5.3.2 Promotion Program

One of the characteristics of rural Lao is that people are living in remote villages under rather isolated circumstances. They are living with their own languages, cultures and lifestyles, which vary significantly from the ordinary or average pattern of the Lao. The uniqueness may sometimes hinder even local health staff to communicate effectively. The staff may find some difficulties in using available health promotion materials, which are mostly designed for average people in this country.

It is generally believed that it requires certain skills and talents to develop educational materials such as posters or visual aids for public health promotions. If we could have specifically designed visual aids for a target village, the health message shall have more reality and stronger impact to the people. This can be realized by modern digital technology, i.e. a portable computer, a digital camera and a projector.

The "On-site material development" is a new concept that needs close cooperation between the local health staffs and the study team. The local health staffs have the detailed and practical information on local epidemiological situation and are capable of communicating to the local villagers effectively. We introduce modern digital equipment to make them able to organize health messages into a form of slide presentations. There are several key concepts to realize it.

Local epidemic episodes: People in a village will definitely be interested and accept a message if they think it is useful. That is the core assumption of this activity. The message should be based on a "here and now" inspiration rather than an old medical textbook. Therefore, we began to search for a recent and nearby epidemic episode from local health staffs who have witnessed, or hopefully participated in that health event. If he/she could remember the outbreak control operation that he/she had attended, he/she has a good potential to tell the episode vividly to the villagers.

Health message organization: Based on the real episode, the course of the event, the control measures taken and the preventive measures which are specifically appropriate to the target village, are to be organized in a slide presentation format in order to persuade the people to avoid similar disease outbreaks again.

Visualization: There are two kinds of image sources. One is already the existing posters, flips and leaflets etc., and the other is the actual village scene. According to the health message developed by the local health staffs, most appropriate images are selected for the presentation. Using letters should be minimized in order to communicate with illiterate villagers.

Rehearsal: Along with the organized slide images, verbal presentation is to be organized. A presenter should be familiar with the local language spoken in the target village. For trained personnel with a "health education", advice should be given as not to be in a textbook style, or not to use any technical terms.

Feedback: The team reviews the Rehearsal and makes necessary amendments in the slide sequence and verbal presentation.

After fixing infrastructure for the on-site material development, the daily routine work can be as follows.

Village walk: Every morning, a couple of hours or more should be spent to investigate real people's life in the target village, with a digital camera in the presenter's hand. Although it will not appear on the screen, odors and sounds in the village will also be inputted in the presenter's mind. By using actual scenes in the village as the materials for the show, the show avoids becoming a one-way communication, which merely tells them what to do like an ordinary textbook. This village walk always gives important messages from the villagers with words as well as without words.

Getting pictures into Portable Computer: The picture files created by the digital camera are transferred into the portable computer. A device such as a "compact flash memory card" can be used for this process. It takes about one to two hours. The rechargeable battery for the digital camera is set in a battery charger in preparation for use the next morning

Editing: Based on feedback from the previous show, new findings or impressions of the village walk, any amendments would be discussed among the presentation team. For example, in order to make the health message clear and understandable, changing the order of the components, adding or deleting pictures, adjusting picture quality such as brightness or contrast, and modifying the manner of presentation should be considered. It takes about one hour, sometimes two hours.

Rehearsal: The presenter will play his role and the rest of the team will listen to his presentation. The slide change timings, appropriateness of the expressions such as use of difficult technical terms, and smooth flow of the messages are the main focus of attention. An inexperienced presenter can get certain confidence in him/herself by doing a rehearsal.

Slide-show: Shortly before sunset, preparations should be started and the show ground set up by hanging the screen, setting the generator and extending the wire. The actual show can begin around 7 o'clock in the evening. This is the time for most villagers to have dinner. However, if they have been well informed and the show is attractive enough, the villagers can arrange their time and come to gather at the show ground. The show will end at 8 or half past 8.

Feed back: If there is time to talk with the villagers after or during the show, those are the valuable chances to get direct feed back from the real audience. The comments from the villagers should be considered for the next slide show.

The actual slide show can consist of the following eight components as an example.

(1) Pre-attraction

After setting up the show ground, while waiting for the adult villagers to come, a pre-attraction show can be presented particularly for the children who will be watching the preparation activities with their utmost curiosity from the very beginning. Show them series of simple clips, animations and the village pictures. Although it needs no guidance or explanation with it, it should be designed to imply health and water issues to the audience. When they start enjoying and laughing, other people from nearby houses will run to see the show with their dinner in their hands.

(2) Introduction

This component responds to the villagers' two major questions: who the presenters are, and why they are here on that night. This introduces the objectives of the show and should give a brief orientation of the project.

(3) Epidemic Episodes

The locally experienced real epidemic episodes organized by the local health staffs are presented to the audience.

(4) UNICEF #6

Within the school health programme run by Nam Saat-UNICEF, a series of short stories has been provided. This "Story #6" is the funniest one among all. A schoolboy was seeking around for a comfortable place for evacuation and finally settled in the school latrine.

(5) UNICEF #8

This is another short story from the Nam Saat-UNICEF school health programme, with a theme on clean river.

(6) Pictures of Village Life

This component can show some 30~50 pictures taken in the village in the morning during the village walk by the presenter himself. It can have two conceptual themes: people's life and water. The presenter should add some comments on the pictures occasionally. At the first time, people will seem to be surprised with their own familiar figures on the screen. Then they will start enjoying and become excited with the show. Through this stage, you can expect that the audience may be reminded that all the pictures or messages that have appeared on the screen are as real as their every days life.

(7) UNICEF #7

This is yet another short story from the Nam Saat-UNICEF school health programme. A village woman negotiates with a spirit "Meikala" for super medicine to cure diarrheas. The relationship between villagers and Meikala can be interpreted as the relationship between villagers and outside supporters such as Nam Saat or donors. The underling message is "the movement you need is on your shoulders".

(8) Project Information

At the end of the show, project information such as materials delivery schedule or communal labour can be given to the audience by showing related pictures. It will encourage all the villagers to participate.

The tools and equipment to be used in the health promotion activities are exemplified in the following box.

Portable PC[1]	Generator	Screen	Laser pointer
Digital camera	Stabilizer	Pins & Clips	Lamp
LCD[2] Projector	Fuel tank	Rope	Amplifier and microphone

[1] Personal Computer
[2] Liquid Crystal Display

5.4 Operation and Maintenance

5.4.1 WATSAN Committee

For sustained use of the facilities, the village must form a WATSAN (water and sanitation) committee to control the activities related to water supply and sanitation. The members should include a village caretaker or volunteer to handle small repairs and technical matters, and an accountant to manage fees and bookkeeping, among others. Furthermore, since women are the ones who do most of the water fetching, the committee should have equal gender balance to maintain fairness in opinions as well as responsibilities. The main functions and responsibilities of the committee are listed below.

