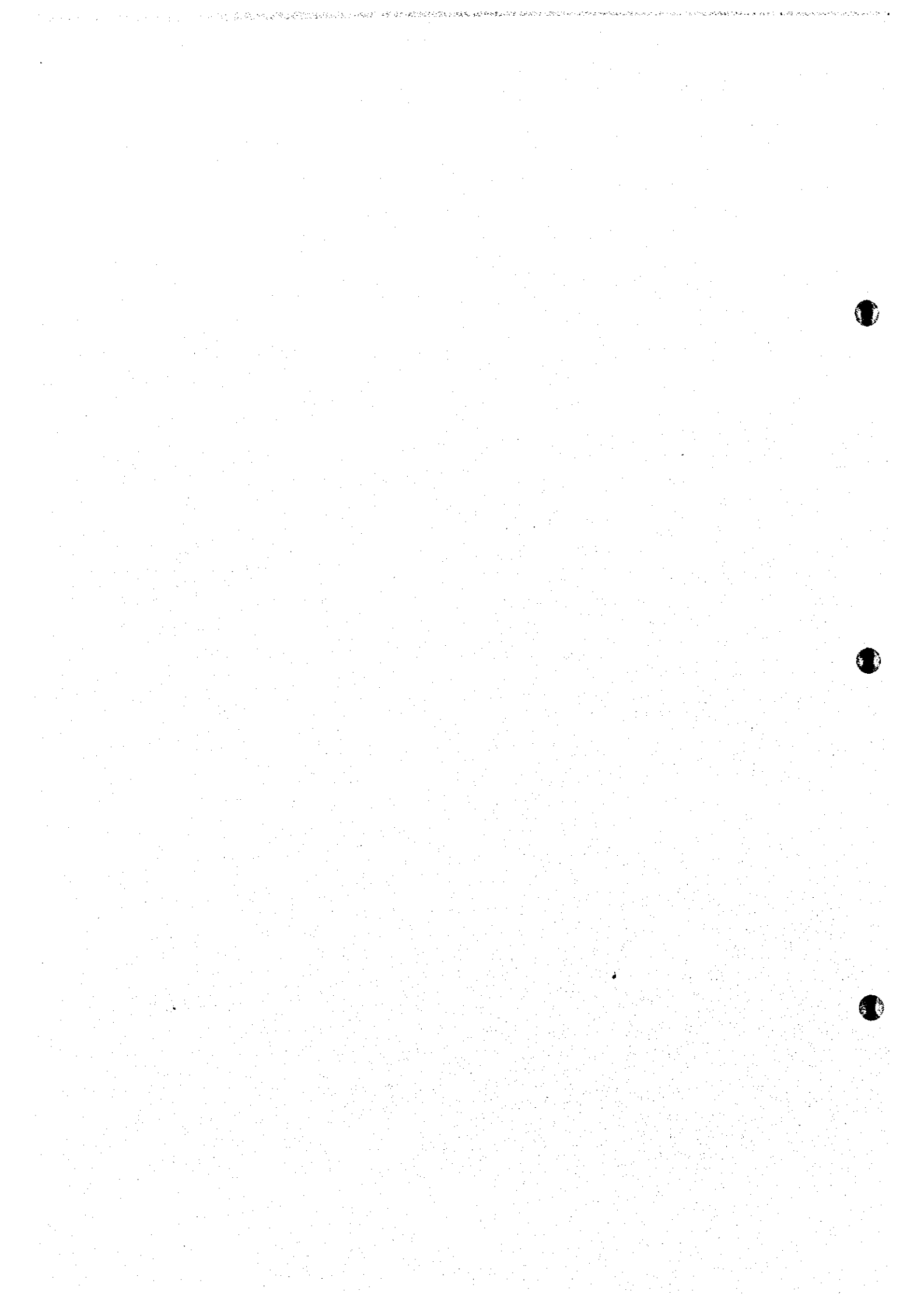
Stages	Main Activities	Inception Phase				Capacity Build, at National and Provincial Level													Capacity Building at Pilot Commune Level													Input in man-months																								
		Project Months				1				2				3					4				5				6				7				8				9				10				11				12				13	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	National & Province Lev.	Pilot Commune	
Stage 1 – Preperation and Capacity Building at National Level:																																																								
1. PMU establishes the NTT and prepare detailed plan of implementation																																																								
2. PMU facilitates the establishment of NPSC with support from NTT.																																																								
3. NTT addresses capacity building needs at national, provincial and local level in detail;																																																								
4. NTT establishes a net of Training Providers (TP);																																																								
5. NTT and TP develops capacity building programmes, and monitoring and evaluation systems																																																								
6. NTT and TP provide capacity building measures NPSC																																																								
Stage 2 – Capacity Building at Provincial Level																																																								
1. PMU establishes PPCCs with support from NPSC																																																								
2. NTT establishes Provincial Training Teams (PTT)																																																								
3. TP apply training of trainers programme for PTT																																																								
4. NTT apply capacity building for PPCC.																																																								
5. TP provide project-related training to PTT																																																								
Stage 3 – Capacity Building at Commune Level																																																								
