

Aforementioned studies were carried out by the following sequence:

- Review of existing water supply systems and water sources;
- Review of planned/on-going projects;
- Establishment of planning conditions covering service level, utilization of existing facilities, water sources, and number of systems; and
- Recommendations for overall development strategy.

Table 8.4.1 presents a summary of the study results by municipality.

1) Review of existing water supply systems and water sources

At present, there are only three (3) Level III systems in the province. WDs exist in the municipalities of Catarman and San Isidro. While one privately owned small Level III system is in Catarman. Population served by these systems range from about 400 persons at the privately owned system to 2,700 persons at the Catarman WD. Water sources are wells or spring sources.

The remaining 22 municipalities out of the total 24 have no Level III system in their urban areas and are presently served by Level II systems and/or Level I facilities.

Preference is made to utilize spring sources owing to less O&M activities and cost compared to deep well with electric motor pump.

2) Review of planned/on-going projects

At present, there are no specific planned/on-going projects such as foreign donor assisted project/s.

3) Establishment of planning conditions

a. Service level

It shall be noted that a national policy for urban water supply is a Level III system as the most suitable measure. Therefore, for the investment needs of the sector development, it is assumed in this PW4SP that underserved or unserved urban population at present and in the future will be provided with individual house connections. However, it does not intend in the future to exclude Level I and II facilities from being implemented in urban areas as individual cases.

b. Utilization of existing facilities

The existing Level I and II facilities are considered to be utilized during the Phase I period. The population served by these facilities is to be absorbed by Level III service in Phase II.

Table 8.4.1 Summary of Urban Water Supply Development by Municipality

Municipality	Existing Condition	On-going/ Planned Project	Water Source Availability	Future Requirements
Allen	There is no Level III system at present. They use Level I with deep wells in urban area (8,500 population). The municipal government is seeking for a sufficient water source for the population, since the shallow wells have high iron contents. The municipality has plans of the establishment of a Level III system and made negotiations with LWUA for its realization before the year 2004. F/S is on process at present.	Plan (creation of Level III)	The spring is only potential source for the development of Level III water supply. Deep well development may be very risky. Solo shallow well area covers urban barangays. But water quality of iron groundwater is locally observed.	Creation of new Level III system is required. LWUA study shall be proceeded.
Bin	Bin is an island municipality. There is no Level III system at present. They use Level I with shallow wells in poblacion area (2,600 population).	None	The potential water sources are springs. There are a few springs near urban area, but their yields may be small. The improved dug well with large diameter is recommendable for future establishment of Level III water supply.	New system shall be created. F/S including technical study on water source development (radial well with perforated pipes for collection of ground water) is required.
Bobon	There is no Level III system at present. They use Level I with deep wells in poblacion area (5,000 population).	None	Deep well development is recommendable for future establishment of Level III water supply. Deeper aquifers may have water quality problems such as iron-water and saline water intrusion. Thus, deep well depth of 40m is recommendable. Target aquifers exist in the fluvial deposits along Bobon River. Production capacity is estimated at about 1,000 cum/d or more. The Colganic River may be alternative water source in the future.	New system shall be created. F/S including technical study on ground water source development is required.
Capul	Capul is an island municipality. There is no Level III system at present. They use Level II systems and Level I facilities in poblacion area (4,300 population). The municipality has made representations with LWUA for the upgrading from existing Level II system to Level III.	Plan (upgrading to Level III)	There is high possibility of existence of untapped springs having high yield available for Level III water supply.	New system shall be created. LWUA study shall be proceeded.
Cataman	There are Cataman WD and privately owned small Level III system. About 2,600 population in urban area (8% of urban population) are served by these waterworks. The WD and private waterworks are using deep and shallow wells as their water sources, respectively. The WD practices scheduled water supply due to insufficient water source. The WD is planning to develop another deep well at present.	On-going (construction of Macagtas Dam)	Deep well development is recommendable for expansion of the system. Deeper aquifers may have iron-water and saline water intrusion. Thus, deep well depth of 40m is recommendable. Target aquifers exist in fluvial deposits along Cataman River. Production capacity is estimated at about 1,000 cum/d or more.	System expansion with water source augmentation is required. Study on deep well development is a requisite

Table 8.4.1 Summary of Urban Water Supply Development by Municipality (Cont'd.)

Municipality	Existing Condition	On-going/ Planned Project	Water Source Availability	Future Requirements
Catubig	There is no Level III system at present. They use Level I facilities and Level II systems in urban area (4,600 population). Presently, negotiations on proposed Help Catubig's Agricultural Advancement Project, Stage I (HCAPP) is on going. The components of the project include irrigation and Level III water supply. The proposed water source is the spring located upstream of Catubig River (Pimpisakan Falls).	On-going (HCAPP)	Acidic river water quality may be encountered, which is assumed from the FIS report on surface water development for Catubig City WD conducted in 1991. Alternative water source is spring. Improved dug well is also recommendable for future Level III water supply. Such dug well field is located on fluvial deposits along Catubig River. Deep well may have poor yields, deeper depth and lower static water level.	Creation of Level III system under HCAPP is required. Upgrading from existing Level II system shall be considered. Financial source shall be secured.
Gamay	There is no Level III system at present. They use Level I facilities (shallow/deep wells) in urban area (2,800 population). Existing Level II system is non-operational. Municipality is furnishing proposal of development plan of Level III system to the possible funding agencies.	Plan	The spring is only potential and economical water source for the development of Level III water supply. Deep well development is not recommendable because of poor yields. Saline water intrusion is found in coastal area.	Creation of Level III system is required. Technical study on spring source development is a requisite. The proposal shall be proceeded to realize new Level III system.
Luanang	Luanang is an island municipality. There is no Level III system at present. Urban population is about 11,000. Through water supply program of the Northern Samar Integrated Rural Development Project (NSIRDIP), a waterworks system was constructed with a reservoir and two diesel engine pumps. However, the system was a complete failure because there was no sufficient water from two production wells. Presently town proposer is supplied from mainland barangays.	None	If there is no spring sources with enough yield for Level III water supply near urban area, alternative water source is deep well in mainland where is made of fluvial deposits along Catubig River. The deep well specifications are: 40m in depth and production of about 1,000 cum/d or more.	Cost effective manner of water supply shall be studied considering current water supply practices.
Lapinig	There is no Level III system at present. They use Level I facilities (shallow/deep wells) in urban area (3,700 population). The municipality has six principle rivers to be tapped for future water supply.	None	The river water intake point shall be studied with a due consideration of quality and quantity. Thus, the river water quality examination shall be conducted through the year. Spring is alternative source. Deep well development is not recommendable because of poor yields. Saline water intrusion is observed in coastal area.	Creation of Level III system is required. Technical study on water source development is a requisite.
Las Navas	There is no Level III system at present. They use Level II system in urban area (3,700 population). Las Navas is one of target areas for HCAPP in which the negotiation is still on-going.	None	The recommendable water source is a spring. Alternative water source is improved dug well. Such dug well field is located on fluvial deposits along Catubig River. Deep well may have poor yields, deeper depth and lower static water level.	The proposed Level III system under HCAPP shall be extended to the municipality.

Table 8.4.1 Summary of Urban Water Supply Development by Municipality (Cont'd.)

Municipality	Existing Condition	On-going/ Planned Project	Water Source Availability	Future Requirements
Lavezares	There is no Level III system at present. They use Level I facilities or Level II systems in urban area (6,300 population).	None	There are 24 spring sources that can be tapped.	New system shall be created. Technical study on spring development is a requisite. Upgrading from existing Level II system shall be considered.
Lopez Vega	There is no Level III system at present. They use Level I facilities and Level II systems in urban area (2,500 population). There are some principal rivers and major river (Catarman River) that can be tapped for future water supply.	None	The spring is better water source for future establishment of Level III water supply. Deep well is good for Level I only. Hence, river water from Catarman River may be considered finally. The intake point of river water shall be studied with water quality.	Creation of Level III system is required. Technical study on water source development (spring) is a requisite.
Mapanao	There is no Level III system at present. They use Level I (shallow/deep wells) in urban area (2,200 population).	None	The spring is only potential and economical water source for Level III water supply. Deep well development is not recommendable because of poor production.	New system shall be created. Technical study on spring development is a requisite.
Mondragon	No Level III system exists at present. They use Level I facilities in urban area (5,500 population). There are many water sources (groundwater and Bugko River) can be feasible for Level III.	None	Groundwater development has availability for future establishment of Level III water supply. The well specifications are: depth of 40m and production capacity of about 1,000 cu.m/d or more. Deep well field may be expected along Bugko River, where alluvial deposits exist.	New system shall be created. Technical study on water source development (deep well with due consideration of saline water intrusion) is a requisite.
Palapog	No Level III system exists at present. They use Level I facilities in urban area (6,200 population).	None	Groundwater sources may have enough capacity for future establishment of Level III water supply. The well specifications are: depth of 40m and production capacity of about 1,000 cu.m/d or more. Deep well field may be located along river. Spring source is also considered as alternative water source.	New system shall be created. Technical study on water source development (deep well) is a requisite.
Pambujan	No Level III system exists at present. They use Level I facilities and Level II systems in urban area (10,000 population). Illegal connection to Level II systems is a current problem.	None	Groundwater development may have enough capacity for future establishment of Level III water supply. The well specifications are: depth of 40m and production capacity of about 1,000 cu.m/d or more. Deep well field may be projected along Pambujan River.	New system shall be created. Technical study on water source development (deep well with due consideration of saline water intrusion) is a requisite. Upgrading from existing Level II system shall be considered.

Table 8.4.1 Summary of Urban Water Supply Development by Municipality (Cont'd.)

Municipality	Existing Condition	On-going/Planned Project	Water Source Availability	Future Requirements
Rosario	No Level III system exists at present. They use Level I facilities in urban area (2,400 population). There are sufficient spring sources located 3 km away from poblacion.	None	The untapped springs located in southern mountainous area is potential source for Level III water supply.	New system shall be created. Technical study on spring source development is a requisite. F/S shall be conducted.
San Antonio	San Antonio is an island municipality. No Level III system exists at present. They use Level I facilities and Level II systems in urban area (7,400 population).	None	The spring is only potential water source for the development of Level III water supply. Shallow wells have water quality problem of high iron content locally. Saline water intrusion is also observed along coastal area.	New system shall be created. Technical study on spring source development is a requisite. Upgrading from Level II system shall be considered.
San Isidro	There is a WD partially operating in its system. Water source is spring. The construction of the system is still on-going. Current served population is estimated at 900 (about 30% of urban population).	On-going (Level III system)	The spring is only potential source for future expansion of Level III water supply. Water source development both by shallow and deep well is considered very risky.	System expansion with water source augmentation using spring source is required.
San Jose	No Level III system exists at present. They use Level I facilities and Level II system in urban area (3,100 population). There are some spring sources in nearby barangays that can be tapped for future water supply. The municipality is now contacting LWUA to create a WD.	Plan	The spring is potential water source for Level III water supply. Alternative water source may be deep well. In this case, the specification of deep well are: depth of 40m, production capacity of 1,000 cu.m/d or more. Deeper aquifers may have water quality problems such as high iron contents/saline water intrusion.	New system shall be created. Technical study on water source development (spring/deep well) is a requisite.
San Roque	No Level III system exists at present. They use Level I facilities and Level II system in urban area (3,400 population).	None	Groundwater sources may have enough yields for future establishment of Level III water supply. The well specifications are: depth of 40m and production capacity of about 1,000 cu.m/d or more. Deep well field may be located along Pambujan River.	New system shall be created. Technical study on water source development (deep well) with a due consideration of saline water intrusion) is a requisite.
San Vicente	San Vicente is an island municipality. No Level III system exists at present. They use Level I facilities in urban area (2,400 population). There is a spring developed by NSIRDP but it was failure due to technical problems (the system was designed without due consideration of hydraulic characters). Municipal government is willing to rehabilitate this through loans from LWUA to create a Level III system.	None	If there is no spring sources with enough yields for Level III water supply near urban area, the improved dug well with large diameter is considered as alternative water source.	New system using spring source developed under NSIRDP shall be created. Technical study on water supply system is a requisite. Rehabilitation/improvement of existing Level II system shall be considered to realize upgrading to Level III. Financial source shall be secured.