(1) Clean and maintain the water supply and sanitation systems
(2) Supervise and advise on use and maintenance of taps, handpumps and latrines
(3) Collect water fees and keep accounting
(4) Organize meetings and discussions to resolve problems related to water use
(5) Distribute work responsibilities among men and women
(6) Make small repairs
(7) Monitor and promote sanitation and hygiene
(8) Control waste into water sources
(9) Prevent contamination of the environment

The monitoring results for the pilot villages showed that WATSAN committees are functioning at about 76% of the villages. The villagers have shown high consciousness towards the importance of the committees, but only about half of the villages are collecting maintenance fees to sustain their systems. Nonetheless, many villagers, especially in the poorer villages, are expressing their willingness to maintain their facilities, but lack the knowledge and experience. The measures necessary to be taken to improve the functioning of the committees are listed below. Although most of these are conducted during the preparation for construction, they need to be repeated since constraints in project scheduling usually do not allow them enough time to satisfactorily absorb the concept. Also, the villagers need to learn-by-doing, so repeated actions can serve to recall and refresh their mind and memory.

(1) Explain function of the committee and confirm their understanding
(2) Train village caretakers on maintenance
(3) Train members on maintenance fee collection, as well as bookkeeping and accounting

(4) Explain importance of gender balance.

(5) Provide basic hand tools for simple repairs

5.4.2 Village Requirements and Responsibilities

The proper operation and maintenance of facilities assures long life of the components and reduces the requirements for repairs. Operation and maintenance requires great efforts by the community since the activities must be on a regular basis with cooperative support from all concerned. Regular inspections are needed as a means for preventive maintenance, and minor repairs and replacements have to be made as soon as possible to sustain reliability of the facilities. Village committees must have an appropriate fee collection method and properly keep an accounting system to pay for the required efforts. The main activities required for proper operation and maintenance of each of the water supply and sanitation facilities, as tabulated below, need to be understood by the villagers.

Operation and Maintenance Activity Chart for Water Supply and Sanitation Facilities

1. GFS (Gravity Fed System)

Activity	Frequency	Person Responsible	Requirements	
			Materials	Equipment
Intake Cleaning and Maintenance	Every month	Village volunteer (Care taker)		Hoe, shovel, scraper, etc.
Pipe Inspection	Every 2 weeks	Village volunteer (Care taker)		
Water Quantity Measurement	Seasonally	Village volunteer (Care taker)		Bucket, watch, etc.
Water Quality Analysis	Seasonally	-District Nam Saat -Provincial Nam Saat	Analysis kit and chemicals	Sampling bottle
Filter Tank Cleaning	Every month	-Village volunteer -Water users		Bucket, brush, etc.
Water Storage Tank Cleaning	Every month or whenever necessary	-Village volunteer -Water users		Bucket, brush, etc.
Tap and Drainage Cleaning	Every 2 months	Water users		Hoe, shovel, brush, etc.
Small Repair	Whenever necessary	Village volunteer	Spare parts (joints, taps, pipe, etc.)	Repair kits, saw, shovel, knife, etc.
Big Scale Repair	Whenever necessary	-Village volunteer -Technician from District Nam Saat	Spare parts	Repair kits, saw, shovel, knife, etc.
Repair of Fence around Tap	Whenever necessary	Water users	Wood, nails, fence material, etc.	Saw, hoe, shovel, knife, hammer, etc.
Repair of Fence around Intake	Whenever necessary	-Village volunteer -Water users	Wood, nails, fence material, etc.	Saw, hoe, shovel, knife, hammer, etc.

2. Borehole

Activity	Frequency	Person Responsible	Requirements	
			Materials	Equipment
Pump Cleaning and Maintenance	Every week	-Village volunteer -Water users		Bucket, brush, etc.
Drainage Cleaning	Every month	Water users		Shovel, hoe, scraper, etc.
Water Quality Analysis	Seasonally	-District Nam Saat -Provincial Nam Saat	Analysis kit and chemicals	Sampling bottle
Repair of Fence	Whenever necessary	-Village volunteer -Water users	Wood, nails, fence material, etc.	Saw, hoe, shovel, knife, hammer, etc.
Repair of Foundation and Drainage	Whenever necessary	Water users	Cement, sand, gravel, wood, nails, etc.	Tape measure, bucket, shovel, spade, saw, knife, etc.
Borehole Repair and Maintenance	Whenever necessary	-Village volunteer -Technician from District Nam Saat	Spare parts	Repair kits & repair tools

3. Dug Well

Activity	Frequency	Person Responsible	Requirements	
			Materials	Equipment
Pump Cleaning and Maintenance	Every week	-Village volunteer -Water users		Bucket, brush, etc.
Drainage Cleaning	Every week	-Water users		Shovel, hoe, scraper, etc.
Well Cleaning	Twice a year	-Water users		Pump, hoe, shovel, bucket, brush, etc.
Water Quality Analysis	Every 3 months	-District Nam Saat -Provincial Nam Saat	Analysis kit and chemicals	Sampling bottle
Water Treatment	Twice a year	District technician	Chlorine	Bucket
Repair of Fence	Whenever necessary	-Village volunteer -Water users	Wood, nails, fence material, etc.	Saw, hoe, shovel, knife, hammer, etc.
Repair of Foundation and Drainage	Whenever necessary	Water users	Cement, sand, gravel, wood, nails, etc.	Tape measure, bucket, shovel, spade, saw, knife, etc.

4. Latrine

Activity	Frequency	Person Responsible	Requirements	
			Materials	Equipment
Latrine Bowl Cleaning	Daily	Family/Households	Washing powder	Bucket, brush, mop, etc.
Repair of Squat Plate	Whenever necessary	Family/Households	Wood, nails, cement, sand, gravel, etc.	Tape measure, bucket, shovel, spade, saw, knife, etc.
Repair of Superstructure	Whenever necessary	Family/Households	Wood, nails, bamboo, roof material, etc.	Tape measure, bucket, shovel, spade, saw, knife, etc.
Cleaning of Septic Tank	Whenever necessary	Family/Households		Shovel, scraper, hoe, pump, etc.

Each person involved in the operation and maintenance of the facilities has his own responsibility. However, they must have minimum skills and knowledge related to their responsibilities in order to properly fulfil their responsibilities. Since high level knowledge and skills are not required by the villagers, they should be warned not to neglect periodic maintenance activities, unless they do not want to prolong their conveniences.