1. PTT liaison with CPC followed by capacity building activities to enhance CPC's facilitating role.																																																								
2. PTT together with the CPC facilitates the organisation of Village Mobilisers;																																																								
3. PTT train Village Mobilisers																																																								
4. Mobilisation of commune people																																																								
5. PTT support CPC in establishing WATSAN committee;																																																								
6. PTT train WATSAN committee members in their forthcoming duties																																																								
7. PTT supports WATSAN committee in the tendering and construction of water supply system;																																																								
8. PTT supports the WATSAN committee in selecting CWSO staff;																																																								
9. PTT training CWSO staff;																																																								
10. PTT supports CWSO staff in the running-in of water supply system and apply on-the-job training of CWSO staff and WATSAN committee members																																																								
Stage 4 - Monitoring and Evaluation																																																								
1. NTT train NPSC, PTT and PPCC in monitoring and evaluation techniques;																																																								
2. NTT evaluate monitoring and evaluation by PTT (and NPSC and PPCC).																																																								
Project Staffing Schedule related to organisation and capacity building																																																								
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Deputy Team Leader (national human resources development expert)																																																								
National Specialist (training providers)																																																								
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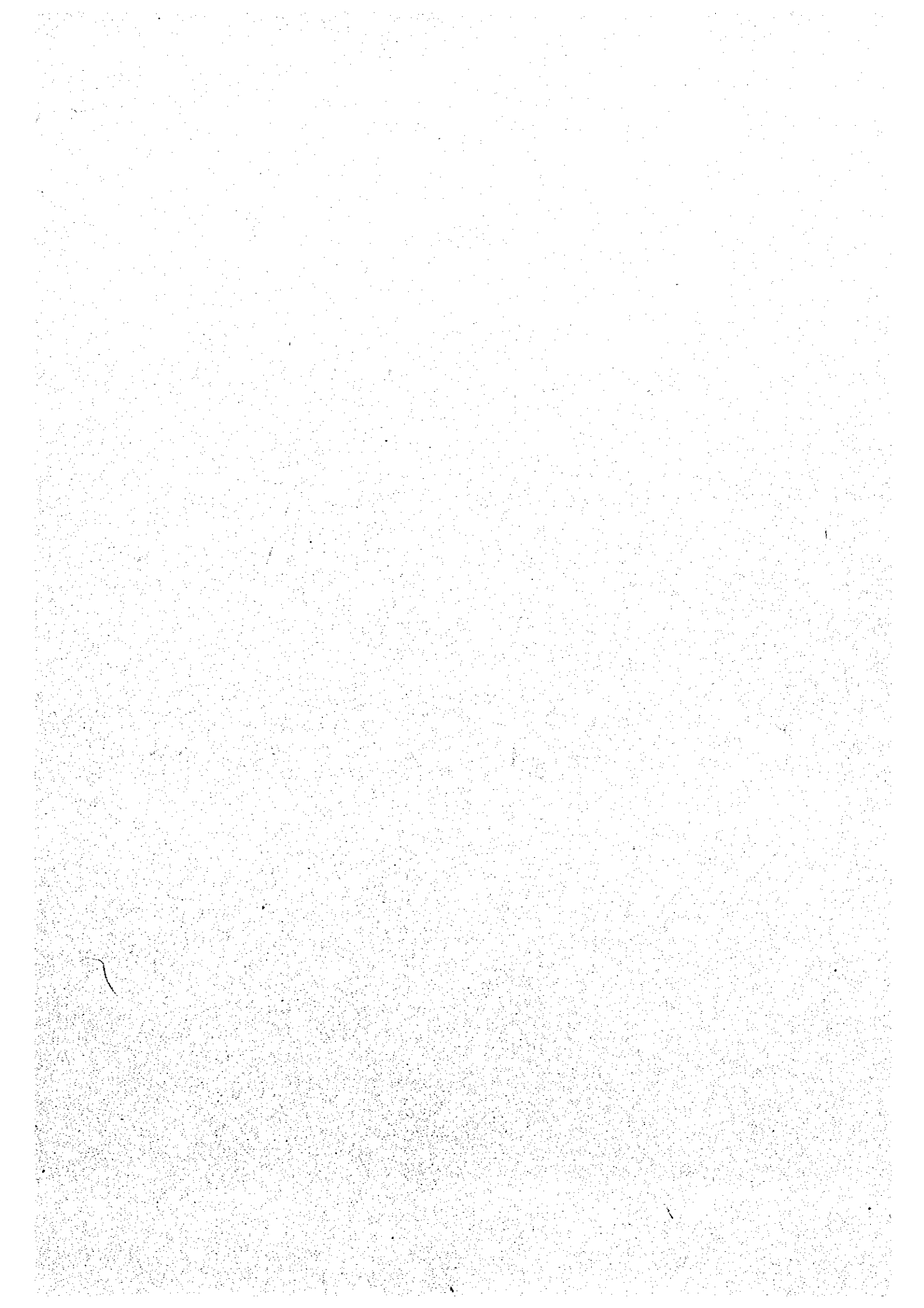