Table 8.4.1 Summary of Urban Water Supply Development by Municipality (Cont'd.)

Municipality	Existing Condition	On-going/ Planned Project	Water Source Availability	Future Requirements
Silvino Lobos	There is no Level III system at present. They use Level I facilities or Level II systems in urban area (2,600 population). Municipal government is financially sourcing for rehabilitation of Level II to improve service coverage early in the year 2000.	On-going (Rehabilitation/improvement of existing Level II system)	The spring is better water source for future establishment of Level III water supply. Deep well is good for Level I only. River water from Pambujan River may be considered as alternative water source. River intake point shall be studied with water quality.	New system shall be created. Technical study on water source development with review of existing Level II system in consideration of upgrading to Level III is required.
Victoria	There is no Level III system at present. They use Level I facilities and Level II systems in urban area (2,700 population). The municipal government is rehabilitating and expanding the current Level II system together with upgrading to Level III. The system is expected to be initially operational by the year 2000 with assistance from LWUA. Their proposals include construction of Dam, reservoir and treatment plant getting source from Bangon Falls and Level II spring development to be implemented from the year 2000 to 2012.	On-going (upgrading from existing Level II to Level III with rehabilitation of the facilities)	The spring is only potential source for the development of Level III water supply. Deep well development is very risky. Shallow well area covers southern part of urban barangays. But ironic groundwater is locally observed.	New system using spring source shall be created with assistance from LWUA.

c. Water sources

Possibility/availability to utilize surface water and groundwater (spring and deep well) is evaluated as potential water sources for water supply development.

From the viewpoints of cost effectiveness and easy O&M of water supply system, utilization of spring sources is given due priority in the course of urban water supply planning. Application of deep wells for water source is regarded as the second priority in principle. Surface water is, on the other hand, not adopted at this moment, because of large capital investment requirements and complexity of surface water treatment.

d. Number of systems

In principle, one (1) Level III system is considered for urban area of every municipality. In the municipalities with an existing Level III system/s, the expansion of the system was first considered. In case of no existence of Level III system/s, a new system was recommended. Existing plan/s on the development of Level III/WD are also taken into account to determine the respective systems of the municipalities.

Possibility and necessity to merge service area of some neighboring municipalities to an urban water supply system were also studied from the viewpoints of:

- water source constraints, and
- economical development/scale merit of water supply system by cost reduction of water source development and other common facilities as well as O&M cost/minimized number of technical staff.

Any rural barangay/s being served by an existing urban Level III system are considered to continue throughout the future.

e. Rehabilitation

Rehabilitation of existing and future facilities is assumed to be undertaken by the operating bodies.

4) Overall development strategy

Expansion of the existing system/s was planned for those with WD/Level III, while creation of the system is considered for those without systems at present.

Merging of municipal systems (physical arrangement) in long-term is considered. Integrated management systems shall also be sought. Conditions to be studied include; water source availability, willingness by concerned municipalities and technical study on cost recovery/economic construction.

Integration of small Level III systems for operation and management shall be sought, although these systems are currently managed individually.

Some municipalities may have high potential in spring development for urban water supply. However, detailed survey to ensure appropriate developments of spring sources shall be conducted in the implementation of the projects.

(2) Rural water supply

1) Service level

Level I systems (deep well/shallow well/developed spring) are generally planned for rural areas where houses are scattered. In the PW4SP, public investment for Level I facilities covers 50% of the total number of required facilities, considering the existing share between public (44%) and private facilities (46%).

Level II systems are considered where houses are clustered and suitable untapped spring is available.

Service level standards are set forth as 15 households per source for Level I and 5 households per communal faucet for Level II, as defined in the national plan.

Application of Level III systems in rural areas may be considered in a case to case basis during actual implementation.

2) Utilization of existing facilities

The existing facilities/systems in all service levels are considered to be utilized throughout the future.

3) Water source

For Level I facilities, deep well construction is given priority wherever applicable considering safety against possible contamination and stable water supply. Standard specifications of shallow and deep wells are summarized in Table 8.4.2 based on the water source evaluation results presented in Chapter 7. Conventional construction method (driven well) may be employed under favorable substrata or hydrogeological

conditions. The standard structure of wells in the application of "open-hole drilling and gravel pack" is presented in Figure 8.4.1, Supporting Report. In addition to this, for deep well with high iron content, application of iron removal facility is recommended. The standard structure of iron removal facility is presented in Figures 8.4.2 (a) and 8.4.2 (b), Supporting Report.

Spring development is also included in Level I planning by adopting its share of 25%. This takes into account the existing percentage of developed springs (20%) among public Level I facilities in terms of safe water sources.

Table 8.4.2 Standard Specifications of Level I Wells

Specification	Shallow Well	Deep Well
Construction Method	Open-hole drilling and gravel pack	
Casing Diameter	50mm	100mm
Borehole Diameter	150mm	200mm
Ranges of Well Depth	Standard Depth	
0 - 20m	20m	Not Applicable
21 - 50m	Not Applicable	40m
51 - 100m	Not Applicable	80m
101 - 150m	Not Applicable	120m

Profile between gravel packed well and natural gravel packed well for Level I water supply:

The open-hole drilling method is employed for well construction to ensure yield of ground water from adequate aquifer in provision of proper screen location and specifications. The conventional "cased-hole driven well" shall be used only in cases where well specifications are established in the specified area with sufficient information on the hydrogeological condition including the existence of natural gravel at the expected aquifer.

It is important to study the potential areas to adopt natural gravel method, which can perform the same level of function as gravel-packed wells. Such areas are usually limited to the upper stream of larger rivers in alluvial fans and alluvial plains. The arial proportion between those in application of gravel-packed and natural gravel pack wells will be worked out referring to the condition of the province.

Modification needs of riser pipe diameter according to the water level of deep wells:

The standard specification of riser pipe of deep well hand pump is set with a diameter of 2-1/2 inch in the plan. However, water level of the deep wells may range between 20 m and around 40 m, depending on the aquifer conditions.

Although, the Malawi type deep well pump with a cylinder that is currently used in the Philippines has an operational experience of up to 40 m in pumping water level, the diameter of riser pipe shall be adjusted between 1" to 2-1/2" in order to lower required power at the pump handle (calculating required power under the specific pumping water level).

For Level II systems, only untapped springs suitable for water supply purpose are considered. However, the information on untapped springs is not available at this moment.

4) Number of systems/facilities

The number of Level I wells and spring development is estimated based on the service level standard; while the number of Level II systems coincides with the number of untapped springs.

5) Rehabilitation

Rehabilitation of existing Level I wells is not considered, since most of the wells constructed by driving method are not suited for rehabilitation to recover their functions. However, minor repair work for hand-pump and concrete apron is a requisite.

8.4.2 Sanitation

The conditions and assumptions are established for the different sanitation components to serve as guides in the implementation of projects.

(1) Household toilets

Three types of sanitary toilet facilities for individual houses are considered for Phase I; flush, pour-flush and VIP/sanitary pit privy (dry-type). While for Phase II, flush and pour-flush are planned considering the improvement of living standard.

The type of toilet facilities is dependent on the existing or planned service level of water supply in the community. In urban and rural areas with Level I or II water supply facilities, only pour-flush and/or VIP/dry type are considered, while in urban areas with Level III water supply systems, flush type toilets requiring a piped water connection are in-

cluded. Isolated rural areas where there is dearth of water supply, sanitary pit privy (dry type) is taken into account.

(2) School toilets

Standard service level currently used by DECS (40 students per unit facility) is employed for both phases.

The standard toilet facility (1 building) with 5 units of toilet bowl to serve for 200 students is adopted for the planning purpose, which is modified from PW4SP design to provide a shallow well as a water source. Since DECS is currently promoting the "one classroom-one toilet" concept, the PW4SP also adopts this concept on a 50-50 basis, that is, 50% of the school toilet requirements will be allocated using the JICA-RESP design and the other 50% will be using the new concept.

(3) Public toilets

As a minimum requirement, at least 1 sanitary toilet facility is assumed to be provided for respective utilities: public market and bus/jecpney terminal.

The standard design of DOH with 6-units of toilet bowl for the market is adopted. In this design, it is assumed that water supply will be tapped from the existing system, hence an elevated water tank is provided.

8.4.3 Urban Sewerage

The commencement of staged implementation of the sewerage program is planned in Phase II for the limited urban area (50% of urban population served by Level III system for the municipalities with urban population of more than 10,000). It is practical to start the program fully using the existing facilities to allow for lower initial investment cost than starting at once a conventional sewerage system (refer to Figure 8.4.2 Staged Improvement in Sewage Collection Method, Supporting Report).

Low cost off-site technologies such as small-bore sewer for collection of effluent from septic tank are to be adopted. Improvement of sewage collection method may be gradually achieved from combined sewer to separate sewerage system.

Sewage treatment facilities may range from community scale septic tank or Imhoff tank to aerated lagoon systems and to a more advanced treatment process such as oxidation ditch. For this PW4SP, aerated lagoon is assumed as a representative treatment facility for planning purpose. Daily average wastewater quantity is assumed to be 100 liters per capita per day.

8.4.4 Solid Waste

In terms of facility requirements, this PW4SP only studied the number of refuse collection trucks required for the year 2004. A rated capacity of 5 cu.m truck/vehicle is considered for calculation of required units of truck. Disposal of solid waste shall be studied in detail through investigations, F/S and D/D. Unit solid waste generation for urban area is assumed to be 0.418 kg. per capita per day.

8.5 Service Coverage by Target Year

8.5.1 Water Supply

The service coverage in terms of population to be served by target year was estimated by urban and rural area by municipality. The service coverage in rural area was further subdivided by service level (Level I & Level II) to finally come up with physical requirements.

Base figures applied to estimate the future service coverage and the additional population to be served are:

- provincial sector targets,
- population projection by target year, and
- base year service coverage (served population) by existing facilities.

Future requirements in terms of additional population to be served were then estimated by urban (Level III) and rural (Level I & II) area by municipality as a shortfall to meet the population to be served in each target year. The population served in base year is adopted as the population served in target year, when the former population exceeds the population to be served in the target year/s. Manner of calculation is specifically presented by phase.

(1) Phase I requirements

Additional service coverage was estimated as a shortfall of the population to be served in Phase I comparing with the population served in base year. In this connection, existing facilities both in urban and rural areas are assumed to be utilized during the Phase I period.

The utilization of untapped springs for Level II systems was given priority during Phase I period for rural water supply. At the time of this plan preparation, information on untapped springs was not available.

(2) Phase II requirements

Additional service coverage was estimated as a shortfall of the population to be served in Phase II comparing with the population served in Phase I. In this regard, existing facilities in rural area were assumed to be utilized through the two Phases, while urban population served by Level I and II facilities in base year was assumed to be absorbed by Level III service during Phase II period.

Table 8.5.1 presents the service coverage by target year and by level of service as well as the additional population to be served (details are referred to Supporting Report).

Through Phase I development, approximately 31,000 persons in the province will be served by additional water supply services, of which 9,300 persons or 30% of the total will be urban population and 21,700 persons or 70% will be rural population.

For Phase II period, a total of 287,200 persons, of which 141,600 persons or 49% in urban area and 145,600 persons or 51% in rural area, will be further benefited by water supply services. This additional service coverage in urban area includes the upgrade of service level for about 84,000 persons served by Level I and II facilities in 1998.

8.5.2 Sanitation

(1) Household toilets

The service coverage (number of households to be served) by different types of sanitary facility is estimated by urban and rural area by municipality for the years 2004 and 2010.

The future service coverage and additional households to be served are estimated to meet the provincial targets using the number of household served in the base year and the number of households in target years.

Additional number of households to be served by different type of facility by urban and rural area by municipality is the shortfall of the number of households to be served in target years comparing with either that in base year or in Phase I (details are referred to Supporting Report). However, when the number of households to be served in target year/s is less than or equal to that in base year, no additional number of households to be served is counted.