1. **Water Supply Facilities**

Person Responsible	Responsibilities	Required Skills and Knowledge
Water User (Family/Household)	• Assist village volunteer in maintenance of water scheme • Clean facilities (tap, intake, water storage tank, filter tank, pipe, pump, drainage, etc.)	• No specific skills required
Village Volunteer (Care Taker)	• Maintenance, small repairs, monitoring of water supply schemes	• Basic technical skill and knowledge on repair and maintenance of water schemes • Basic knowledge on sanitation
Village Committee (Water Committee, Sanitation Committee)	• Management and monitoring of water supply activities • Hygiene promotion	• Basic knowledge on management and sanitation
District and Provincial Nam Saat	• Water quality analysis • Water quantity measurements • Big scale repairs • Monitoring of water supply activities • Supervise construction work	• Technical skills and knowledge in repairs, water quality analysis, flow rate measurements • Knowledge on management and sanitation promotion

2. **Sanitation Facilities**

Person Responsible	Responsibilities	Required Skills and Knowledge
Latrine User (Family/Household)	• Assist village volunteer in maintenance of latrine • Clean latrine	• No specific skills required
Village Volunteer (Care Taker)	• Repair of latrine • Supervision on construction of latrines	• Basic technical skill and knowledge on repair and construction of latrines • Basic knowledge on sanitation
Sanitation Committee	• Hygiene promotion	• Basic knowledge on management and sanitation
District and Provincial Nam Saat	• Monitoring on use of latrines and behavior towards sanitation • Supervise construction work	• Technical skills and knowledge in construction of latrines • Knowledge on sanitation and hygiene promotion

5.4.3 Cost Recovery

The recurrent costs for operation and maintenance of the facilities include salary for village caretaker, cost for repairs, expenses for informing of major damages, etc. If these funds are not adequately collected in a continuous manner, then the system will not function properly, become poorly maintained, and not be sustainable. The operation and maintenance costs can be recovered only if the users are able as well as willing to pay for the services. Some significant factors which can influence the willingness of users to pay are given below.

- Income: If villagers cannot actually pay, they will definitely be unwilling to pay.
- Service level: Users will be willing to pay only for the level of service they really desire.
- Standard of service: Users are unlikely to pay for poor service.
- Perceived benefits: Users may place priority on immediate social and economic benefits rather than health benefits which are important for project objectives. Perceived benefits can vary where some may be attracted to commercial opportunities of increased supply of water, whereas others can be interested in greater conveniences of getting water at an immediate location. The differences in benefits can result in a variable willingness to pay within a village.
- Opportunity cost of time: Since in most cases, it will be women's time that will be saved by the improved convenience, they may be more willing to pay than men.
- Acceptability of existing facilities: If villagers think their existing water supply is acceptable, then they may not be willing to pay for the new supply.
- Confidence in village committees: Past disappointments have often undermined the villagers' confidence in village committees, and so an open and transparent management system which consults users in making decisions will help instill trust and encourage payment.
- Community cohesion: Individuals in an ethnically mixed village may be unwilling to pay into a common fund.
- Policy environment: Previous policies have encouraged the belief that water should be free, and the villagers may be unwilling to pay for something which they feel should remain free.
- Sense of ownership and responsibility: Villagers may be unwilling to pay for maintenance of something they feel is not their own.

The monitoring survey on the pilot study villages revealed that some villagers were reluctant to pay the fees set by the WATSAN committee of the village. Their reasons varied according to the situation of the village, but the main reasons are listed in the following table.

Situation	Consequence	Solution
Their houses are farther away from the tapstand than others	Unfairness in use frequency and resultant inequality in quantity used	Collect fees on a volumetric basis instead of fixed fees, according to amount used
During some hours, they cannot get water when other tapstands are being used at the same time	Ignorant villagers keep tap open all day. Creates dispute over who will use the tapstand first.	Need strong leadership to educate villagers on conservation. Set up a use time table.
For borehole villages, water has undesirable odor	Do not want to use for drinking. Not willing to pay water fees.	Seek an oxidation treatment method, such as long-period storage. Need explanation on importance of collecting water fees. If necessary, construct a new dug well with handpump, or install a handpump on existing dug well.

Water fees are important source of fund to balance the operation and maintenance costs. Various methods of collection are available, but the two common methods which are recommendable are listed below.

- Fixed rate — Users pay a fixed flat fee per person or per household on a periodic basis, such as per month, for a tapstand or well
- Volumetric rate — Users pay for the amount they use according to the reading on the water meter. In the case of villages with wells, this cannot be applied as there is no meter, but fees can be charged according to the used number of a standard container, such as a bucket.

Whenever a village starts collecting water fees, most often they will set the cost on a fixed fee basis such as a certain amount per household per month. This method is acceptable if all beneficiaries are receiving equal benefits. However, as soon as some users come to realize that they are not getting equal benefits, then they will start complaining or not pay the fees. To alleviate this situation, the volumetric approach is a solution. Nonetheless, this also has its drawbacks. The person in charge of collecting fees has to be well trained in reading the meter and calculating the correct amount used. If the fees are to be collected on a monthly basis, the readings have to be carefully recorded where accounting and bookkeeping has to be properly managed.

From the results of the Pilot Study, the amount which the villages are willing to pay for operation and maintenance is about 100 kip per person per month on the average, which implies about 550 kip per family or household per month[3]. The average monthly income of the Pilot Study villages is about 195,000 kip/family. This implies that the villages are willing to pay only about 0.3% of their income for recurrent costs. This amount is quite low, but the present collected fee of 100 kip/person/month is reasonable to balance the required expenses for routine maintenance. However, to cover emergency situations and in consideration of replacement requirements, raising the fee is advised. An amount up to about 6,000 kip/family/month or 1,100 kip/person/month which is about 3% of the average income could be possible in relation to their income. This amount should be able to cover the realistic annual costs required for operation and maintenance on a long-term basis to create a sustainable system. However, as mentioned above, collecting a fixed fee cannot continue whenever the villagers start to realize its unfairness to all users, and a volumetric fee would become a more realistic approach if it can be properly managed.

[3] The average number of persons per household is about 5.5 from the survey

5.5 Organizational Reform

5.5.1 Present System

The counterpart organization for the present study is Nam Saat, or National Center for Environmental Health and Water Supply (NEW), under the Ministry of Public Health. Nam Saat has emerged from a program office in 1981 to an administrative department in 1999 with higher responsibilities. The main functions of this organization are as follows.

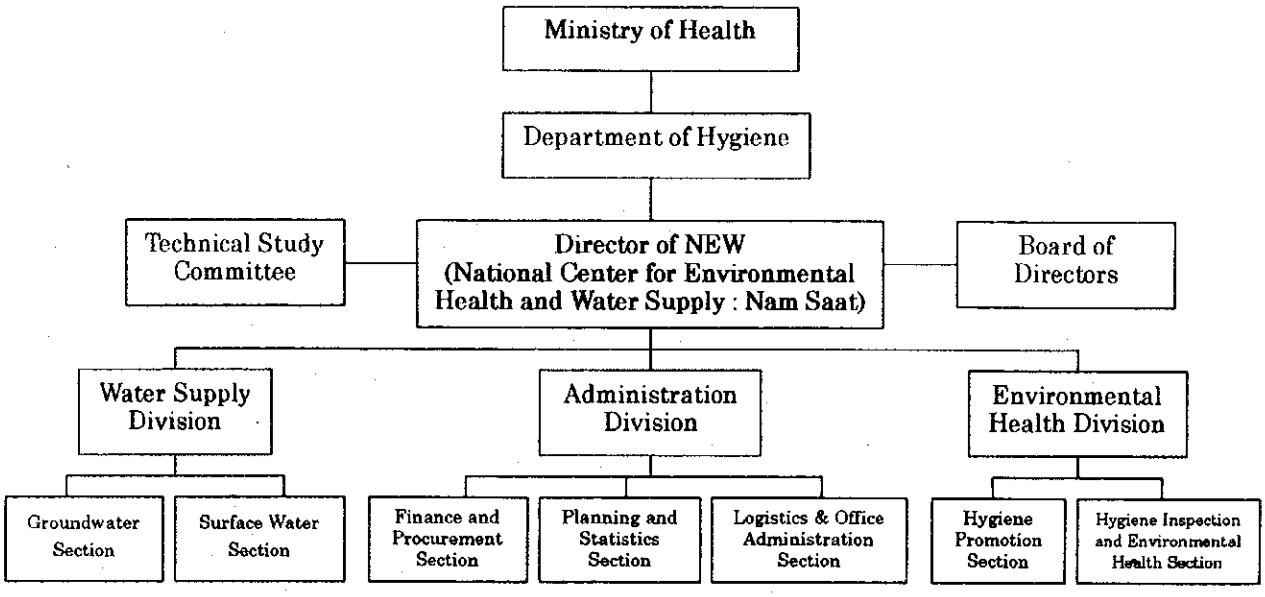
- Support to community based activities related to improvement and expansion of rural water supply and sanitation services
- Promotion of community awareness to gain favorable benefits through proper and sustainable use of the water supply and sanitation services

