

6.5 Financial Plan

6.5.1 Financial Costs

The external project cost is estimated at about US\$309,000. The detailed breakdown for each village is presented in the next chapter. This cost covers only the materials and equipment for construction of water supply and sanitation facilities as well as transportation costs to deliver the materials and equipment to each village.

Other costs including labor, local materials and miscellaneous expenses will be borne by the beneficiary villages. The total project cost is broken down as follows.

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

The contributions from the villages of the pilot study along with the external support costs are tabulated in the next page. The table shows that the villages contributed on the average about 33% of the total cost. This means that about 67% was subsidized from external sources, which is higher than the Nam Saat approach as promoted in the Sector Strategy. However, these figures are the actual realities for ability-to-pay in relation to willingness-to-pay. That is, in consideration of the fact that the villages of the Pilot Study are situated in the remotest areas, are very poor with the majority being ethnic minorities, difficulties for contributions and payment would arise if the same stringent concepts are equally applied creating unfairness. Since the Sector Strategy itself is constantly evolving, this can serve as a step in the progressive introduction of a weighted approach to subsidy.

Table 6-16 Ratio of Village Contributions to Total Cost (Unit: US\$)

Code No.	Village Name	Water Scheme	Village Contribution (A)	External Support (B)	Total Cost (C)	Ratio (A/C)
H-1	Poung	GFS	6,130	27,570	33,700	18%
H-3	Nam Ngao	Dug Well	330	6,500	6,830	5%
H-7	Namma	GFS	2,500	14,000	16,500	15%
H-9	May Phattana	Borehole	1,660	14,000	15,660	11%
H-17 to H-25	Maynignom, Thongsenchon, Xiengnam, Nongneun, Nale, Chomchouk, Paksang, Mayphoukha, Namhotay	GFS	47,990	70,390	118,380	41%
H-31	Done Keo	GFS	2,500	11,340	13,840	18%
H-32	Hat Phouan	GFS	1,340	6,000	7,340	19%
H-37	Leang	Borehole	590	14,000	14,590	4%
P-1 to P-9	Phiengkham, Thinkeoneua, Thinkeokang, Thinkeotay, Phaoudom, Nathong, Phonexay, Somsavang, Sonexay	GFS	39,110	19,460	58,570	67%
V-6	Pangxai	GFS	1,640	12,300	13,940	12%
V-8	Nam Seua	GFS	2,900	3,000	5,900	49%
L-1 L-2	Xiengkok May Xiengkok Kao	GFS	7,720	17,830	25,550	30%
L-4	Luang	GFS	2,420	9,000	11,420	21%
L-13	Chakhamping	GFS	740	5,000	5,740	13%
L-15	Tin That	GFS	2,520	9,000	11,520	22%
L-21 L-12	Daen Kang Hoai Mo	GFS	5,360	11,000	16,360	33%
Total			125,450	250,390	375,840	33%

The ratios of village contributions to total cost for each facility are as follows.

- GFS schemes/Latrines about 36%
- Dug wells and Boreholes about 7%

Since most of the works for well construction were done by the contractor, which is especially true for boreholes, the above ratio shows that villagers are reluctant to give contributions for well construction. Due to time constraints, the dug well was also constructed by a contractor which gave rise to high initial costs, thus low village contribution ratio.

Another interesting result is that the contribution ratio for the Pha Oudom scheme is very high at 67%, which would imply a high sense of ownership. However, due to the low flow rate of the water source, the scheme was originally designed to supply water to only 3 or 4 villages. Nevertheless, since all 9 villages desperately needed water, they agreed to share the limited supply at the consequence of reduced per capita supply rates. This means that the villagers cannot get full advantage of a standard system, but have contributed the same as other villages which are getting sufficient supply. This predicament further complements the solidarity of the villages and their sincere assurance towards ownership.

6.5.2 Recurrent Costs

No subsidy is provided for operation and maintenance of the facilities, neither for repairing nor rehabilitation. In line with the Sector Strategy, these activities must be the responsibility of the beneficiary villagers focusing on community based operation and management.

The recurrent costs required for sustained operation and maintenance would include payments to village volunteers taking care of the facilities, cost for spare parts of minor repairs, deposit for major repairs or extensions/replacements, and transportation cost for informing the District and Province, among others. The requirements for operation and maintenance of the Pilot villages are listed below.