Table 8.5.1 Population to be Served by Target Year (Water Supply)

Name of Municipality	Area	Phase I Coverage (2004)						Phase II Coverage (2010)								
		Total Population			Service Coverage			Additional Population to be Served			Service Coverage			Additional Population to be Served		
		Level III	Level II	Total	Level III	Level II	Total	Level III	Level II	Total	Level III	Level II	Total	Level III	Level II	Total
Allen	Urban	10,431	1,088	5,012	6,100	1,088	1,088	907	907	10,740	10,740	9,652				
	Rural	10,119		6,083	6,083		907	907	10,968	10,968	10,219	4,136	4,136			
	Total	20,550	1,088	11,095	12,183	1,088	1,914	1,814	21,916	21,916	20,959	8,792	8,792			
Barr	Urban	2,596	271	1,598	1,869	271	271	688	688	2,691	2,691	2,420				
	Rural	7,686		4,612	4,612		688	688	8,338	8,338	7,801	3,189	3,189			
	Total	10,282	271	6,210	6,481	271	1,376	1,376	16,676	16,676	15,492	6,609	6,609			
Bobon	Urban	6,185	645	3,581	4,226	645	645	1,052	1,052	6,340	6,340	5,695				
	Rural	11,754		7,052	7,052		1,052	1,052	12,683	12,683	11,795	4,743	4,743			
	Total	17,939	645	10,633	11,278	645	2,104	2,104	25,366	25,366	23,135	9,486	9,486			
Capul	Urban	4,487		2,800	3,443				4,618	4,618	4,387					
	Rural	5,937		416	3,562	3,978			6,111	6,111	5,267	1,705	1,705			
	Total	10,424		3,216	7,421	3,978	3,978	416	416	10,729	10,729	10,070	4,387	4,387		
Cataman (Capital)	Urban	32,421	2,567	19,799	22,538				35,640	35,640	31,291					
	Rural	40,153	532	23,560	24,092				44,140	44,140	40,518	16,938	16,938			
	Total	72,574	3,099	43,359	46,630				79,780	79,780	74,908	31,291	31,291			
Cebuig	Urban	4,807	501	2,306	2,807	501	501		5,163	5,163	4,905	4,404	4,404			
	Rural	23,553		13,540	14,132				25,299	25,299	22,936	9,396	9,396			
	Total	28,360	501	15,846	16,939	501	501		30,462	30,462	28,433	13,800	13,800			
Gamay	Urban	2,876	300	1,426	1,726	300	300		3,183	3,183	3,024					
	Rural	20,318		12,191	12,191				22,489	22,489	20,915	8,724	8,724			
	Total	23,194	300	13,617	13,917	300	300		25,672	25,672	23,939	17,448	17,448			
Laonig	Urban	11,104		8,137	8,137				11,863	11,863	11,270					
	Rural	41,789		27,694	27,694				44,647	44,647	41,522	13,828	13,828			
	Total	52,893		35,831	35,831				56,510	56,510	52,792	27,660	27,660			
Laping	Urban	4,285	447	2,326	2,773	447	447		4,693	4,693	4,449	4,002	4,002			
	Rural	7,127		4,104	4,276				7,790	7,790	7,245	2,969	2,969			
	Total	11,412	447	6,430	7,049	447	447		12,483	12,483	11,694	7,001	7,001			
Las Navas	Urban	8,587	896	2,770	4,039	896	896		9,205	9,205	8,745	7,849	7,849			
	Rural	19,493		11,049	11,696				20,897	20,897	19,434	7,738	7,738			
	Total	28,080	896	13,819	15,735	896	896		30,102	30,102	28,179	15,587	15,587			
Lavejares	Urban	3,433		2,231	2,231				3,584	3,584	3,405					
	Rural	18,510		11,570	12,280				19,321	19,321	17,969	5,689	5,689			
	Total	21,943		13,761	14,511				22,905	22,905	21,374	6,094	6,094			
Lopez De Vega	Urban	3,057	319	346	621	319	319		3,433	3,433	3,201	2,942	2,942			
	Rural	11,615		6,118	6,969				13,046	13,046	12,133	5,104	5,104			
	Total	14,672	319	9,564	13,950	319	319		16,479	16,479	15,334	8,046	8,046			

In the determination of the number of households to be served by flush type toilet, when the number of households to be served in the target year is higher than in base year, the target coverage is applied with conditions. When the target coverage is higher than Level III water supply coverage, the latter coverage is adopted, while in the other case, the target coverage is applied. In cases where the target coverage is less than that in base year, the base year coverage is adopted.

For Phase I, any type of existing sanitary facilities both in urban and rural areas is to be utilized during Phase I period. For Phase II, water-sealed toilet facilities in Phase I both in urban and rural areas are to be utilized.

The projected number of served households at the end of the Phase I period is 66,404. Additional households to be served totaled to 13,643, of which 31% is urban households and 69% is rural households. While at the end of Phase II period, the number of served households are 130,130 with an additional households to be served at 64,305. Table 8.5.2 provides the number of households to be served by target year for urban and rural areas by municipality.

(2) School toilets

The service coverage or the number of public school students to be served is estimated by municipality for the years 2004 and 2010.

The future service coverage and additional number of students to be served are estimated using the number of students served in the base year, the number of students in target years and the provincial sector targets.

Additional number of students to be served by municipality is the shortfall of the number of students to be served in targets comparing with either that in base year or in Phase I (details are referred to Supporting Report). However, when the number of students to be served in target/s is less than or equal to the base year, no additional number of households to be served is considered.

The existing facilities are to be utilized during Phase I period, while the facilities in Phase I are to be utilized during Phase II period.

Table 8.5.2 Additional Number of Households to be Served by Target Year (Household Toilets)

Name of Municipality	Area	Phase I Coverage (2004)										Phase II Coverage (2010)									
		No. of Served Households					Add'l. No. of Households to be Served					No. of Served Households					Add'l. No. of Households to be Served				
		Flush	Pour	VIP/Dry	Total	Total	Flush	Pour	VIP/Dry	Total	Total	Flush	Pour	VIP/Dry	Total	Total	Flush	Pour	VIP/Dry	Total	
Rosario	Urban	363	247	26	247	26	672	315	670	315	68	385									
	Rural	1,442	937	282	937	282	2,291	2,062	2,062	1,125	1,125										
	Total	1,805	1,184	308	1,184	308	2,968	3,15	2,692	3,15	1,193	1,508									
San Antonio	Urban	168	103	11	103	11	223	103	207	93	842										
	Rural	1,637	1,064	150	1,064	150	2,118	1,906	1,906	842	842										
	Total	1,805	1,167	161	1,167	161	2,341	2,009	2,113	93	942										
San Isidro	Urban	585	358	40	358	40	868	403	807	364	45	409									
	Rural	4,474	2,908	1,049	2,908	1,049	6,532	5,985	6,149	3,077	3,241										
	Total	5,059	3,266	1,089	3,266	1,089	7,700	6,968	6,956	5,28	3,122										
San Jose	Urban	598	411	366	407	40	864	402	804	361	361										
	Rural	2,161	1,405	257	1,405	257	3,076	2,723	2,723	1,318	1,318										
	Total	2,759	1,812	33	1,812	33	3,980	3,125	3,527	3,011	1,554										
San Roque	Urban	1,476	904	100	904	90	2,003	1,211	1,210	106	106										
	Rural	2,228	1,456	1,456	1,456	1,456	3,703	3,333	3,333	1,877	1,877										
	Total	3,704	2,360	1,556	2,360	1,556	5,706	4,543	4,543	2,983	2,983										
San Vicente	Urban	341	209	23	209	23	411	191	382	168	168										
	Rural	984	640	273	640	273	1,053	1,047	1,047	407	407										
	Total	1,325	849	296	849	296	1,524	1,238	1,429	575	575										
Silvino Lobos	Urban	536	372	372	372	955	444	444	444	444	444										
	Rural	1,614	1,049	797	1,049	797	2,626	2,363	2,363	1,314	1,314										
	Total	2,150	1,421	1,169	1,421	1,169	3,381	2,807	3,251	444	1,386										
Victoria	Urban	536	371	7	371	150	750	349	698	342	342										
	Rural	2,240	1,456	807	1,456	807	3,019	2,717	2,717	1,261	1,261										
	Total	2,776	1,827	814	1,827	814	3,769	3,066	3,415	342	1,561										
Provincial Total	Urban	26,986	17,352	1,480	17,352	18,432	40,644	18,904	37,298	17,424	17,424										
	Rural	71,651	47,572	9,376	47,572	9,376	102,590	696	91,636	696	44,064										
	Total	98,637	64,924	10,856	64,924	10,856	143,234	19,600	130,130	18,120	46,188										

Table 8.5.2 Additional Number of Households to be Served by Target Year (Household Toilets)

Name of Municipality	Area	Total Households	Phase I Coverage (2004)						Phase II Coverage (2010)						
			No. of Served Households			Add'l. No. of Households to be Served			No. of Served Households			Add'l. No. of Households to be Served			
			Flush	VIP/Dry	Total	Flush	VIP/Dry	Total	Flush	VIP/Dry	Total	Flush	VIP/Dry	Total	
Allen	Urban	2,074	141	1,209	1,410	131	283	414	2,826	1,314	1,314	2,628	1,173	45	1,218
	Rural	2,091		1,359	1,359	95	95	95	2,427	2,427		2,427	1,113		1,113
	Total	4,165	141	2,608	2,769	131	378	509	5,253	3,741	3,741	5,100	2,286	45	2,331
Biri	Urban	430	31	275	306	27	148	175	208	329	329	658	298	54	352
	Rural	1,318		857	857	537	537	537	2,097	1,807	1,807	1,837	1,030		1,030
	Total	1,748	31	1,132	1,163	27	685	712	2,905	329	2,276	2,945	2,084	54	1,382
Bobon	Urban	1,183	80	724	804	75	305	380	1,669	776	776	1,552	696	52	748
	Rural	2,300		1,495	1,495	180	180	180	3,171	2,854	2,854	2,854	1,359		1,359
	Total	3,483	80	2,219	2,299	25	485	560	4,840	776	3,630	4,406	2,211	52	2,107
Capul	Urban	876	2	594	596	178	178	178	1,155	537	537	1,074	535		535
	Rural	1,644		744	744	196	196	196	1,528	1,375	1,375	1,375	631		631
	Total	2,020	2	1,338	1,340	374	374	374	2,683	1,912	1,912	2,449	535		535
Catamban (Capital)	Urban	5,571	379	3,409	3,788	344	58	402	8,910	4,143	4,143	8,286	3,764	754	4,498
	Rural	7,634		4,962	4,962	913	913	913	11,035	532	9,400	9,932	532	4,438	4,970
	Total	13,205	379	8,371	8,750	344	971	1,315	19,945	4,675	13,245	18,218	4,296	5,172	9,468
Cubug	Urban	914	10	786	796	796			1,291	601	601	1,291	591		591
	Rural	4,591		3,573	3,573				6,225	5,692	5,692	5,692	2,120		2,120
	Total	5,505	10	4,359	4,359	796	796	796	7,616	601	6,993	6,984	591	2,120	2,120
Gumay	Urban	3,968	38	3,411	3,411	33	93	126	766	370	370	740	332	39	361
	Rural	4,525		2,579	2,579	1,046	1,046	1,046	5,622	370	5,450	5,800	332	2,510	2,842
	Total	8,036	38	2,920	2,958	53	1,399	1,172	6,418	740	5,670	11,600	664	2,849	3,014
Laoang	Urban	8,036	17	5,555	5,555				11,162	601	10,046	10,046	4,693		4,693
	Rural	10,666		6,927	6,944				14,128	1,379	11,428	12,804	1,362	4,693	6,055
	Total	18,702	17	12,482	12,499				25,290	1,980	23,310	23,850	6,055	4,693	10,748
Lapinig	Urban	713	49	436	485	49	124	223	1,171	545	544	1,089	498	108	604
	Rural	1,239		895	895	405	378	378	1,948	1,745	1,745	1,745	948		948
	Total	1,952	49	1,241	1,280	49	549	549	2,948	1,745	2,297	2,834	1,446	108	1,552
Las Navas	Urban	1,611	110	985	1,095	107	316	437	2,101	1,070	1,070	2,140	960	83	1,043
	Rural	3,986		2,591	2,591	3	3	3	5,224	4,702	4,702	4,702	2,111		2,111
	Total	5,597	110	3,576	3,686	107	335	440	7,325	1,070	5,722	6,842	4,060	2,196	3,150
Lavezares	Urban	654	10	517	527				896	416	416	833	407		407
	Rural	3,739		2,702	2,702				4,830	4,347	4,347	4,347	1,045		1,045
	Total	4,393	10	3,219	3,229				5,726	417	4,763	5,189	1,492	1,045	2,052
Lopez De Vega	Urban	530	36	324	360	33	118	151	858	399	399	798	363	73	436
	Rural	1,910		1,262	1,262				426	3,262	2,936	2,936	1,694		1,694
	Total	2,440	36	1,586	1,602	33	544	577	4,120	3,000	3,335	3,734	2,663	73	2,707
Mapatag	Urban	516	35	316	351	35	168	168	773	360	359	719	325	43	366
	Rural	1,498		972	972				2,97	2,339	2,105	2,105	1,133		1,133
	Total	2,014	35	1,288	1,323	35	430	405	3,112	340	2,444	2,824	2,251	1,176	1,501
Mondragon	Urban	1,242	85	760	845	77	282	359	1,823	848	847	1,695	763	87	850
	Rural	4,421		2,874	2,874				3,684	8,104	6,509	7,348	2,631	2,860	3,629
	Total	5,663	85	3,634	3,719	77	1,464	1,223	8,104	848	6,509	9,003	2,860	2,779	3,629
Palapag	Urban	1,428	97	874	971	92	144	144	6,151	892	5,716	5,716	2,807		2,807
	Rural	4,475		2,909	2,909				2,361	892	5,716	7,501	2,807		2,807
	Total	5,903	97	3,783	3,880	92	144	236	8,270	892	6,608	13,217	5,614	2,807	5,614
Pambujan	Urban	2,024	138	1,238	1,376	129	485	614	3,231	1,503	1,503	3,005	1,365	204	3,209
	Rural	2,523		1,640	1,640				685	3,890	3,501	3,501	1,861		1,861
	Total	4,547	138	2,878	3,016	129	1,170	1,299	4,116	2,103	5,003	6,506	3,226	2,125	5,090