Nam Saat is the central organization responsible for rural water supply and sanitation activities for the whole country having responsibilities as listed below.

- Formation of action plans for the rural water supply and sanitation sector based on Provincial and regional development plans around the country
- Technical assistance in supervision, support, advice and management of rural water supply and sanitation activities
- Coordination and allocation of funds from the state, private sector and external supporting agencies
- Procurement of materials and equipment
- Control and monitoring of rural water supply and sanitation activities
- Reporting to related sectors and agencies
- Conducting scientific surveys and research
- Establishment of standards and norms

The present organization chart of Nam Saat central is depicted in the next page. The numbers of staff of Nam Saat central for each division are as follows:

Board of Directors	3 persons (all male)
Water Supply Division	9 persons (all male)
Environmental Health Division	10 persons (4 females)
Administration Division	11 persons (5 females)
T o t a l	33 persons (9 females)



At the central level, Nam Saat now has thirty-three staff working in three divisions, that is, Water Supply Division, Environmental Health Division and Administration Divisions. Over 70% of the staff members are qualified as either medical doctors or civil engineers. Nine women are staff members, and three out of them graduated from tertiary institutions. This gender imbalance may lead to slow changes in gender awareness and attitude toward WID. The number of technical staff outweighs the managerial staff, as many of them have to take duel responsibilities. Over ten staff members have been involved in this Study at different stages and have acquired technical and managerial knowledge replicable to other similar projects. Especially, the assigned coordinator from this staff, who has participated in every stages of the Study, has performed his assignment with gradually improved skills and efficiency.

Achievements made by Nam Saat central during this Study in the course of their systematic learning process are listed below. They have taken initiative and direct responsibility on their trail to being self-reliant for future similar activities.

(1) Planning and presentation of workshops
(2) Planning and implementation of the Pilot Study
(3) Scheduling and facilitation of the TOT, including on-the-job training
(4) Training on and supervision of water supply and sanitation facilities design
(5) Coordination of community dialogue
(6) Facilitation and supervision of sanitation education and hygiene promotion
(7) Supervision of and advising on construction works
(8) Scheduling and coordination of monitoring

The Provincial Nam Saat Office is a unit with limited number of staff as compared to the demand of the population in each of the target provinces. The Provincial Nam Saat is one of the sections directly under the Provincial Public Health Department along with other sections such as Drug and Medicine, Primary Health Care, Malaria, Epidemic, and Mother and Child Health. The number of staff varies from province to province. Luang Namtha has ten staff (two women) while Bokeo has seven staff (two women). Half of the staff have acquired intermediate level education or graduated from medical college. The technical, administrative and management skills of provincial personnel need to be trained to develop them for the field requirements.

The number of District Nam Saat staff usually varies between two to four for each district. None of the district offices have female staff working in neither administration/management nor in technical units. The organizational structure of Nam Saat at district level was simply set up with each staff responsible for each task assigned by the chief, and usually undertake the duel responsibilities for the management of water supply or sanitation development projects. Only 35% of the staff members graduated from intermediate level medical colleges. Lack of both technical and managerial skills and knowledge in addition to limited budget and resources, especially transportation means, are considered to be the major constraints and problems faced by Nam Saat offices in each district. In all the district offices, there was no clear budget allocation policy where the staff would be able to work in the field only when they received a designated fund. The staff has unclear job descriptions and everyone seemed to compete over donor-funded projects which sometimes overlapped. Furthermore, the Sector Strategy was not clearly understood and supported by the staff at the district level.

5.5.2 Institutional Reinforcement

An institutional management assessment of Nam Saat at each administrative level was conducted by using the ID/OS organizational assessment method during the monitoring survey in June 2000. The results are summarized below.

1) Sector Strategy and its Support by the Staff at Each Level

The Sector Strategy is used as a policy as well as a mission of the organization to promote quality-oriented water supply schemes and sanitation facilities to meet the local demands, especially for remote zones where the water and sanitation conditions are the poorest. However, the extent of understanding the Sector Strategy by the staff varies between each administrative level. Dissemination and understanding of the Sector Strategy at district level is not as high as the

central and provincial levels. For some of the district staff, it is necessary to develop a revised guideline that is easier to read and understand which describes the strategy in a more practical way to match the local situation.

2) Improvement of Supply-Oriented Weaknesses to Promote Local Demand-Oriented Project Management

The results of the institutional management assessment of Nam Saat show that staff involvement in decision making varies for each level. That is, the amount of information being disclosed to the staff concerning the contents of the decision and plan is higher at central level and lower at district level, with consequent level of involvement. This predicament is coincident with the stance that water supply schemes are not sufficiently meeting the local demands.

In this sense, the central staff having professional technical knowledge play key roles in realizing a demand-based planning in collaboration with provincial and district staff. Planning can be guided by proper directions with professional judgment through a mixture of various expertise.

The network and infrastructure for communication has to be improved between field offices and central office to grasp the local situation, understand the demands and send feedback. Efforts have to be made to modify a plan flexibly, timely and relevantly, in accordance with the actual situation. Furthermore, technical training for the field staff, continuous follow-up of the program and periodic monitoring by each level office are also required.

Past experiences and lessons learned have to be utilized by Nam Saat both internally and externally, and should be disseminated among external organizations and agencies according to the learning-based approach. This can contribute to duplicating the successful experiences and avoid repeating the same mistakes to achieve more efficient and effective programs.

5.5.3 Proposed Arrangements

Nam Saat central should be allotted the responsibility of steering the direction of comprehensive strategy items and developing a long-term activity framework for the sector. The proposed recommendations are listed below.