Table 6-17 Recurrent Cost Requirements for Operation and Maintenance

Code No.	Village Name	Water Scheme	Recurrent Cost for Routine Maintenance (kip/pers/mon)	Required Investment for Replacement (kip/pers/mon)	Total Required Recurrent Cost (kip/pers/mon)
H-1	Poung	GFS	139	2,200	2,339
H-3	Nam Ngao	Dug Well	123	800	923
H-7	Namma	GFS	125	1,500	1,625
H-9	May Phattana	Borehole	164	5,000	5,164
H-17 to H-25	Maynignom, Thongsenchai, Xiengnam, Nongneun, Nale, Chomchouk, Paksang, Mayphoukha, Namhotay	GFS	105	1,000	1,105
H-31	Done Keo	GFS	125	2,000	2,125
H-32	Hat Phouan	GFS	158	2,000	2,158
H-37	Leang	Borehole	109	2,600	2,709
P-1 to P-9	Phiengkham, Thinkeoneua, Thinkeokang, Thinkeotay, Phaoudom, Nathong, Phonexay, Somsavang, Sonexay	GFS	52	230	282
V-6	Pangxai	GFS	100	3,000	3,100
V-8	Nam Sua	GFS	85	400	485
L-1	Xiengkok May	GFS	136	1,050	1,186
L-2	Xiengkok Kao	GFS	112	1,350	1,462
L-4	Luang	GFS	107	2,100	2,207
L-13	Chakhamping	GFS	147	1,600	1,747
L-15	Tin That	GFS	117	1,300	1,417
L-21	Daen Kang	GFS	100	1,186	1,286
L-12	Hoai Mo	GFS	97	1,030	1,127
Average			132	2,800	2,932
			97	1,030	1,127
			132	2,800	2,932

The Pilot villages are currently collecting an average of about 100 kip/person/month as the operation and maintenance fee, which is about 0.3% of their average income. This amount is reasonable to balance the requirements for routine expenses. However, in consideration of emergency situations or replacements, the monthly water fee for GFS villages needs to be raised to about 1,100 kip per person which is equivalent to about 3% of their average income, but for villages using wells, the monthly fee has to be increased to about 2,900 kip per person or about 8% of their income. The raised amount for GFS villages is a reasonable figure in relation to their income and realistic to create a sustainable system. On the other hand, for well villages, collecting 8% of their income may be very difficult, in which case, they may need further external assistance. Diligent and continued guidance on operation and maintenance is required to create such motivation.

6.6 Environmental Analysis

An Initial Environmental Examination (IEE) was carried out at the beginning of the development study considering existing data and information, and reference with similar studies and projects concerning water supply and water resources development. Also we evaluated the environmental impact for which the rural water supply and sanitation improvement study can cause if it is actually implemented. However, since this type of implementation would not give a significant influence to the environment, the following initial factors will be considered for examination in view of sustained development of Lao PDR and plan for improving the living standard of the rural population.

- (1) Water resource is an integral element of the natural environment and a socio-economic element of the Lao culture.
- (2) STENO (Science, Technology and Environmental Organization) is responsible for the review of environmental issues in the country.
- (3) This rural water supply and sanitation study which includes water resources development is considered to recognize the national environmental policy on preservation of forests, land and water resources while maintaining the livelihood of the rural population.

The environmental conditions of the project area are listed below and the results of environmental scoping are presented in the attached table.