The projected number of served students at the end of Phase I period is 62,568. The additional students to be served are 25,497. While at the end of Phase II period, the projected number of served students are 125,783 with an additional students to be served at 63,239.

Table 8.5.3 summarizes the number of public school students to be served by target year.

Table 8.5.3 Additional Number of Public School Student to be Served by Target Year (School Toilets)

Name of Municipality	Phase I Coverage (2004)			Phase II Coverage (2010)		
	Total No. of Public School Student	Std. No. of School Students to be Served	Add'l. No. of Public School Student to be Served	Total No. of Public School Student	Std. No. of Public School Students to be Served	Add'l. No. of Public School Student to be Served
Allen	4,647	1,572	1,012	5,036	4,532	2,960
Biri	2,593	1,245	565	2,996	2,696	1,451
Bobon	4,434	2,806	966	4,519	4,067	1,261
Capul	2,805	1,851	611	2,887	2,598	747
Cataman (Capital)	17,789	6,035	3,875	19,555	17,600	11,565
Catubig	6,698	4,099	1,459	7,618	6,856	2,757
Gamay	6,508	4,538	1,418	6,843	6,159	1,621
Laoang	11,032	6,003	2,403	13,358	12,022	6,019
Lapinig	3,300	1,119	719	3,607	3,246	2,127
Las Navas	6,283	2,809	1,369	7,157	6,441	3,632
Lavezares	5,687	2,639	1,239	5,936	5,342	2,703
Lope De Vega	2,794	1,689	609	3,363	3,027	1,338
Mapanas	2,963	1,165	645	3,468	3,121	1,956
Mondragon	5,765	2,456	1,256	6,721	6,049	3,593
Palapag	8,087	2,721	1,761	8,966	8,069	5,348
Pambujan	7,006	3,686	1,526	7,687	6,918	3,232
Rosario	2,927	2,391		3,285	2,957	566
San Antonio	2,108	1,259	459	2,128	1,915	656
San Isidro	6,539	4,224	1,424	7,679	6,911	2,687
San Jose	3,623	1,840		3,924	3,532	1,692
San Roque	4,481	2,456	976	5,411	4,870	2,414
San Vicente	1,530	1,360		1,484	1,336	
Silvino Lobos	1,994	1,114	434	2,395	2,156	1,042
Victoria	3,540	1,491	771	3,737	3,363	1,872
Provincial Total	125,133	62,568	25,497	139,760	125,783	63,239

(3) Public toilets

The service coverage of public utilities with sanitary toilet facility by municipality is estimated for the years 2004 and 2010.

The future service coverage and additional coverage are estimated using the existing number of public utilities with sanitary toilets in the base year, the number of public utilities in target years, and provincial sector targets.

The additional number of public utilities with sanitary toilets needed by municipality is the shortfall of the number of public utilities in target year comparing with either the existing coverage or Phase I coverage (details are referred to Supporting Report).

The existing sanitary facilities are to be utilized during Phase I period. The facilities in Phase I are to be utilized during Phase II period.

The number of served public utilities at the end of Phase I period is 24. The additional public utilities to be served are 6. While at the end of Phase II period, the number of served public utilities are 36 with an additional public utilities to be served at 12. Table 8.5.4 summarizes the additional number of public utilities to be served by municipality by target year.

Table 8.5.4 Additional Number of Public Utilities with Sanitary Toilets by Target Year

Name of Municipality	Type	Phase I Coverage (2004)		Phase II Coverage (2010)	
		Add'l. No. of Public Utility with Sanitary Toilets	No. of Public Utility with Sanitary Toilets	Add'l. No. of Public Utility with Sanitary Toilets	No. of Public Utilities with Sanitary Toilets
Allen	Public Market				
	Bus/Jeepney Terminal	1	1		1
	Parks/Playground				
	Total	1	1		1
Biri	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total		1		1
Bobon	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Capul	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				1
	Total		1		1
Catarman (Capital)	Public Market				
	Bus/Jeepney Terminal	1	1		1
	Parks/Playground				
	Total	1	1		1
Catubig	Public Market				1
	Bus/Jeepney Terminal	1	1		1
	Parks/Playground		2		2
	Total	1	4		4

Table 8.5.4 Additional Number of Public Utilities with Sanitary Toilets by Target Year

(Cont'd)

Name of Municipality	Type	Phase I Coverage (2004)		Phase II Coverage (2010)	
		Add'l. No. of Public Utility with Sanitary Toilets	No. of Public Utility with Sanitary Toilets	Add'l. No. of Public Utility with Sanitary Toilets	No. of Public Utilities with Sanitary Toilets
Ganay	Public Market		1		1
	Bus/Jeepney Terminal			1	1
	Parks/Playground		2		2
	Total		3	1	4
Laoang	Public Market				
	Bus/Jeepney Terminal			1	1
	Parks/Playground				
	Total			1	1
Lapinig	Public Market	2	2		2
	Bus/Jeepney Terminal			1	1
	Parks/Playground				
	Total	2	2	1	3
Las Navas	Public Market	1	1		1
	Bus/Jeepney Terminal				
	Parks/Playground			1	1
	Total	1	1	1	2
Lavezares	Public Market		1		1
	Bus/Jeepney Terminal				
	Parks/Playground		1		1
	Total		2		2
Lope De Vega	Public Market		1		1
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total		1		1
Mapanas	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground			1	1
	Total			1	1
Mondragon	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground			1	1
	Total			1	1
Palapag	Public Market				
	Bus/Jeepney Terminal			1	1
	Parks/Playground		1		1
	Total		1	1	2
Pambujan	Public Market		1		1
	Bus/Jeepney Terminal				
	Parks/Playground		2		2
	Total		3		3
Rosario	Public Market			1	1
	Bus/Jeepney Terminal				
	Parks/Playground			1	1
	Total			2	2
San Antonio	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
San Isidro	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground			1	1
	Total			1	1
San Jose	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground		1		1
	Total		1		1

Table 8.5.4 Additional Number of Public Utilities with Sanitary Toilets by Target Year

(Cont'd)

Name of Municipality	Type	Phase I Coverage (2004)		Phase II Coverage (2010)	
		Add'l. No. of Public Utility with Sanitary Toilets	No. of Public Utility with Sanitary Toilets	Add'l. No. of Public Utility with Sanitary Toilets	No. of Public Utilities with Sanitary Toilets
San Roque	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
San Vicente	Public Market			1	1
	Bus/Jeepney Terminal				
	Parks/Playground			1	1
	Total			2	2
Silvino Lobos	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground		1		1
	Total		1		1
Victoria	Public Market		1		1
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total		1		1
Provincial Total	Public Market	3	10	2	12
	Bus/Jeepney Terminal	3	3	4	7
	Parks/Playground		11	6	17
	Total	6	24	12	36

8.5.3 Urban Sewerage

The service coverage in 2010 (Phase II) is estimated for the municipalities with population of more than 10,000 in urban area provided by Level III water supply. It is assumed that half of the population in the area/s is to be served by the sewerage systems. Table 8.5.5 shows the population to be served in Phase II.

8.5.4 Solid Waste

Future requirements in the sub-sector are studied giving priority to urban area for the Phase I. Staged improvement for the rural area shall be studied in the future.

Service coverage in Phase I was assumed at 65% with reference to the present service coverage of 56% in urban area.. Additional service coverage in Phase I is calculated as a shortfall of target coverage in Phase I comparing with current service coverage. Table 8.5.6 presents additional service coverage for Phase I in the urban area.

Table 8.5.5 Population to be Served by Urban Sewerage in Phase II

Name of Municipality	Urban Population in 2010	Level III Water Supply Coverage	Population to be Served
Allen	11,305	10,740	5,653
Cataman (Capital)	35,610	33,858	17,820
Laoang	11,863	11,270	5,932
Pambujan	12,925	12,279	6,463
San Roque	10,413	9,892	5,207
Provincial Total	162,565	154,437	41,075

Table 8.5.6 Additional Number of Urban Households to be Served by Municipal Solid Waste System in Phase I

Name of Municipality	No. of Urban Households Served in the Base Year	Phase I Coverage (2004)		
		No. of Urban Households	Urban Households Coverage	Add'l. No. of Urban Households to be Served
Allen		2,074	1,349	1,349
Biri		450	293	293
Bobon		1,183	769	769
Capul		876	570	570
Cataman (Capital)	5,788	5,571	5,788	
Catubig		914	595	595
Gamay		557	363	363
Laoang	2,099	2,030	2,099	
Lapinig		713	464	464
Las Navas		1,611	1,048	1,048
Lavezares	804	654	804	
Lope De Vega		530	345	345
Mapanas		516	336	336
Mondragon	1,346	1,242	1,346	
Patapag	1,541	1,428	1,541	
Pambujan	1,541	2,024	1,541	
Rosario	556	363	556	
San Antonio		268	110	110
San Isidro		585	381	381
San Jose		598	389	389
San Roque		1,476	960	960
San Vicente		341	222	222
Silvino Lobos		536	349	349
Victoria		556	362	362
Provincial Total	13,675	26,996	22,580	8,905

8.6 Facilities, Equipment and Rehabilitation to Meet the Target Services

8.6.1 Water Supply

(1) Required facilities

Water supply facilities required by service level were estimated by urban and rural area by municipality based on the additional service coverage by target year and summarized in Table 8.6.1 (details are referred to the Supporting Report).

Urban water supply:

Physical requirements of Level III systems were estimated as the number of required house connections. The mode of project indicates whether future urban water supply will be implemented as expansion of existing system or construction of a new system. The number of water sources was also estimated based on the water source evaluation results in Chapter 7.

Rural water supply:

Physical requirements of Level II systems were estimated as the number of systems and number of communal faucets, while that of Level I facilities were first estimated as the number of wells with classification of deep and shallow wells. Deep wells were further subdivided in terms of three different standard depths based on the water source evaluation results.

Furthermore, as for Level I facilities, in this PW4SP, 50% of the total required facilities will be implemented by public (LGUs) and 25% of these public Level I facilities will be allocated to spring development.

(2) Rehabilitation

Rehabilitation requirements were estimated as 10% of the total number of deep wells to be constructed under PW4SP. Rehabilitation work will be mainly redevelopment of wells by means of air surging, while minor repair of concrete apron and hand-pump will be undertaken by respective beneficiary organizations.