(1) Build capacity and develop the institution of Nam Saat: Develop the right attitude to training. Training and development are twin processes in which training provides knowledge, skills and attitude, and development produces

action through on-the-job application of capabilities. On the other hand, the staff of Nam Saat should take responsibility, commit to service, become partners in change, participate in interactive learning, model the change and provide feedback for learning. Furthermore, train Nam Saat in general management, financial management and administrative skills, and also develop a financial and procurement system in order for Nam Saat to become self-reliant and able take direct responsibilities. SIDA's Phase II Transitional Support along with the inputs of the CTA with back-up support from WB WSP-EAP and UNICEF are greatly contributing to build the capacity of Nam Saat to become independent of external assistance in management and implementation.

(2) Formulate plans based on grassroots level recommendations and needs through the support of District and Provincial Nam Saat offices: The government's new policy for planning and implementation of "central is the focal point for policy, Province for strategy, District for planning and the village for implementation" should be adopted. Also, decentralization of funds to Provinces is needed.

(3) Strengthen the links and collaborations with other agencies and supporters: Establish a collaborative working relationship and maintain an active partnership and good liaison with external supporting agencies and NGOs, and other government agencies.

(4) Stand firm on the concepts of the sector strategy and guideline national framework, and make efforts to expand and improve upon these concepts: In this respect, the Sector Strategy should be refined and mastered at all levels, especially by the District.

(5) Promote gender-balanced involvement in all activities at all levels: For the purpose of achieving this balanced involvement, the situation report on gender policy should be consulted in order to involve women more positively and actively in the same manner as men.

(6) Strengthen function and roles of Nam Saat: Frequent changes in staffing has negative effects to the strengthening of Nam Saat. More trust should be handed over from the Department and Ministry to give Nam Saat more autonomy, delegate authority and responsibilities to become a more efficient system. Strengthening and restructuring of the institution and capacity building of Nam Saat staff could pave the way for Nam saat to become a department under the Ministry of Health.

CHAPTER 6 PROJECT EVALUATION

6.1 Economic Benefits

The Project is designed to satisfy the basic human needs (BHN) of the villagers, who are mostly ethnic minorities, living in the remote areas in the North-West region of the Lao PDR, namely in Luang Namtha and Bokeo Provinces. A total of 81 villages in this area have been selected as the target villages for this Study. Out of these 81 villages, 34 villages as pilot study and 17 villages as pilot study extension for a total of 51 villages were already implemented water supply and sanitation facilities. The remaining 30 villages are the targets for Project implementation.

Similar to the Pilot Study villages, the Project is expected to yield a variety of direct and indirect benefits, which can be received on a short term as well as a long term basis. The direct benefits include, among others, increased number of beneficiaries, health improvement, time savings, guiding orientation/capacity building, consumer satisfaction, and improved quality of life. On the other hand, the expected indirect benefits are, increase in economic development owing to more time and greater opportunities for cash generation; reduction in morbidity and mortality of children as a result of improvements in sanitation and increased time for women to care the children; increased activities of the rural population for community development as a result of the reduced time, and others.

Increased Beneficiaries:

- The total beneficiaries in the target year 2015 are projected to be 14,426 persons

Expansion of Coverage

- At the District level, the coverage rate for water supply will increase from an average of 25% before the project to 44% after the project. Similarly, the sanitation coverage at the District level will improve from an average of 16% before the project to 29% after the project.
- The increase in coverage rates for target Districts have higher significance than the Provincial rates implying that the Study is targeting the less developed areas in the region.

Improvements in Conditions of Sanitation and Hygiene

- About 70% of the pilot village population reported a noticeable decrease in the number of water related diseases such as diarrhea after access to clean water and sanitation. Similar improvements are conceivable for the project.
- The days of absence from school of the pilot village children have decreased after receiving the conveniences.

Effects on Time Saved in Water Collection

- About 91% of the pilot villages responded to reduction in water fetching time by using the improved water supply facilities, with an average time reduction of more than 20 minutes. Therefore, similar effects can be expected from the project.
- The reduced fetching time is used, especially by women, for caring their children, tending gardens and raising livestock with possibilities for increased income from these extraneous activities.

Contribution to Guiding Orientation and Capacity Building

- The Project can contribute to guiding orientation of counterpart staff towards participatory methods and learning-through-sharing to apply demand-driven approaches.
- Capacity building of all level concerns can be effected through training sessions, OJT and actual applications in line with learning-by-doing.

6.2 Social Evaluation

Social Impact and Social Considerations

Evaluation on social impacts brought by the project and other social considerations are summarized below.

(1) Needs Satisfaction

- GFS schemes of one source to supply one village brought higher satisfaction to the villagers.
- Boreholes did not bring needs satisfaction to the villagers because water has undesirable odor.
- The GFS scheme supplying 9 villages in Houayxai as one scheme did not bring high satisfaction to the villagers as somewhat predicted due to the already sufficient number of existing dug wells, giving rise to low willingness to participate and contribute.

(2) Ownership and Potential for Sustainability

- Even though participation in community dialogue and contribution to construction were equally shared, actual benefits were not necessarily equal among villagers, such as differences in distance to tapstands and water flow.
- Overall ownership through participation is excellent in GFS schemes, which induces responsibility of the facilities, which is especially true for villages of single-village GFS schemes.
- The level of ownership of the borehole scheme is not considered as satisfactory, because outside contractors have done most of the construction work.

- If the project did not bring any improvement to villagers, ownership had not developed.
- Most of the village committees reported that they were not trained enough on basic repair and management of their water schemes.

(3) Empowerment

- Through the three phases of the study, women tried to be encouraged to participate. Men were enthusiastic to participating in decision-making, whereas female contributed to labor more than men.
- Female participation must be promoted through the whole process including maintenance activities.
- Villages having self-help efforts, high self-sufficiency and urgent demand for water are more cooperative and participatory.

(4) Relationship with Government and Donor

- Only the villages that are benefiting from the project are happy and grateful to the government and donor.
- A more needs oriented project formulation has to be promoted by donors and government.

Community Participation

- Overall participation is excellent in GFS schemes and in most of the villages, labor and local construction materials have been sufficiently provided to the project.
- The level of participation of the villagers receiving boreholes and dug wells were not considered as satisfactory, because most of the construction work has been done by outside contractors who did not clearly understand the importance of community participation in this study. Therefore, sufficient explanation and education are required for both the contractors and villagers.
- The existence of co-ownership between nine villages in Houayxai being supplied by one scheme is causing friction between villages with consequent insufficient development in sense of ownership. The important lesson to be learned from this is that demand orientated project formulation is a key to nurture preferable ownership and substantial sustainability.

WID/Gender Project Cycling

- Whereas most of the users of the water supply schemes are women, the water supply scheme tend to be implemented without women's involvement to create difficulty on reflecting the actual needs on the overall project
- The major purposes of female participation are not only the sustainability of the project and maximization of the benefits to the beneficiaries, but the enhancement of awareness on gender in daily life through the participation of the project

- Gender/WID evaluation on their participation and contribution was quite high from a project cycle management perspective.