Table 6-18 Environmental Conditions of Project Area

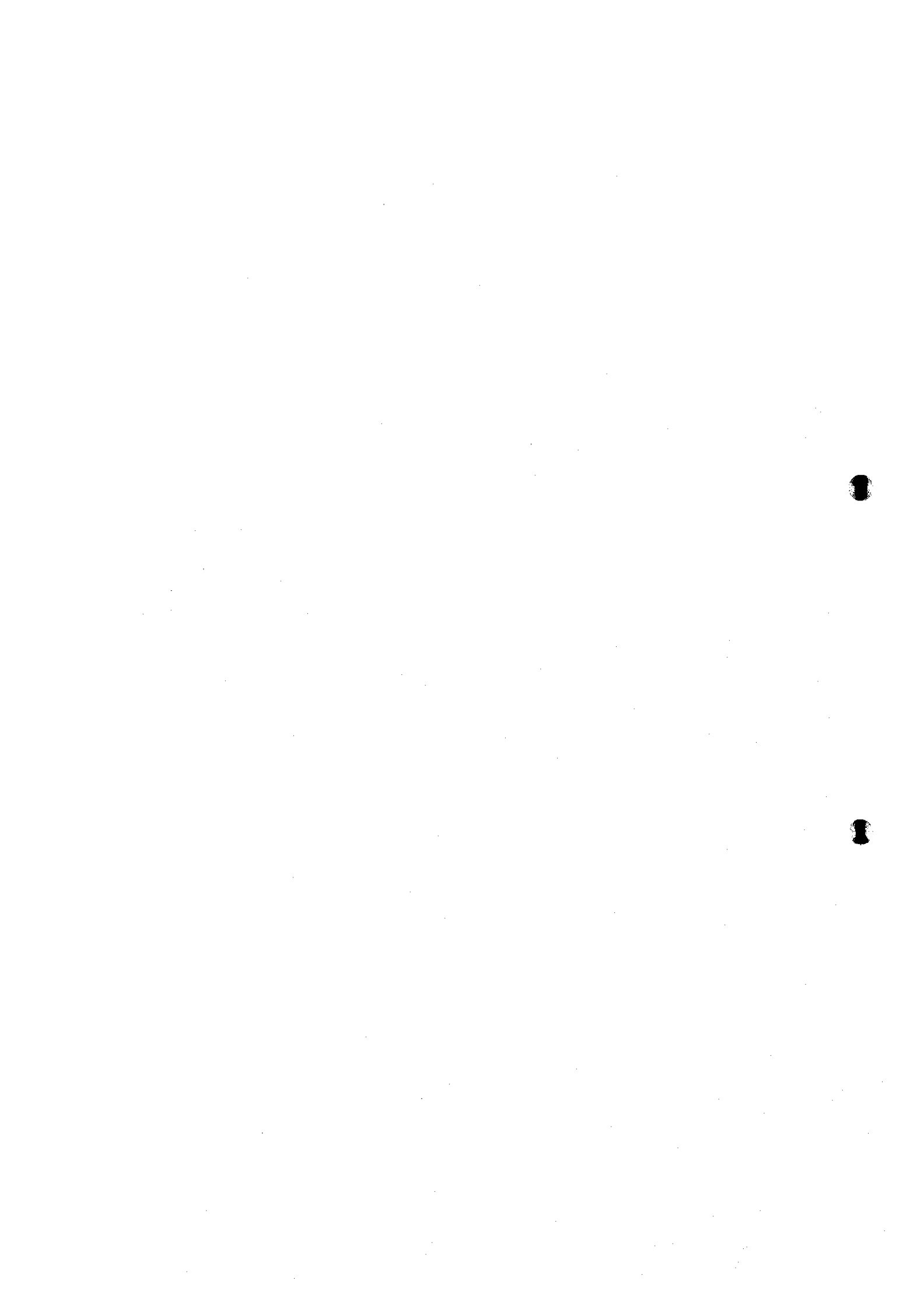
Environmental Parameter		Description
Social Environment	Community population (residents, native residents, awareness towards plan, etc.)	Safe and stable water will be supplied, and sanitary latrines will be installed. Villagers' awareness towards water is very high but low for sanitation.
	Facilities related to living (rivers/streams/ wells/other water supply, latrines, electricity, etc.)	Some villages have existing water supply but insufficient and unsafe. Some villages have existing latrines but insufficient and deteriorated. No electricity in target villages.
	Sanitation and hygiene (diseases, hospitals, customs, etc.)	Improvements are needed through sanitation education and hygiene promotion.
Natural Environment	Topography and geology (slopes, soft soils, wetlands, faults, etc.)	Careful consideration required in designing the pipeline routing for GFS and location of tanks and tapstands. Survey required for proper selection of drilling points.
	Groundwater, surface water and climate (water quality, flow rates, rainfall, etc.)	Sufficient surface water for GFS is available. Deep aquifers have problem with odor. Road conditions during rainy season are very bad.
	Precious animals/plants and breeding grounds (natural parks, designated breeding areas, etc.)	None
Environmental Disruption	Possibilities for complaints (potential pollution incidents, environmental accidents, etc.)	None
	Availability of countermeasures (institutional measures, compensations, etc)	Not necessary