(3) Equipment

Logistic support:

For rural water supply development, 1 unit each or set of the following equipment was considered necessary for the provincial government to conduct various activities of PW4SP implementation:

Table 8.6.1 Water Supply Facilities Required by Target Year

Name of Municipality	Phase I (2004) Requirements										Phase I (2010) Requirements											
	Urban Water Supply (Level III)					Rural Water Supply					Urban WS (Level III)					Rural Water Supply						
	Mode of Project	No. of Add'l. Water Source	No. of HHS Connection	Level II		Level I			No. of Add'l. Water Source	Total No. of Wells	No. of Shallow Wells	No. of HHS Connection	Level I			No. of Shallow Wells	Total No. of Wells					
				No. of System	No. of Communal Faucets	40 m	80 m	120 m					Sub-total	40 m	80 m			120 m	Sub-total			
Allen	New	1	216							12	12	2	2,413						69	69		
Biri	New	1	47							8	8	1	605						54	54		
Bobon	New	1	123							14	14	1	1,424						80	80		
Capul	N/A											1	1,097						29	29		
Catarman (Capital)	N/A									46	46	5	7,823						283	283		
Caulbig	New	1	95							27	27	1	1,101						157	157		
Gamay	New	1	58							22	22	1	681						132	132		
Laoang	N/A											2	2,818						231	231		
Lapinig	New	1	74							7	7	1	1,001						50	50		
Las Navas	New	1	168							24	24	2	1,962						129	129		
Lavezans	N/A											1	851						48	48		
Lope De Vega	New	1	55							11	11	1	736						87	87		
Mapanas	New	1	54							9	9	1	662						55	55		
Mondragon	New	1	130									1	1,558						121	121		
Palaog	New	1	149							27	27	1	1,643						165	165		
Pambujan	New	1	211							15	15	2	2,763						100	100		
Rosario	N/A											1	643						48	48		
San Antonio	New	1	17									1	190							43		
San Isidro	N/A											1	597						15	15		
San Jose	New	1	62							11	11	1	737						61	61		
San Roque	New	1	154							13	13	2	2,232						146	146		
San Vicente	New	1	36									1	349							11		
Silvino Lobos	New	1	56							10	10	1	816						68	68		
Victoria	N/A									6	6	1	713						32	32		
Provincial Total		17	1,705							170	72	33	35,415					1,336	441	1,777	708	2,486
EXP-0																						
New-17																						

Transportation- service vehicle
Office equipment- computer with printer, typewriter, mimeo machine, scanning machine and copier
Field equipment- sound system, tape recorder and tools for maintenance

For urban water supply, no hardware was considered.

Well drilling and rehabilitation equipment:

As a reference information, necessary types and number of well drilling and rehabilitation equipment were studied considering the existing equipment of sector agencies in the province.

During Phase I, a total of 92 Level I deep wells shall be newly constructed by public (LGUs) and 10% of these deep wells shall be rehabilitated annually (details are referred to Supporting Report). Presently, neither the provincial government nor the DEO-DPWII has available drilling rig at present.

Therefore, a total of 2 sets of drilling rigs (medium size percussion type) together with 1 set of well rehabilitation equipment, 1 unit of support vehicle for well rehabilitation and 2 units of service truck for deep well construction shall be mobilized/procured either by the private sector or the LGUs (details are referred to the Supporting Report).

Selection of well drilling machine

An appropriate type of well drilling machine with its specifications shall be selected after comprehensive study on the technical requirements, local capability in O&M of the machine and cost effectiveness.

From the technical viewpoint, geological conditions in the province allow for the use of either rotary or percussion type drilling machine (no rock drilling is expected). While, in view of economical and O&M experience on the machine in the local area, a percussion type is recommendable. Although, the rotary type machine is quite effective to reduce construction period under soft soil condition, special training on mud-circulation, handling manner, etc. are required together with additional equipment and materials as compared with percussion type. The drilling speed of the percussion type is rather slow, but has advantages in drilling boulder and cobble formations.

One unit of truck mounted percussion drilling machine was considered to be procured in the long-term development period.

(4) Laboratory

Instrument/Equipment and Other Laboratory Accessory:

The provincial government will need at least 3 sets of instruments/equipment in order to ensure regular water quality monitoring and surveillance activities for the entire province. The distribution would be in 3 strategic municipalities where provincial/municipal hospitals are located. These are in the hospitals of Catarman, Allen and Laoang. Water samples have to be examined on time to avoid unpredictable changes of the quality due to long storage.

The laboratory equipment requirement for Catarman hospital is designed to upgrade the existing facility so as to efficiently cover the municipalities of San Roque, Mondragon, Lope de Vega, Bobon, San Jose, Biri, Rosario and Silvino Lobos. The 2 new laboratories will cover the following municipalities:

- Allen hospital - Lavezares, Victoria, San Isidro, San Antonio, Capul and San Vicente
- Laoang hospital - Lapinig, Gamay, Mapanas, Palapag, Catubig, Las Navas and Pam-bujan.

The following are the requirements:

Item	Unit	Upgrading of		
		Catarman Laboratory	Allen	Laoang
1. Instrument/Equipment				
Turbidity meter	set	1	1	1
Color meter	set	1	1	1
pH/Residual chlorine checker	set	1	1	1
Incubator	set	1	1	1
Refrigerator	set	1	1	1
Sterilizer	set	1	1	1
Portable water quality testing kit	set	1	1	1
Electric stove	set	1	1	1
Range hood	set	1	1	1
2. Glassware/Chemical	set	1	1	1
3. Accessory				
Sink	set	1	1	1
Working table	set	1	1	1
Shelf	set	1	1	1
Office desk	set	1	1	1
Chair	set	1	1	1

8.6.2 Sanitation

This sub-section refers to physical requirements by target year covering household, school and public toilet facilities. Table 8.6.2 presents the required sanitation facilities by target year. Rehabilitation for the sanitation facilities is considered as part of recurrent cost.

(1) Household toilets

Future requirements in the number of household toilets by different type for urban and rural areas were estimated based on additional households to be served by type of facility both for urban and rural areas by target year (details are referred to Supporting Report).

(2) School toilets

The future requirements in the number of toilet facilities were estimated based on the standard number of students to be served by a 5-unit standard facility or a toilet in every classroom (50-50 sharing) and the additional students to be served by target year (details are referred to Supporting Report).

Total required facilities were further broken down into urban and rural areas by applying the percentage share of urban and rural population.

(3) Public toilets

Future requirements in the number of toilet facilities were estimated based on the additional number of toilets for public markets and bus/jepney terminals located in urban areas (details are referred to Supporting Report).

8.6.3 Urban Sewerage and Solid Waste

Physical requirements for the sewerage facilities are not discussed in this sub-section. Further study shall be conducted in the future.

As reference information, the number of refuse collection trucks is estimated for the urban area in Phase I. Seventeen (17) additional units of truck are required to meet assumed service coverage as reflected in Table 8.6.3.

Table 8.6.2 Sanitation Facilities Required by Target Year

Name of Municipality	Phase I (2024) Requirements												Phase II (2025) Requirements														
	Urban Sanitation						Rural Sanitation						Urban Sanitation						Rural Sanitation								
	No. of Households			No. of Public Toilets			No. of Households			No. of Public Toilets			No. of Households			No. of Public Toilets			No. of Households			No. of Public Toilets					
	Flush	Pour Flush	VIP/ Dry	Total	Public Market	Bus/ Jeepney Terminal	Parks/ Playground	Flush	Pour Flush	VIP/ Dry	Total	Public Sch.	Public Market	Bus/ Jeepney Terminal	Parks/ Playground	Flush	Pour Flush	VIP/ Dry	Total	Public Sch.	Public Market	Bus/ Jeepney Terminal	Parks/ Playground	Flush	Pour Flush	VIP/ Dry	Total
Allen	131	283		414	3	1		95	1,173	45	1,218	3						1,121								1,121	11
Bato	27	148		175			337	298	34	352	2							1,030								1,030	10
Bobon	35	305		389	2		180	688	32	748	2							1,339								1,339	13
Caruli		176		176	1		186	335		513	2							431								431	7
Canaman (Capital)	344	56		402	0		913	3,764	714	4,998	26							532								4,938	44
Canibug							1,046	332	29	1,362	6							2,481								2,481	27
Camuy	33	93		126			375	486	108	664	4							948								948	10
Lacang	49	174		223	1		3	960	95	1,043	6							2,111								2,111	22
Ligang	107	310		417	2			407		407	2							1,644								1,644	12
Layres							426	363	75	438	1							1,133								1,133	12
Layte De Vego	33	118		151			297	325	43	368	2							2,776								2,776	23
Mapahu	35	131		168			364	363	87	450	4							2,807								2,807	31
Mondragon	77	282		359	1		144	796	18	916	6							1,861								1,861	19
Muling	92			92	2		655	264		919	7							1,125								1,125	11
Muntin	129	485		614	3		232	315	68	383	1							362								362	6
Osorno	11	26		36			150	93		93								164								164	4
San Antonio							1,049	264	45	1,362	2							3,091								3,091	31
San Andres	35	180		215			257	361	36	397	2							1,318								1,318	14
San Jose	33	7		40			1,111	306		1,417	5							1,877								1,877	14
San Roque	90			90	2		273	163		436	1							407								407	5
San Vicente	23	73		96			797	444	79	1,244	1							1,314								1,314	8
Santo Lobo							807	342		1,149	2							1,261								1,261	13
Victoria	150			150			9,316	17,424	2,121	19,443	93							44,064								44,064	449
Provincial Total	1,334	5,943		4,297	29	3	9,316	17,424	2,121	19,443	93							44,064								44,064	449

Table 8.6.3 Number of Refuse Collection Trucks Required in Phase I

Name of Municipality	Additional Urban Households to be Served	Estimated Daily Amount of Refuse to be Generated, (Kg)	Number of Collection Truck Required
Allen	1,349	564	1
Biri	293	123	1
Bobon	769	322	1
Capul	570	239	1
Cataman (Capital)			
Catubig	595	249	1
Gamay	363	152	1
Laoang			
Lapinig	164	194	1
Las Navas	1,048	439	1
Lavezares			
Lope De Vega	345	145	1
Mapanas	336	141	1
Mondragon			
Palapag			
Pambujan			
Rosario			
San Antonio	110	46	1
San Isidro	381	160	1
San Jose	389	163	1
San Roque	960	402	1
San Vicente	222	93	1
Silvino Lobos	349	146	1
Victoria	362	152	1
Provincial Total	8,905	3,730	17

8.7 Identification of Priority Projects for Medium-Term Development Plan

In general, the present service coverage by municipality with reference to the target coverage indicates the direction of development effort for implementing PW4SP with municipal priorities.

Specific projects shall be selected subject to detailed studies and will not be discussed in the provincial master plan. In addition, pertinent information to identify priority projects is not available both at provincial and municipal level during this PW4SP preparation, except some future expansion work for WIDs.

The general criteria for identifying priority projects as guide for implementing the PW4SP are summarized below.