6.3 Technical Evaluation

System Function for GFS Schemes

- Malfunctions of GFS are explained below

Problem	Cause	Outcome	Solution
Pipe clogged	Silt, sand and leaves enter the pipe	Stop the flow of water	Dredge out dam behind intake and clean out intake.
Pipe uncovered	Shallow trenching or ground washed away by rain	Accidents such as pipe breakage or disconnection.	Periodic inspection of pipeline route and immediate correction upon discovery
Tap broken	Mishandling of tap, especially the handle. (Many reported children playing by hanging onto tap handle)	Leakage or running water	Education to villagers, especially children, on proper usage of facilities.
Poor drainage	Improper permeation into earth or poorly constructed drainage channel and/or soakaway.	Flooding of tapstand floor and can become a source for water-borne diseases.	Advice on proper drainage functioning and education on sanitation

System Function for Dug Well and Borehole

- For villages using groundwater with dug well or borehole, the problems with system functioning were limited to hand pump operation and drainage.
- Since the drainage situation is similar to that for GFS, the same can be mentioned as was listed above for GFS.
- Even though different types of hand pumps involved different operation techniques, the villagers are not having big problems with their use. Only specific women were having difficulties due to the height of the handle of Tara type pumps.
- The Rope Pump Lao-99 was favored the most for reasons of comfortable turning of the handle and damages are easily repaired using locally available materials.

System Function for Latrines

- The functioning of pour flush type latrines is very simple involving no mechanical parts, and the villagers were not yet faced with any problems
- The only conceivable problems to be encountered are cracks or breakage of the bowl and fully filled underground pits. After about 5 years, when the underground pit becomes completely filled, this pit has to be desludged or cleaned out so that it can be used continuously.

Water Quality

- The groundwater in the boreholes of pilot villages contains an undesirable odor to cause the villagers to avoid using the water for drinking. This is believed to be caused by biological phenomena of organic substances in the geology of this area
- The problem related to water quality of GFS is turbidity, especially during the rainy season.
- Another water quality problem worth mentioning is the number of coliform bacteria. This does not imply absolute fear, but probable indications of fecal contamination. The most positive solution is to boil the water before drinking and many of the rural villagers are already accustomed to this practice.
- The countermeasures for the above water quality problems are listed below.

Indicator	Situation	Countermeasure
Odor	Groundwater from boreholes has undesirable odor resulting in villagers to avoid use for drinking.	Possible solutions to remove the odor would be oxidation by storing the water for a long period before using it or by intensive agitation of the water.
		If the villagers are still reluctant to use the borehole, an alternative would be to construct a dug well with handpump, or if a hand-dug well exists, the well can be modified and installed with a handpump.
Turbidity	The source for GFS is especially turbid in the rainy season.	This situation can be relieved by dredging out the dam behind the intake, and the height of the intake may need to be raised to prevent intrusion of water from above.
Coliform Count	Coliform bacteria are found in some water samples.	If the water is to be used for drinking, it should be boiled.

Water Flow

- Since the source for GFS is a stream on top of the mountain, the flow can diminish during the dry season.
- For villages using groundwater sources from dug wells or boreholes, the groundwater potential of the aquifer will influence the pumping rate.
- Another important consideration for preserving the water sources is conservation of the environment around the water source. Slash-and-burn of forests around streams can have adverse effects on their flow rate.
- Probable causes and their countermeasures to low flow rates are listed below.

Water Scheme	Problem	Possible Cause	Solution
GFS	Flow stopped	Pipe clogged	Dredge out intake area.
		Pipe disconnected	Inspect pipeline and repair
	Insufficient flow	Pipe clogged	Dredge out intake area.
		Low flow rate	Schedule supply hours
		Design fault	Confirm design and modify
		Environment disrupted	Confirm forest around intake for slash-and-burn.
Dug Well	Not enough water when pumping	Water level lowering	Dig well to deeper level

Maintenance

- One of the easiest and most important task for GFS villages is regular cleaning of the system, but these operations are not always being conducted at all villages.
- Collecting maintenance fees on a periodic basis is very effect to sustain the system and foster a stronger sense of ownership. Many of the pilot villages have set a rate of about 100 kip/person/month on the average as the maintenance fee, but only about half of the villages are actually collecting these fees.
- Some villagers complained that they do not want to pay the fee because their house is farther away from the tapstand than others, which creates unfairness in the quantity of water use. This situation can be alleviated by collecting fees on a volumetric basis instead of a fixed price. For proper volumetric levying of fees, the flow meters installed in each of the tapstands should be used for this purpose.
- Other problems communicated by the villagers related to maintenance as well as solutions to them are listed below

Problem	Situation	Solution
Lack of basic tools	The villagers cannot make appropriate repairs because they do not have any basic hand tools.	Province and District should hand out some of the tools used during the construction to the villages.
Delays in response upon informing of damages	Upon informing the District and Province, repairs are not conducted immediately.	Province and District should make periodic interventions to handle these emergencies. And District and Province need means of transportation for this purpose.
Low knowledge of caretakers	Village caretakers cannot properly handle maintenance tasks and repairs because they were not trained.	A training program should be prepared and District and Province should make frequent interventions to advice on water use and sanitation, and support on operation and maintenance.
Maintenance fees not collected	Village misunderstands that the contribution in cash that they made for the construction is to be used for maintenance. Also, some villagers are unwilling to pay because of irregular supply or they are situated far away from tapstand.	The villagers should be trained on operation and maintenance, and given an education to foster a sense of ownership.
Unfairness of maintenance fee	Some villagers complaint that they cannot pay the same amount as others because they are using less than others due to distance from the tapstand or irregular supply.	Fees should be collected on a volumetric basis instead of a fixed amount. For this, the water meter is useful to determine the exact amount consumed by each user.

Evaluation of Technologies

- In spite of the high initial cost and skill requirements for construction, the GFS scheme is technically sustainable and therefore can be considered as the most feasible scheme, and this conforms to the preference of the target villages.

Water Supply Facility

Parameter		GFS	Borehole		Dug Well		Protected Spring	Rainwater Collection
			w/HP	w/MP	Manual	w/HP		
Technical Survey		○	×	×	×	×	○	○
Environmentally Sound		○	○	△	△	○	○	△
Construction Skills		△	×	×	○	△	△	△
Cost	Initial	×	×	×	△	△	○	○
	Recurrent	○	△	×	○	△	○	○
Convenience		○	○	○	△	○	×	○
VLOM		○	○	×	○	○	○	○
Replicable		△	×	×	○	△	○	○
Sustainable		○	△	△	○	△	○	○
Appropriate Technology		○	△	×	○	△	○	○
Overall		○	△	×	○	△	○	○

N.B.: GFS: Gravity fed system, HP: Handpump, MP: Motorized pump
VLOM: Village level operation and maintenance
○: Easy, low, good; △: Intermediate, medium, average; ×: Difficult, high, poor

- All types of latrines are technically feasible, but if sufficient water is available, the pour flush and septic tank type latrines are the most acceptable, but the pour flush type latrine is more preferable in consideration of costs.