Table 6-19 Environmental Scoping Assessment

Environmental Parameter	Description	Impact	Justification
Social Environment	Change of residences	Removal of residences due to land use for project siting	No Facilities siting does not influence residences
	Economic activity	Loss of production opportunity due to facilities construction. Changes in economic structure.	Yes Increase in economic activities due to improvement in water supply and sanitation.
	Transportation and public facilities	Influence on transportation system, schools, hospitals, etc. due to traffic jams and accidents	No Short term, small scale construction works will have little influence.
	Community disunity	Separation of community society due to inconveniences arising from blockage in communication and association	No No huge facilities will be constructed to obstruct intersocialization
	Relics and cultural heritage property	Loss or decrease in value of temples, buried relics, etc.	No Will not have influence
	Water rights and admission rights	Affect fishing rights, irrigation and water rights, etc.	No Water rights can be settled through discussion. Other rights will not be influenced
	Sanitation and hygiene	Deteriorate sanitation environment due to wastes and harmful insects	No Rather improve sanitation environment
	Solid waste	Generation of construction debris, sludge, garbage, etc.	No Small scale construction will not generate much waste
	Disaster risk	Increase risk of land subsidence, cave-in, accidents, etc.	No Cannot be conceived
Natural Environment	Topography and geology	Alteration of valuable topographical and geological structures due to trenching and mounding	No No large scale alterations in topography
	Soil erosion	Soil outflow from rainwater due to site clearance or deforestation	No Only small scale land clearance and plant clearing
	Groundwater	Groundwater level lowering and contamination due to over pumping	No Handpumping at few points will not have influence
	Lakes and rivers	Alteration of flow rate and quality due to landfilling, wastewater, overpumping, etc.	No Small scale activities will not have influence
	Oceans and beaches	Contamination and shape alteration of seashores due to landfilling, wastewater, etc.	No No seashore in target area
	Animals and plants	Breeding disturbance and seedling extermination due to alteration of growth conditions	No Only small scale clearing of plants and trees
	Climate	Changes in temperature, precipitation, wind conditions, etc. due to large scale site clearance and buildings	No Small scale construction
	Scenery	Alteration of scenery and harmony due to land transformation, structures, etc.	No Small scale construction
Environmental Disruption	Air pollution	Pollution due to vehicle exhaust and harmful gases from factories	No Will not have impact
	Water contamination	Groundwater inflow of mud and oil from well drilling works. Contamination due to wastes.	No Small scale works
	Soil pollution	Pollution from penetration and diffusion of wastewater, harmful materials, etc.	No Will not generate pollutants
	Noise and vibration	Generation of noise and vibration during drilling and pumping	No Only a few drillings. Pumping by hand only
	Land subsidence	Land subsidence due to groundwater lowering	No Handpumping will not have influence
	Odor	Generation of exhaust, odorous materials, etc.	No Will not generate pollutants

The following subjects were carefully examined and discussed with the villagers during the Pilot Study. These should be included in the community dialogue with the villagers of the Project villages as well.

- (1) Conservation of forests especially upstream of the GFS intake point.
- (2) Sanitation and health education for protection against contamination from animal and human waste.
- (3) Drainage system for wastewater from the water supply facilities to be constructed in the village.



CHAPTER 7 PROPOSED DEVELOPMENT ALTERNATIVES

7.1 Proposed Facilities Implementation

7.1.1 Target Villages

As a result of selecting the pilot study villages through the elaborate selection process using selection criteria and changes made during the Phase II survey, 34 villages out of the total of 81 target villages were selected for implementation as pilot study. Then, an extension of the pilot study implemented 17 more villages. This means that 51 villages have already been implemented with 30 villages remaining. Therefore, these 30 villages not yet implemented 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.
- For the site V-7 Sakon/Layloth, one village (Sakon) will be implemented by an NGO, ADRA, this year, but Layloth village is not included in the plan. Now, since Layloth is situated farther away from the source after Sakon, if implementation in collaboration with Sakon is to be considered, problems in responsibility issues will certainly become apparent. Therefore, to avoid this situation, discussions were made with Layloth village, and the village agreed to settle for dug wells. As a consequence, V-7 will be kept as Layloth only without Sakon
- One village in Long District, L-25 Phatae May, has rejoined its original village of L-16 Phatae Kao. Now the two villages are combined together as one village named simply Phatae, and we will code this village as L-16.

Therefore, excluding the above mentioned villages, the total number now becomes 28 villages. The list of the target villages for implementation after the changes is shown in the following page.