The first level of priority should be given to projects with positive feasibility studies and identified funding. Next level of priority should be given to projects with positive feasibility studies, although no funding source has been identified. The third level should be for which

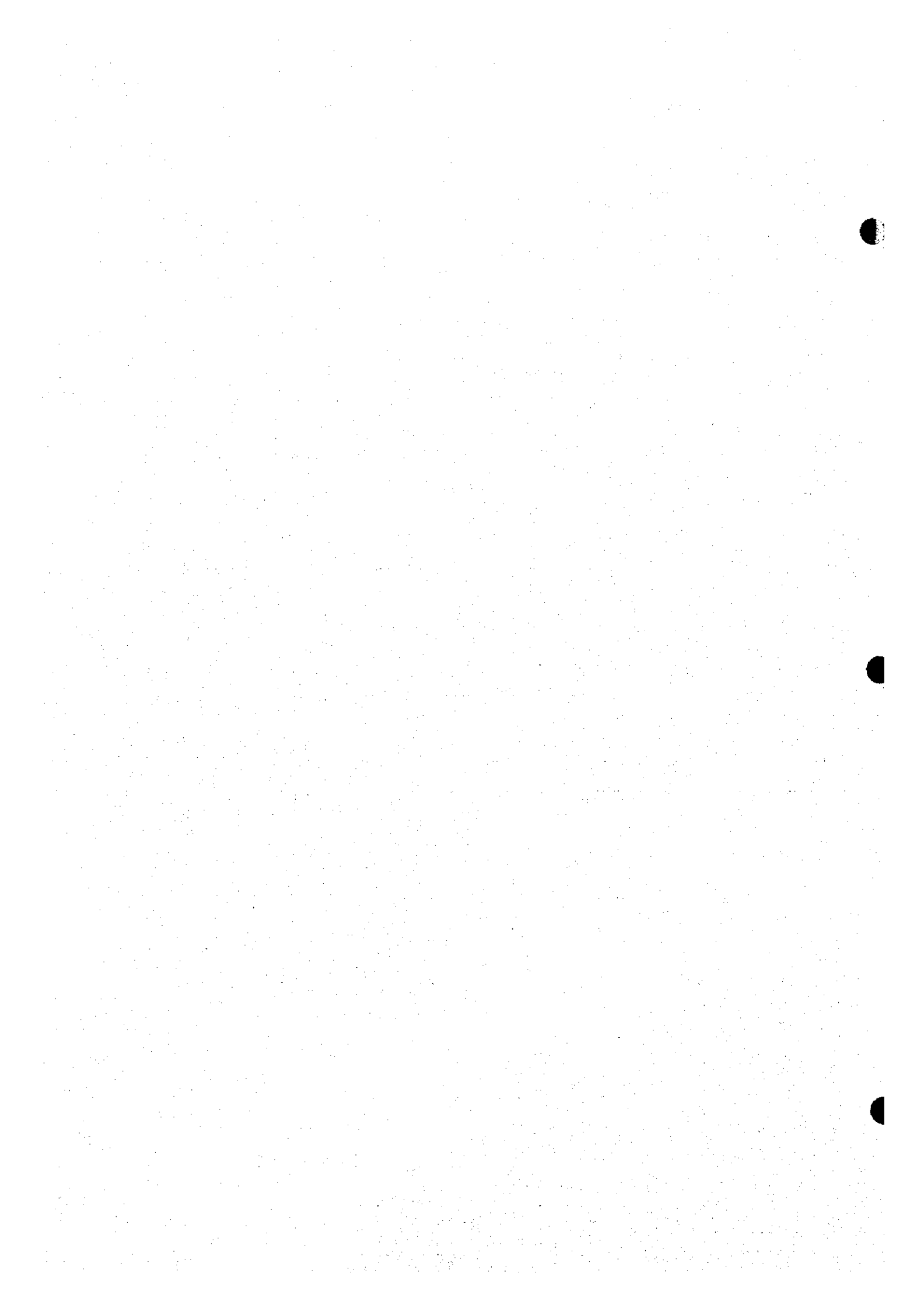
feasibility study has been conducted. Within each level, if funds were insufficient, a ranking could be carried out applying some factors, such as willingness to pay, water-related diseases status and per capita cost. Under the above-mentioned conditions, the implementors should prepare a list of projects.

Due attention shall be paid on the importance of integrated development of relevant sub-sectors to maximize the effects and benefits through simultaneous implementation of water supply and sanitation projects. On a municipal level priority, synthetic evaluation of sector components for concerned municipalities (which is studied in the financial arrangements, Chapter 11) may be used for implementation arrangements.

Chapter

9

**SECTOR MANAGEMENT FOR
MEDIUM-TERM DEVELOPMENT**



9. Sector Management for Medium-Term Development

9.1 General

In order to manage the water and sanitation sector effectively, the provincial and municipal governments of Northern Samar will have to make some adjustments in their current policies and structures.

9.1.1 Purpose of Policy and Structural Adjustment

The adjustments should be aimed at coordinating these local policies and structures more closely with the overall policies, institutional and regulatory frameworks, and resource-sharing systems of the water sector, so that the Province and its municipalities would be in the best position to realize available opportunities to improve water services, specifically:

- (1) to effect immediate improvements in the physical infrastructure for water, sanitation, and related environmental services; and
- (2) to acquire permanent capabilities to (a) plan, manage and institutionalize gains in sector services, (b) to nurture constructive partnerships with the private sector, and (c) to set in place and maintain the mechanisms for sustainability.

To the extent that additional resources are provided by programs like the World Bank-assisted LGU Urban Water and Sanitation Sector Project; and to the extent that the national government has instituted facilitative mechanisms to improve the sector, the provincial and municipal governments must seize the opportunities that, for the present, are available in order to achieve and expand current sectoral targets, and to ensure the long-term sustainability of sectoral gains.

9.1.2 Perspectives

In making the needed adjustments, the LGUs will do well to keep the following realities in clear perspective:

- (1) That the nature of public accountability dictates certain rigidities and procedural constraints in all governmental systems. Thus, while government must fulfill its mandate as the necessary and enabling institution for the provision of basic services, it is not the most responsive, efficient, and cost-effective agent for directly implementing these services. For this reason, local governments must clearly define their role in the investment, operation, and maintenance of water service utilities;

- (2) That the public -- and even many local officials -- still lack a deep realization of the importance of institutionalizing water services. This lack of realization reflects the transitional stage of most of Philippine society, to which the pervasive effects of urbanization (effects that extend even to the rural areas) and their demands on social participation in sustaining basic services are very recent and unfamiliar experiences. For this reason, the sector's social marketing endeavor must include a primary thrust of helping the community and all LGU officials understand the fundamental role of safe water and sanitation in the actualization of their most cherished of aspirations -- that is, to secure a better future for their children.
- (3) That large sectors in many communities, as well as some entire communities, do not have the capacity to shoulder the full cost of institutionalized water and sanitation services. LGUs are especially challenged to devise ways and means to ensure their disadvantaged constituents basic access to safe water and related services -- even as they seek fair participation from those who can afford to pay, and as they continue to exert efforts to establish these services on a permanent, self-sustaining basis.

This Chapter proposes the mechanisms, processes and structures needed in the medium-term to achieve the coverage targets with sustainability. Not all recommendations can be laid out with the same level of detail at this time as some are dependent on further policy guidelines being formulated at the national level. These include the on-going study on access of LGUs to external financing assistance and the sector devolution process.

9.2 Sector Management

9.2.1 Development of the Vision

One glaring institutional need at the local level is a common vision that could focus and mobilize the water sector's resources and the efforts of the different shareholders within a practical structure that delivers the desired services effectively in a sustainable manner. Such a common, shared vision can only be achieved if all the share shareholders realize the importance of managing water as a basic economic commodity and place value on their family's access to safe water within the framework of their own needs and aspiration.

Both the policy makers and the officials at all levels of governance and public service and a critical mass of the consumers themselves must internalize and share in the vision so that their efforts and resources could be mobilized for project implementation. Local planners need to focus on the long-term requirements i.e., beyond the technical requirements of forming users' associations, drilling wells, distributing bowls, etc. They need to work as "change agents" to

prepare themselves and their constituents to participate in ensuring that basic services like water and sanitation become available and are placed on a sustainable basis in their respective communities. With these considerations, and based on a realistic assessment of constraints, opportunities and demand, the province has set its vision and mission for the sector.

Initial vision statement: The province will adopt a two-phased plan, which seeks to dramatically improve the provision of water supply and sanitation. In the medium-term (2000-2004) plan, the province manages to maintain present service level; water supply coverage in urban areas 65% and in rural areas at 60%. On the other hand, household toilets will be made available to 68% of the urban population and 65% of the rural population; 50% of the students in public schools will have adequate sanitary toilet facilities; 100% of public utilities will have sanitary toilets; and 65% of the urban population will be covered by solid waste collection services. For its long-term (2005-2010) plan, the province will pursue a more vigorous program to increase water supply coverage in urban areas to 95% and in rural areas to 93%. For the sanitation sub-sector, individual household toilets will increase up to 93% in urban areas and 90% in rural areas; public school toilets will rise up to 90%; public utilities will have 100% sanitary toilet coverage; while sewerage service will cover 50% of the urban population.

9.2.2 Sector Management

A Sector Management Model is presented in Figure 9.2.1 for sector management and project development. It is envisaged that this PW4SP will be used as a basis for the Annual Sector Plan and/or as input into Loan or Grant Negotiations in the future. The Annual Sector Plan, together with the budgets, will be reviewed by the Governor and passed upon by the legislature as part of the provincial budget approval process.

The sector level implementation activities consist principally of three broad areas: social marketing, technical assistance, and monitoring. Project selection follows on from a self-selection process that includes the identification of a responsible community-based association and the preparation of technical studies, as needed. Construction or rehabilitation will take place only after the institutional, financial and technical studies have been done. Operation and maintenance, including arrangements for finances of the system, will be the responsibility of the community organization. The Monitoring Function, on the other hand, will be implemented as a sectoral program, augmented with water quality surveillance by the Provincial Health Office (PHO) and operational audits done by the LGU.

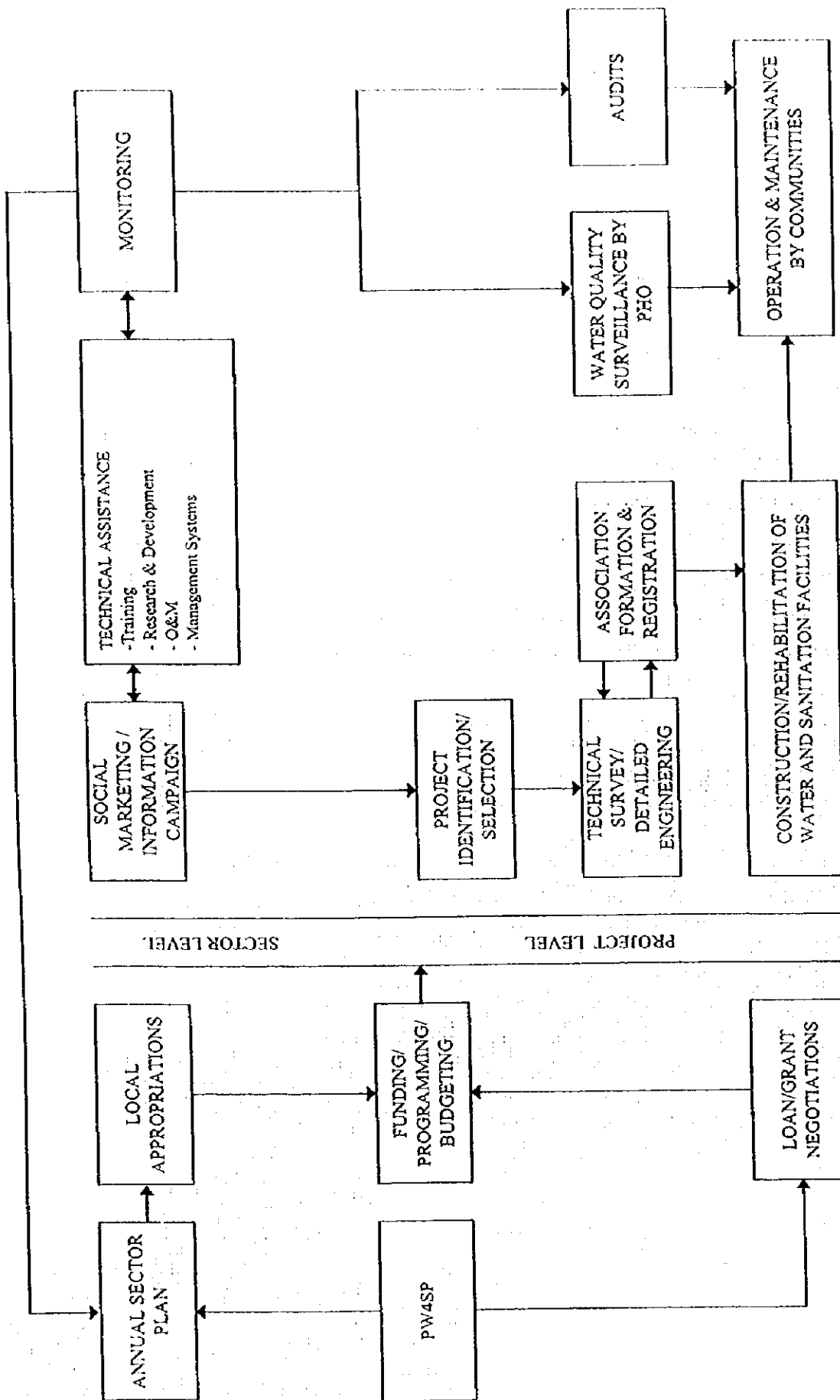


Figure 9.2.1 Sector Management Model

9.2.3 Service Provision Policies and Objectives

The LGU seeks to provide an adequate level of water and sanitation facilities defined as follows:

- Level I facilities serve at most 15 (fifteen) households per source; Level II public taps serve 5 (five) households per faucet; and Level III systems provide individual household connections.
- Water supply provision will be at least 20 lpcd for Level I; 60 lpcd for Level II; and 100 lpcd for Level III.
- A critical mass of 90% of the individual households in every barangay has sanitary toilet facilities.
- All schools shall have adequate water supply and at least one sanitary toilet facility for every 40 students.