Latrine

Parameter	Pour Flush	VIP	Septic Tank	Lid or Cover	Conventional
Environmentally Sound	×	×	○	×	×
Construction Skills	○	○	△	○	○
Cost	△	△	×	○	○
Sanitary	○	△	○	×	×
Flies and Odor	○	○	○	△	×
Replicable	△	○	△	○	○
Sustainable	○	×	○	×	×
Appropriate Technology	○	○	○	○	○
Overall	○	△	○	△	△

N.B.: VIP: Ventilated improve pit
○: Easy, low, good; △: Intermediate, medium, average; ×: Difficult, high, poor

6.4 Financial Plan

The total project cost is broken down as follows.

Contributions from Village:	Cash, labor, local materials (sand, gravel, timber, thatching, etc.), others (food and accommodations for technician, miscellaneous expenses)
Support from Lao Government:	Technical support, training, hygiene promotion, dispatch of technicians for major repairs, monitoring of behavioral changes
External Support:	Procurement of construction materials and equipment, transportation of these to each village

- The pilot study villages contributed on the average about 33% of the total cost.
- The villages of the Pilot Study are situated in the remotest areas, are very poor with the majority being ethnic minorities, and difficulties for making contributions would arise if the same stringent concepts are equally applied creating unfairness.
- Since the Sector Strategy is in the transitional stage, progressive introduction of a weighted approach to subsidy should be considered.
- No subsidy is provided for operation and maintenance of the facilities which is the responsibility of the beneficiary villagers, in line with the Sector Strategy.
- The Pilot villages are collecting an average of about 100 kip/person/month as operation and maintenance fee, which is about 0.3% of the their average income. This is a reasonable amount if only routine maintenance is considered.
- In consideration of emergency situations or replacements, the monthly water fee for GFS villages should be raised to about 1,100 kip per person equivalent to about 3% of their average income to create a sustainable system. Therefore, continued guidance on operation and maintenance is required to produce this motivation.

CHAPTER 7 PROPOSED DEVELOPMENT ALTERNATIVES

7.1 Proposed Facilities Implementation

Out of the total of 81 study target villages, 34 villages were implemented as pilot study and 17 additional villages were further implemented as pilot study extension. This means that remaining 30 villages are the target villages for future project implementation. However, some changes need to be made for the following reasons.

- Two villages in Viengphoukha District, V-3 Donemay and V-4 Nam Phae, have been resettled and are now joined together as one village with the name Nam Phae for which we will code it as V-3.
- Sakon village of V-7 Sakon/Layloth will be implemented by an NGO, so only Layloth will be kept as V-7 Layloth.
- One village in Long District, L-25 Phatae May, has rejoined its original village of L-16 Phatae Kao. Now the two villages combined as one is named simply Phatae, and we will code this village as L-16.

Therefore, the total number now becomes 28 villages. The list of the target villages and the water supply and sanitation facilities chosen by the villages are listed in the following page.

The facilities planned for the project are: 17 GFS schemes, 3 dug wells, and 2 undecided for a total of 22 water supply schemes; while all 28 villages chose pour flush latrine as their sanitation facility. Two villages planned for dug well construction originally chose borehole during the village survey in Phase I, but the pilot study results determined that development of unconfined groundwater is difficult in this area. Therefore, since the next appropriate technology is dug wells with handpumps, upon discussions with Provincial concerns, dug wells are planned for these villages. Furthermore, 2 villages replied that they were already satisfied with their existing water supply facilities. However, in consideration of the Lao side feeling that during the community dialogue at the time of implementation, the villages might request some kind of water supply scheme, and so these are listed as undecided. Construction of the pour flush type latrine was requested by all 28 villages.

Therefore, the decision on their final choice of facilities needs to be confirmed through community dialogue before planning the implementation of these facilities.

List of Project Villages and Facilities to be Implemented

Province	District	Village Code	Village Name	Facility Chosen by Village	
				Water Supply	Latrine
Bokeo	Houayxai (14 villages)	H-6	Ban Nam Deua	GFS	Pour Flush
		H-10	Ban Phousene	Undecided	Pour Flush
		H-11	Ban Bolek	Undecided	Pour Flush
		H-12	Ban May Ngang	GFS 1 scheme 5 villages	Pour Flush
		H-13	Ban Done Gneng		Pour Flush
		H-14	Ban Mayhya		Pour Flush
		H-15	Ban Namtoi		Pour Flush
		H-16	Ban Xaychaleun		Pour Flush
		H-33	Ban Nampouktay	GFS	Pour Flush
		H-34	Ban Nampoukkang	GFS/1 scheme 2 villages	Pour Flush
		H-35	Ban Done Xay		Pour Flush
		H-36	Ban Nam Samoktay	Dug Well	Pour Flush
		H-38	Ban Done Xavanh	GFS	Pour Flush
		H-39	Ban Nam Saen	GFS	Pour Flush
Luang Namtha	Viengphoukha (4 villages)	V-2	Ban Nam Paman	Dug Well	Pour Flush
		V-3	Ban Nam Phae	GFS	Pour Flush
		V-5	Ban Phoulan	GFS	Pour Flush
		V-7	Ban Layloth	Dug Well	Pour Flush
	Long (10 villages)	L-3	Ban Pang An	GFS	Pour Flush
		L-5	Ban Don Savang	GFS	Pour Flush
		L-10	Ban Sivilay	GFS	Pour Flush
		L-16	Ban Phatae	GFS	Pour Flush
		L-17	Ban Silimoun	GFS / 1 scheme 2 villages	Pour Flush
		L-18	Ban Pheo Yae		Pour Flush
		L-19	Ban Cha Yi	GFS	Pour Flush
		L-20	Ban Khalung	GFS	Pour Flush
		L-22	Ban Namoun	GFS	Pour Flush
		L-24	Ban Paxang	GFS	Pour Flush
Total			28 villages	22 schemes (17 GFS) (3 Dug Well) (2 Undecided)	28 villages (All Pour Flush)

N.B.: GFS = gravity fed system

7.2 Cost Estimation

The rough cost estimations of the water supply and sanitation facilities for each of the target village are shown in the following table. The total project cost is about US$309,000.

Cost Estimation of Facilities

Village Code	Village Name	Cost Estimation (US$)		
		Water Supply		Latrine Cost
		Scheme	Cost	
H-6	Ban Nam Deua	GFS	17,100	3,490
H-10	Ban Phousene	Undecided	0	830
H-11	Ban Bolek	Undecided	0	1,040
H-12	Ban May Ngang	GFS 1 scheme 5 villages	53,600	240
H-13	Ban Done Gneng			200
H-14	Ban Mayhya			480
H-15	Ban Namtoi			1,110
H-16	Ban Xaychaleun			590
H-33	Ban Nampouktay	GFS	12,000	970
H-34	Ban Nampoukkang	GFS/1 scheme 2 villages	30,000	5,310
H-35	Ban Done Xay			2,300
H-36	Ban Nam Samoktay	Dug Well	12,600	2,340
H-38	Ban Done Xavanh	GFS	9,600	1,990
H-39	Ban Nam Saen	GFS	7,900	2,720
V-2	Ban Nam Paman	Dug Well	18,900	1,000
V-3	Ban Nam Phae	GFS	5,100	4,900
V-5	Ban Phoulan	GFS	20,000	1,800
V-7	Ban Layloth	Dug Well	12,600	1,950
L-3	Ban Pang An	GFS	3,900	1,000
L-5	Ban Don Savang	GFS	12,600	2,000
L-10	Ban Sivilay	GFS	9,300	1,500
L-16	Ban Phatae	GFS	7,300	2,100
L-17	Ban Silimoun	GFS / 1 scheme 2 villages	14,600	1,500
L-18	Ban Pheo Yae			1,300
L-19	Ban Cha Yi	GFS	3,200	700
L-20	Ban Khalung	GFS	4,600	700
L-22	Ban Namoun	GFS	4,000	450
L-24	Ban Paxang	GFS	4,700	750
Sub-Total			263,600	45,260
Grand Total			**$308,860**	