Table 7-1
List of Target Villages for Project Implementation

Province	District	Village Code No.	Village Name	Comments
Bokeo	Houayxai (14 villages)	H-6	Ban Nam Deua	
		H-10	Ban Phousene	
		H-11	Ban Bolek	
		H-12	Ban May Ngang	
		H-13	Ban Done Gneng	
		H-14	Ban Mayhya	
		H-15	Ban Namtoi	
		H-16	Ban Xaychaleun	
		H-33	Ban Nampouktay	
		H-34	Ban Nampoukkang	
		H-35	Ban Done Xay	
		H-36	Ban Nam Samoktay	
		H-38	Ban Done Xavanh	
		H-39	Ban Nam Saen	
Luang Namtha	Viengphoukha (4 villages)	V-2	Ban Nam Paman	
		V-3	Ban Nam Phae	Donemay (V-3) and Nam Phae (V-4) joined together as Nam Phae (V-3)
		V-5	Ban Phoulan	
		V-7	Ban Layloth	Originally Ban Sakon/Layloth, but Sakon only will be implemented by an NGO
	Long (10 villages)	L-3	Ban Pang An	
		L-5	Ban Don Savang	
		L-10	Ban Sivilay	
		L-16	Ban Phatae	Phatae Kao (L-16) joined with Phatae May (L-25) as Phatae (L-16)
		L-17	Ban Silimoun	
		L-18	Ban Pheo Yae	
		L-19	Ban Cha Yi	
		L-20	Ban Khalung	
		L-22	Ban Namoun	
		L-24	Ban Paxang	
Total			28 villages	

7.1.2 Proposed Facilities

The water supply and sanitation facilities proposed for the project are as follows:

Water Supply Scheme: Total 22 schemes

- 17 GFS schemes
- 3 dug wells
- 2 undecided

Sanitation Facility: Total 28 villages

- All 28 villages chose pour flush latrine

The most requested water scheme is the gravity fed system (GFS) with 18 out of the 22 schemes being GFS. Two of the villages planned for dug well construction, H-36 and V-2, 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.

Latrine construction was requested originally by only 24 villages, but upon further survey, the remaining 4 villages became motivated to request latrines as well. Therefore, all 28 villages are requesting the pour flush type latrine.

Therefore, the decision on their final choice of facilities needs to be confirmed through community dialogue before planning the implementation of these facilities. The water supply and sanitation facilities proposed for the project villages are listed in the following table.

Table 7-2
List of 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	Pour Flush
		H-35	Ban Done Xay	2 villages	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 Phoulam	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	Pour Flush
		L-18	Ban Pheo Yae	2 villages	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.

Table 7-3
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 Kaychaleun			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 in the following table. The prioritization is determined based on the following conditions.

- urgency for development by the Lao side
- high willingness of the village to contribute and participate
- inadequacy of existing water supply facilities

However, the total cost for implementation of these villages may be sufficient as a one-package project.

Table 7-4 Prioritization of Target Villages for Project Implementation

Province	District	Village Code No.	Village Name	Priority Ranking
Bokeo	Houayxai	H-6	Ban Nam Deua	1
		H-10	Ban Phousene	3
		H-11	Ban Bolek	3
		H-12	Ban May Ngang	2
		H-13	Ban Done Gneng	3
		H-14	Ban Mayhya	2
		H-15	Ban Namtoi	2
		H-16	Ban Xaychaleun	2
		H-33	Ban Nampouktay	2
		H-34	Ban Nampoukkang	2
		H-35	Ban Done Xay	3
		H-36	Ban Nam Samoktay	1
		H-38	Ban Done Xavanh	1
		H-39	Ban Nam Saen	1
Luang Namtha	Viengphoukha	V-2	Ban Nam Paman	1
		V-3	Ban Nam Phae	1
		V-5	Ban Phoulam	1
		V-7	Ban Layloth	1
	Long	L-3	Ban Pang An	2
		L-5	Ban Don Savang	1
		L-10	Ban Sivilay	2
		L-16	Ban Phatae	1
		L-17	Ban Silimoun	1
		L-18	Ban Pheo Yae	1
		L-19	Ban Cha Yi	1
		L-20	Ban Khalung	1
		L-22	Ban Namoun	2
		L-24	Ban Paxang	1
Total			28 villages	Rank 1: 15 Rank 2: 9 Rank 3: 4

Rating: Rank 1 = Top Priority
Rank 2 = Intermediate Priority
Rank 3 = Low Priority

7.4 Project Implementation Program

Since the present Study is scheduled to end in March 2001, the remaining target villages remaining after implementation of the pilot study as well as the pilot study extension 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 for these remaining target villages, the schemes listed below can be considered for their implementation.