Project Implementation - Organisation and Capacity Building Component

Stages	Main Activities	Year	Project Implementation at Commune-level																																																																												
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Stage 1 – Preperation and Capacity Building at National Level:		<ul style="list-style-type: none"> 1. PMU establishes the NTT and prepare detailed plan of implementation 2. PMU facilitates the establishment of NPSC with support from NTT. 3. NTT addresses capacity building needs at national, provincial and local level in detail; 4. NTT establishes a net of Training Providers (TP); 5. NTT and TP develops capacity building programmes, and monitoring and evaluation systems 6. NTT and TP provide capacity building measures NPSC 																																																																													
Stage 2 – Capacity Building at Provincial Level		<ul style="list-style-type: none"> 1. PMU establishes PPCCs with support from NPSC 2. NTT establishes Provincial Training Teams (PTT) 3. TP apply training of trainers programme for PTT 4. NTT apply capacity building for PPCC. 5. TP provide project-related training to PTT 																																																																													
Stage 3 – Capacity Building at Commune Level		<p><i>Ha Noi province:</i> Dong Ngac Xuan Dinh</p> <p><i>Ninh Binh province:</i> Dong Phong Quang Son Yen Thang</p> <p><i>Thai Nguyen provinc:</i> Hoa Thuong Dong Bam Thinh Duc Nam Tien</p> <p><i>Thanh Hoa province:</i> Vinh Loc Town and Vinh Thanh Dinh Tuong Thie Hung Thieu Do Van Thang</p>																																																																													
Stage 4 - Monitoring and Evaluation		<ul style="list-style-type: none"> 1. NTT train NPSC, PTT and PPCC in monitoring and evaluation techniques; 2. NTT evaluate monitoring and evaluation by PTT (and NPSC and PPCC). 																																																																													
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