N.B.: GFS = gravity fed system

7.3 Prioritization of Alternatives

The target villages for project implementation will be prioritized for successive implementation with the ranking of 1 for top priority, 2 for intermediate priority, and 3 for low priority as listed below. The prioritization is made on (1) urgency for development by the Lao side, (2) high willingness to contribute by the village, and (3) shortage of existing water supply. However, the total cost for implementation of these villages may be sufficient as a one-package project.

Prioritization of Target Villages for Project Implementation

Village Code No.	Village Name	Priority Ranking	Village Code No.	Village Name	Priority Ranking
Bokeo Province			*Luang Namtha Province*		
Houayxai District			Viengphoukha District		
H-6	Ban Nam Deua	1	V-2	Ban Nam Paman	1
H-10	Ban Phousene	3	V-3	Ban Nam Phae	1
H-11	Ban Bolek	3	V-5	Ban Phoulan	1
H-12	Ban May Ngang	2	V-7	Ban Layloth	1
H-13	Ban Done Gneng	3	Long District		
H-14	Ban Mayhya	2	L-3	Ban Pang An	2
H-15	Ban Namtoi	2	L-5	Ban Don Savang	1
H-16	Ban Xaychaleun	2	L-10	Ban Sivilay	2
H-33	Ban Nampouktay	2	L-16	Ban Phatae	1
H-34	Ban Nampoukkang	2	L-17	Ban Silimoun	1
H-35	Ban Done Xay	3	L-18	Ban Pheo Yae	1
H-36	Ban Nam Samoktay	1	L-19	Ban Cha Yi	1
H-38	Ban Done Xavanh	1	L-20	Ban Khalung	1
H-39	Ban Nam Saen	1	L-22	Ban Namoun	2
			L-24	Ban Paxang	1

7.4 Project Implementation Program

Since the present Study is scheduled to end in March 2001, the remaining target villages cannot be implemented within the scope of this Study. The Lao side desires continued assistance from the Japanese government to realize the project. Therefore, if Japanese assistance is to be considered, the schemes listed below can be considered for their implementation.

- General grant aid project: The scale of the project is too small for this type of assistance
- Grant assistance for Grassroots projects: Since this is suitable for small scale assistance, the project may need to be subdivided, for example, by Province.

- Welfare development assistance program: Model welfare projects can be implemented through local organizations such as NGOs and consultants.
- Development partnership program: This is the most recommendable method as a one-package request.

Since Lao P.D.R. is implementing similar projects assisted by other donors, assistance for this Project should also be considered from these other organizations such as ADB and World Bank. Therefore, the request should be made as soon as possible to the donor organizations for implementation without delay.

CHAPTER 8. CONCLUSION AND RECOMMENDATIONS

The conclusions made through the implementation of this Study are as follows.

(1) This Study has significantly achieved the set objectives.
(2) This Study has applied a demand-oriented approach wherever possible, but the nature of this Study required maintaining supply-oriented concepts with appropriate application of the merits of both approaches.
(3) The Study has involved target villagers, both men and women, in participatory planning which encouraged a greater sense of ownership to sustain the system.
(4) Good cooperation and support from concerned personnel from different levels of agencies are a few of the contributing factors to the success of this study.
(5) GFS water schemes and latrines are easier for communities to realize participatory activities because they require high level contributions. Whereas, boreholes receive low participation due to low requirements for community involvement.
(6) After completion of the water supply and sanitation facilities, social and economic impacts on the livelihood of the communities were noticeably observed even during the short period of about three months.
(7) In most of the pilot villages, the WATSAN (water and sanitation) committees need further training in operation and maintenance and management of the facilities.
(8) Village contributions should not be a forced effort, but rather a motivation effort in consideration of a balance between willingness-to-pay (in relation to the benefits conceived) and ability-to-pay.

As a result of implementing this Study, the following lessons and experiences were identified for enhancing future development studies and projects.

(1) The more needy the people are, the more motivated they are. The communities having self-help efforts, high self-sufficiency and pressing water needs were more participatory and cooperative with high ownership.
(2) Participatory approaches and techniques, such as community dialogue, PRA and PCM were proven effective for sustainable development of water supply and sanitation.
(3) Cultural and gender needs at all levels must be taken into consideration and incorporated during all stages of the study.

(4) Good coordination and cooperation among different sectors at all levels involved directly or indirectly in the study can contribute to its success.

(5) Counterpart staff should apply the concept of learning-through-sharing to identify actual needs of the villagers and to formulate an effective solution to sustainable development.

(6) Promotion of sanitation through the construction of latrines in a village can serve as model case for neighboring villages in motivating them to want their own latrines to heighten their awareness towards sanitation.

(7) Experiences learned through on-the-job training are considered to be most effective for capacity building of Provincial and District level personnel.

In consideration of the above topics, the following recommendations and suggestions can be made.

(1) The procedures used in this study as well as the lessons learned can be applied as model for other Provinces having similar socio-economic and environmental conditions.

(2) During the baseline survey and selection of target villages, enough time should be spent for in-depth assessment by using participatory techniques such as community dialogue, RRA and PRA. Also, various sources of information should be collected by interviewing different groups of people.

(3) The level of village contribution should consider an appropriate balance between willingness-to-pay (resulting from the extent of benefits anticipated) and ability-to-pay. Subsidies in consideration of the less affluent, more remote and ethnic minority villages are quite significant for future developments.

(4) A follow-up plan for sanitation improvement needs to be developed by concerned sectors. This should be followed by regular visits by District Nam Saat in collaboration with the concerned sectors at District level to promote behavioral change among people in the pilot study villages.

(5) Central Nam Saat in collaboration with Provincial level staff must follow up on the Sector Strategy and its dissemination with the District level offices. Practical breakdown guidelines which are easier to read and understand should be formulated to match the local situation.

(6) Assistance is needed to Provincial and District Nam Saat in developing an operation and maintenance follow-up program to ensure sustainability of the implemented villages.

(7) In pursuit of long-term capacity building, a long-term advisor is required to provide technical and managerial assistance to Nam Saat offices at Provincial level.

(8) Exchange and coordination activities should be carried out with other international donors and NGOs implementing similar activities to share information and experiences, and to avoid possible overlapping or repeated negative experiences.