9.2.4 Operating Policies

The following policy and strategy statements are adopted by the Provincial Government. These may be reviewed and revised from time to time by the Provincial Government. The key policy statements include the following:

- (1) Sustainability shall be promoted through increased community responsibility for management of facilities. Unless potential users demonstrate initiative and commitment (beyond making the request for assistance) to maintain the systems, no support shall be provided by the LGUs. To the extent possible, the LGUs should utilize existing local resources (self-reliance).
- (2) Selection and prioritization of projects shall be based on demonstrated commitment of the beneficiaries to participate in the project and their willingness to pay; the current water, sanitation and overall health conditions; potentials for growth; and cost implications.
- (3) Technology to be used for the projects shall be appropriate to local conditions and resources. While economical facilities should be the objective of design and selection, construction costs should not compromise quality, reliability, and provisions for future upgrading and expansion. Phased upward integration and future upgrading of systems and facilities shall also be promoted utilizing to the extent possible previously constructed facilities. In urban centers, a range of technologies may be adopted for wastewater collection and treatment, as well as for drainage.

- (4) An integrated approach to the provision of potable water supply, sanitation and hygiene education shall be promoted. All projects to be developed by the LGU must involve these three elements.
- (5) As part of the overall social marketing efforts for the sector, the Province shall implement an "Information, Education and Communication Program" with the primary thrust of promoting safe water and sanitation values. A nationwide IEC Program to Create "Safe Water" Value among communities is described in the Supporting Report. At the provincial level, the IEC Program shall start with the orientation of all local government officials down to the barangay level, and be coordinated with and draw the participation of other agencies, NGOs, and civic groups throughout the province, particularly those involved in community development, social projects, and health and education services. The program shall include, among others, a component to train individuals selected from the LGUs, participating agencies and organizations, and volunteers from the communities themselves as communicators/change agents for safe water values. Figure 9.2.2 shows the schematic design of the IEC Program.

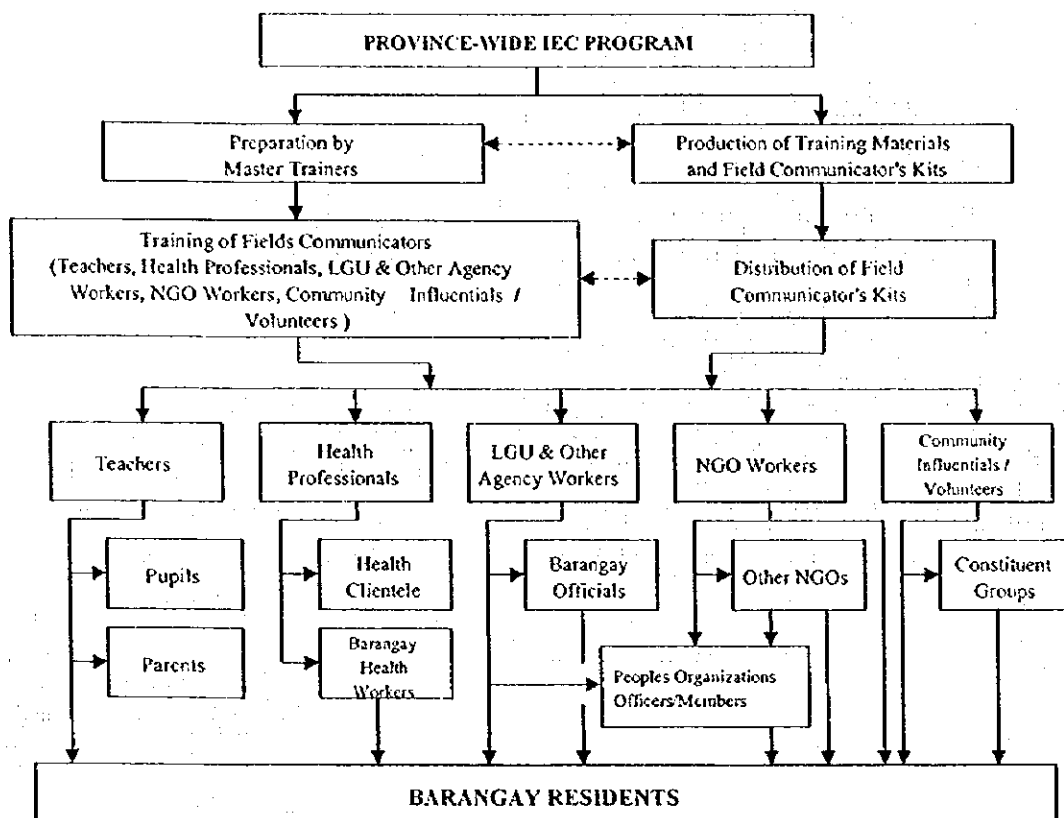


Figure 9.2.2 IEC Program Implementation Flow (Provincial Level)

- (6) The LGU shall seek, to the extent possible, to provide water and sanitation services equally to all their constituents, whether they reside in rural or urban areas, or in wealthy or depressed areas.
- (7) **Cost Recovery and Cost Sharing (Subsidy Policies):** The LGU shall enforce a rational and consistent policy on the application of subsidies and loans for water supply and sanitation. In May 1996, the Investment Coordination Committee (ICC) of the NEDA adopted a policy "to support the financing of devolved activities with social and/or environmental objectives" based on three considerations namely: Equity, Externalities and Economics of Scale. Accordingly, NEDA advised DILG of the revised cost-sharing arrangement which clearly limited the national government subsidy to Level I water supply systems for 5th and 6th class municipalities up to a maximum 50% of the total project cost. No subsidy from GOP is provided for Level II and III. For sanitation facilities, the national government subsidy for the 3rd to 6th class municipalities shall be from 50% to 70% of the total project cost.
- (8) **Private Sector Participation:** The government shall give the private sector a substantial and preferential role in the attainment of the PW4SP objectives. In harnessing their participation, less government intervention shall be exercised in areas where the private sector is or can be a key player. An environment designed to empower them to absorb new social responsibilities and proactively convey to the government their aspirations and interests shall be established. The formation of private sector groups, NGOs, community organizations, cooperatives and people's organizations shall be encouraged. The implementation of programs to develop their capabilities in the sector development programs shall be promoted.
- (9) The province's fiscal management, in terms of capital funds generation capability, budget and disbursement, shall be improved. The assistance of the legislative branch in the enactment of the proposed revenue-generating measures shall be sought. Financing through the private sector will also be encouraged.
- (10) Sector development shall be consistent with broader concerns for environmental protection and management. Pollution control, conservation and proper utilization of water and land resources are critical issues to be considered in development plans at all levels, including municipal land use plans. Among the specific concerns in relation to water resources that the LGUs shall address through a proactive, environmentally responsive management approach to resource use, are the preservation and enhancement

of watersheds, the prevention of pollution of streams and groundwater resources, and the protection of riverbanks and natural hydro-geological formations.

- (11) Disaster Response and Emergency Coordination: The LGU shall formulate, as part of its contingency plans, a program to address emergency conditions. The program shall include maintenance of stocks of chlorine, organization and training of local communities on restoration of water supplies, and provision of emergency sanitary facilities. The LGU should coordinate closely and regularly with the local officials of the Regional Disaster Coordinating Council (RDCC).

9.2.5 Regulatory Policies

In coordination with appropriate national and local agencies, the LGU shall endeavor to set up an effective regulatory framework considering the following:

- (1) Water allocation and water rights policies (conflict resolution) which are within the mandate of the National Water Resources Board. The LGUs or the concerned water utility shall apply for water rights from the Board, prior to implementing a project that would require extraction of water.
- (2) Water Rate Review: While the rate setting and approval functions remain largely a concern of the associations or the Water Districts (and LWUA), a vehicle for resolving grievances against unrealistic tariffs (or other practices) can be instituted by the LGUs. The court system, of course, remains as the final arbiter in conflicts.
- (3) Association Registration: The LGUs shall likewise adopt a registration and franchising system for associations responsible for water supply facilities outside the WD franchise areas. Annual reporting requirements will have to be established for monitoring and possibly, auditing purposes.
- (4) Water Quality: The National Drinking Water Standards have been established. The LGUs will have to establish a viable mechanism, including water testing and standards enforcement, to ensure that water delivered meets the potability standards. The DOH currently has the responsibility and the regulatory power to stop the operations of water systems not delivering potable water.

9.2.6 Financing System

(1) Water supply investment financing

In financing water supply investments, the LGUs may tap their Internal Revenue Allotment (or IRA) and/or locally generated revenues, or leverage these resources to borrow from government and private financial institutions. Overall, it is the LGU's responsibility to raise funds to support capital development sector projects and to ensure that adequate O&M reserves are raised by the beneficiary communities.

In the medium-term, the primary sources of funds are envisaged to be provincial and local taxes, allocation from the IRA 20% Development Funds, and the Municipal Development Fund. Also, in the medium-term, it is envisaged that national and external funds will continue to be channeled through local offices of central agencies.

Studies are underway to look into the feasibility of direct access of LGUs to external funds. The LGU will continue to monitor the developments and policy decisions to be established, as these will invariably affect local financing mechanisms. (For reference, "Accessing the ODA Funds" is presented in the Supporting Report.)

(2) Financing for sanitation activities

To support sanitation activities, housing improvement loans for installing in-house sanitary facilities should be studied and instituted by the LGU. Such a mechanism can be organized with the rural banks or the existing credit cooperatives. Seed funding for this revolving fund also needs to be raised. Upon agreement by the parties, the enabling local legislation establishing the sanitation revolving fund will have to be enacted.

The total resources for the above purpose could be augmented by establishing formal linkages with the home improvement loan facilities available through the Social Security Service (SSS), the Government Service Insurance System (GSIS), and the Pag Ibig Fund.

(3) Project owners should be fully responsible for providing sufficient funds for the sewerage, waste treatment and disposal, and sanitation requirements of their projects. Through their Municipal Engineering Office (MEO) and Health Office (MHO), and in coordination with the DENR, municipalities should strictly enforce the sanitation and sewerage requirements of the Building Code and environmental laws in issuing building permits, approving subdivision plans, and inspecting buildings and constructions.

9.2.7 Other Available Financial Arrangements

As previously mentioned, provincial and municipal leaders should monitor developments relative to the studies that are underway on the feasibility of giving LGUs direct access to external funds. Policy decisions on this would provide additional opportunities to accelerate improvements in the water sector.

In the meantime, LGUs should consider tapping existing programs that support the sector, particularly two major programs that are underway.

(1) ADB-assisted Rural Water Supply and Sanitation Sector Project

THE RW3SP is a 5-year project that supports the provision of Level I facilities in rural communities. It covers 20 provinces, including Biliran, Eastern Samar, and Southern Leyte in Region VIII, and is expected phase out the Year 2001.

1) Eligible Communities:

- The project is aimed at communities that:
- are deficient in water supply and have poor sanitation conditions;
- are willing to establish a BWSA; and,
- demonstrate willingness to be responsible for operation and maintenance costs, including depreciation, and to contribute labor for the construction of the facilities.

2) Implementing Agencies

The lead implementing agency is the DPWH, which manages and coordinates the project with other national agencies, particularly the DILG and the DOH.