- General grant aid project
- Grant assistance for Grassroots projects
- Welfare development assistance program
- Development partnership program
- Other assistance schemes

Implementing these villages through a general grant aid project may be difficult since the scale of the project would be too small (if only construction with procurement of materials is considered). However, if this were combined with other components in consideration of further community dialogue, monitoring and other participatory activities, as well as inclusion of supervision and promotion equipment, the package would be much more acceptable.

The other possibility would be to make use of the grassroots project scheme. In this scheme, Japanese overseas diplomatic missions can provide small-scale assistance for implementing the remaining villages through non-state entities such as NGOs established in the local area. In this case, projects may need to be subdivided, for example, by Province.

Other assistance programs make use of local NGOs, local organizations, universities and institutions to implement development projects. The welfare development assistance program implements model welfare projects through the collaboration of local JICA offices with already established local NGOs and local consultants. The development partnership program assists development projects for newly established organizations such as NGOs and universities to spur private sector implementation of ODA projects and promote participatory cooperation. Furthermore, development consultants can also participate in the implementation through the development partnership program.

In consideration of various factors, the development partnership program is the most recommendable method for implementing the remaining villages. The scale of the remaining villages is suitable 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

8.1 Conclusion

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

- (1) This Study has significantly achieved the set objectives of capacity building and improved conditions in water supply and sanitation.
- (2) This Study has fully applied a demand-oriented approach wherever possible. However, due to the fact that the main objective of this Study is improvement of water supply and sanitation facilities, this nature itself excused supply-oriented concepts to be partially kept, but to the benefit of appropriately applying 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) Confined groundwater in the target area is difficult for development due to problems with water quality and quantity.
- (7) After completion of the water supply and sanitation facilities, social and economic impacts from the study on the livelihood of the communities were noticeably observed even during the short period of about three months. Sanitation awareness improved and their behavior changed as a result of the newly acquired conveniences.
- (8) There is concern regarding sustainability upon withdrawal of JICA support.
- (9) In most of the pilot villages, the WATSAN (water and sanitation) committees need further training in operation and maintenance and management of the facilities.
- (10) District and Provincial Nam Saat still need capacity building to provide effective services and technical support in order to motivate the villagers to develop healthier lifestyles.
- (11) 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.

- (12) For the villages that were cultivating poppy, and agreed to abandon the poppy field to discontinue taking opium in favor of receiving a water supply, they have proven that water is a basic human need of the villagers and is more in demand than narcotics.

8.2 Lessons Learned

This Study has conducted Phase I through Phase III, including the Pilot Study with a Pilot Study extension. As a result of these implementations, 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) An appropriate team combination of multidisciplinary members is one of the key approaches when working with rural communities.
- (7) Start a future project with a smaller scale that is controllable and conforming to the capacity of Nam Saat and concerned departments.
- (8) 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.
- (9) Experiences learned through on-the-job training are considered to be most effective for capacity building of Provincial and District level personnel.
- (10) One method of restraining the use of narcotics may be to provide an alternative that is much more in demand for human life, such as water.

8.3 Recommendations

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, more 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 and avoid interviews with only village headmen or one group of people who may not tell the real story but only for their own interests.
- (3) Secondary key sources such as Rural Development, the State Planning Committee, the Committee for International Economic and Cooperation, and the Department of Industry and Commerce, should be collaborated with in addition to the concerned sectors to collect and analyze information more comprehensively.
- (4) Actual local demands need to be fully understood by the Provincial and District level concerns applying a learning-through-sharing concept to be incorporated into future development plans.
- (5) Support and cooperation should be continued with Nam Saat at all levels through networking with gender and ethnic minority programs in order to respond to cultural and gender needs among Provincial and District Nam Saat in accordance with the Sector Strategy.
- (6) 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 poorer, more remote and ethnic minority villages are quite significant for future development.
- (7) 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.
- (8) Concurrent implementation of both water schemes and sanitation facilities can give multiple effects to improve the sanitary conditions and raise satisfaction of the villagers.

- (9) 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.
- (10) Technology should be promoted keeping the following key points in mind.
- **Affordability:** Payable by rural people
 - **Appropriateness:** Technically easy to operate and maintain
 - **Accessibility:** Easily reached and serviceable
 - **Adaptability:** Responsive to local culture and gender
 - **Appreciativeness:** Satisfied by all beneficiaries
- (11) 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.
- (12) 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.
- (13) Financial support and resources should be provided to District level Nam Saat to implement operation and maintenance as well as advisory interventions.
- (14) 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.

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