The DILG coordinates and implements capacity building and community management training programs and, through NGOs, initiates community and LGU participation. DILG also carries out the socioeconomic surveys and community participation activities for the water projects, through its own and NGO resources and with the assistance of consultants.

The DOH, with technical assistance from the DPWH, assists the LGUs and the communities in the construction of public and household toilet facilities. It also implements training for health, hygiene education, and water quality control and surveillance programs. The DOH is also involved in the establishment and operation under the project of 50 Water Analysis Laboratories in the 20 provinces covered. Of

these, 8 will be located in Region VIII as follows: 2 in Biliran, 3 in Eastern Samar, and 3 in Southern Leyte.

4) LGU participation

The mayor, as chief executive of the municipal LGU, will be responsible for initiating projects with the assistance of the DILG. He/she will manage project activities at the municipal level, particularly the selection and formulation of water project proposals, project implementation, and training, in coordination with the DEO, the DOH office, and the DILG and NGOs.

At the provincial level, the governor will have overall responsibility for a provincial board which will appraise (through the PPDO) and approve project proposals submitted by the mayors.

5) Project opportunities for LGUs

This ADB-assisted project opens up for eligible LGUs a very wide range of opportunities that include the following, among others:

- Funding of up to 90% of the total cost of water and sanitation facilities (with labor contributions being eligible for the 10% counterpart).
- Technical assistance for overall community education, organization, skills training, and other types of capability development.
- Development of specific capabilities in relation to rural water projects, such as organizing BWSAs, community-based operation and maintenance, carrying out sanitary inspection of WSS facilities, collection and analysis of water samples, and implementing water projects.

(2) World Bank Assisted LGU-Urban Project

The Local Government Unit – Urban Water and Sanitation Project (LGUWSP) is a World Bank-assisted lending facility administered by the DILG with the Development Bank of the Philippines (DBP) as the depository institution, that local governments can tap to provide, expand or rehabilitate Level III water systems, as well as sanitation, drainage and other environmental services for their urban populations. This facility is most practical for municipalities whose urban population has expanded to create a demand level of at least 1,000 households. Where the water source is more than 7 km from the distribution area, a larger base of household users would be needed to make the project viable.

1) Eligible municipalities/cities

The lending facility is intended to support small and medium sized municipalities/cities, regardless of income class, which

- have not formed a water district;
- have a water district but are not in LWUA's current program of assistance.

2) Basic Project Rules

- a) The project promotes full cost recovery; that is, the tariff to be paid by the consumers should cover the cost of operation and maintenance and the repayment of the LGU DBP loan, and to the extent possible, the reimbursement of LGU equity; and
- b) The system shall be operated by a private operator under long-term lease contract with the LGU.

3) Description of loan facility

- a) Debt/equity: The LGUWSP can finance from 75%-90% of the project cost, with the municipality/ city putting up from 25% to as little as 10% of the equity.
- b) Eligible cost:
 - Feasibility study
 - Technical design
 - Construction of the water facility
- c) Interest, project duration: 15% per annum, 15 years (with 3-year grace period)

4) Availment procedures

- a) Submission to the WSSPMO-DILG of the following:
 - Letter of Intent/Interest to participate in the project (duly signed by the Mayor)
 - Supporting Sangguniang Bayan resolution expressing interest and willingness to secure loan from the DBP to fund the water project cost
 - LGU financial data
- b) Initial screening by DILG / DBP / WB technical group
 - Validation and analysis of financial data
 - Initial determination of LGU financial capability / borrowing capacity
- c) Preparation of feasibility study and detailed engineering design
 - Study to review scope of proposed water project, check availability / adequacy of source of water supply
 - Review of bases for population growth projections and consumer demand

- Formulation/ recommendation of LGU's technical options
 - Presentation to the community prospective end users of the technical option approved by the SB
- d) Passage of SB resolution authorizing
- Inclusion of the proposed project in the local development plan and public investment program (Section 296, LGC)
 - Loan for the proposed project
 - Appropriation of equity requirement
- e) Perfection of Loan Agreement between the LGU and DBP
- f) Construction of the facility
- g) Start of operation of the facility

5) Project opportunities

While the main thrust of the LGUWSP is to provide financing to cover the eligible cost items indicated under "Description of Loan Facility" (Item #2), it also covers other non-loan project components to assist the LGUs build up their capabilities to handle water sector projects.

The complete project components of the LGUWSP are as follows:

- a) Water and sanitation facilities component:
- Construction/improvement/rehabilitation of Level III water facilities
 - Provision / improvement of sanitation facilities
 - Construction /improvement of urban drainage
- b) Institutional development components
- Training of LGUs in decentralized planning, implementation and management of water facilities applying the following commercial principles:
 - Demand driven approach
 - Private sector participation
 - Full cost recovery
- c) Technical assistance component
- Feasibility study
 - Detailed engineering

9.3 Institutional Arrangements

This section of the report discusses both existing and proposed roles and responsibilities of agencies involved in WATSAN sector projects. Agencies that are presently involved include

national government offices precisely because the devolution of functions related to WATSAN activities is not yet complete. As the province's capability to implement WATSAN projects is enhanced in the medium-term, there will be a need for a unit that will coordinate WATSAN project implementation activities between and among national and local office. This coordinating body is the proposed PWSU (Provincial Water Supply and Sanitation Unit: tentative name).

9.3.1 Roles and Responsibilities of Agencies Concerned

In the implementation of WATSAN sector projects, respective governmental agencies from national to barangay levels shall play their roles as described below.

(1) National government Agencies

1) Department of the Interior and Local Government

The DILG, through its Water Supply and Sanitation Program Management Office or WSS-PMO shall coordinate with the funding agency, LGUs and other national government agencies involved in the project implementation. It shall be responsible to:

- a) develop the capacity of PWSU and MSL members in planning, training and organizing, WATSAN technologies, health and hygiene education, gender responsiveness, implementing, monitoring and evaluation of water and sanitation projects. The formation and tasks of PWSU and MSL are discussed in the following section (9.3.2).
- b) provide staff and administrative support, and development cost for the project. A Coordinator in each province shall be assigned to ensure project coordination at the provincial level. Its field personnel at the regional, provincial and municipal offices shall be utilized to assist in the capability building programs for LGUs. Monitoring of WATSAN projects shall be integrated in their regular functions.
- c) execute a Memorandum of Agreement (MOA) with the concerned LGUs. MOA shall include cost sharing arrangements with concerned province and municipality, utilization of vehicle and equipment support and possible allocation of LGU's amount out of their internal revenue allotment for the operation, repair and maintenance in the future.
- d) select NGOs to assist its capability building and community management programs for the LGUs and project beneficiaries to improve the delivery of project services and ensure sustainability.

- c) conduct orientation and information dissemination for the provincial officials on the project including requirements and strategies to obtain their support and commitment in pursuing the project;
- f) coordinate and utilize the technologies of DPWH and DOH including equipment and existing facilities; and
- g) procure vehicle, well rehabilitation equipment, maintenance tools, and water quality testing kits by means of bulk contract.

The other national government support agencies concerned and their respective functions in the project are:

2) Department of Public Works and Highways

The DPWH shall be responsible to:

- a) set and/or update, as and when necessary, technical standards for engineering surveys, design, construction, operation and maintenance of water supply system.
- b) upon agreement with the LGUs, assist in the conduct of engineering surveys and in the preparation of plans, specifications and programs of work, through its District Offices.
- c) upon agreement with the LGUs, assist in construction management, through its District Offices.
- d) conduct technical researches in coordination with the LGUs
- e) in the light of present-day directions in health management, emerging habits in water use, concerns arising from urbanization, environmental degradation, and the overall increase in pollutive activities, it is recommended that the DPWH conduct, on a priority basis, a thorough review to update existing technical standards in relation to water supply and sanitation systems.

3) Department of Health

The DOH shall be responsible to:

- a) set and/or update, as and when necessary, standards on water quality testing, treatment and surveillance, and sanitary practice.
- b) provide technical assistance to the LGUs in the conduct of periodic water quality control (once in every three months as stipulated in the Philippine National Standards for Drinking Water) and surveillance-related activities.
- c) monitor and evaluate, on a regular basis, health and hygiene education programs implemented by local health officers, particularly in areas where waterworks systems are expected to be constructed.

4) National Water Resource Board

The NWRB shall be responsible to:

- a) regulate the use of water resources through the issuance of water rights (for the Level I water supply projects, water right permit shall be confirmed upon the site selection is completed); and
- b) establish and manage a user-friendly water resources data management system.

(2) Local Government Units

1) Provincial Government

The province, through its PWSU that is to be newly organized, shall handle all activities related to the development of the sector in the province. As the WSS technical group at the provincial level, the PWSU shall provide the overall planning framework, technical support, and monitoring to enable the province to fulfill its sectoral targets.

The PWSU shall have combined functions of PPDO, PEO and PHO in the implementation of the sector projects. The role and responsibility of each member as well as the joint tasks to be undertaken among them shall be clearly defined. The head of the unit decides on WATSAN project issues and problems arising therein. The team member shall work hand-in-hand with the CO/NGO supervisor who shall be primarily responsible for the coordination of project activities at the municipal level. A focal person shall be designated from the PWSU members to serve as understudy of the CO/NGO to ensure social technology transfer before the phase out of the NGO intermediary. The PWSU, together with MSLT shall be primarily responsible to:

- a) annually update the PW4SP;
- b) prepare the program of work and implementation schedule;
- c) conduct information dissemination and consultation with the municipal and barangay officials;
- d) select and prioritize project sites using the selection criteria developed for the project;
- e) assist in organizing BWSAs for Level I water supply and RWSAs for Level II, and skills training for the BOD/officers, bookkeeper and caretakers of the operating body on operation, maintenance and repair;
- f) periodically apprise the Governor of the project developments;

- g) manage and monitor the utilization of vehicle and equipment procured under the project;
- h) monitor, evaluate and prepare reports on the progress of project implementation for submission to WSS-PMO in case of ODA assisted projects; and
- i) provide continuing technical and institutional assistance to the MSI and project beneficiaries.

A priority concern of the PWSU as soon as it is organized is to launch a province-wide IEC Program (as discussed in 9.2.4 item no. 5) to create strong awareness and active support for the sector's targets, based on the creation of safe water and sanitation values.

2) Municipal Government

Each municipality shall create a Municipal Sector Liaison Team (MSLT) from MPDO, MEO and MHO. The role and responsibility of each member as well as the joint tasks to be undertaken among them shall be clearly defined. A focal person shall be designated among them, preferable from MPDO, to serve as understudy of the CO/NGO to ensure social technology transfer before the phase out of CO/NGO intermediary. The MSLT shall work hand-in-hand with the CO/NGO and with the PWSU support. It shall be responsible to:

- a) select the priority sites/barangays in close coordination with the Municipal Development Council;
- b) conduct consultation meetings with the barangay officials/development councils and community members;
- c) facilitate the barangay water and sanitation survey and spot map, and prepare the survey summary report and spot map;
- d) organize BWSAs for Level I water supply and RWSAs for Level II, if necessary, and conduct skills training for the BOD/officers, bookkeeper and caretakers of the operating body on operation, repair and maintenance;
- e) assist the operating body in the establishment of proper systems and procedures for the collection of water charges, sanction for delay and non-payment, opening and operating bank accounts and budget allocation for the operation, repair and maintenance and cost recovery of the facilities;
- f) through its MHO/RHU and its network of barangay health workers and volunteers, conduct information campaign on proper health and hygiene education in the community;
- g) periodically apprise the Mayor of the project development;

- h) manage and monitor the maintenance tools and water quality testing kits procured under the project;
- i) monitor and prepare report on the status of project implementation for submission to the PWSU; and
- j) provide continuing technical and institutional assistance to the project beneficiaries.

3) Barangay

The barangay acts as a basic unit for the development. Barangay officials and development councils serve as the entry point for all development activities in the community.

The barangay officials will play an important role in planning and implementation of WATSAN projects. They shall collaborate with the PWSU/MSLT in gathering data/information and in undertaking various activities in the barangay such as in conducting survey and spot mapping by men and women volunteers, general assembly meetings and mobilization of resources in the community. The barangay officials/development council shall serve as advisor/facilitator of the operating body and community members.

(3) Communities

1) Barangay water association

Upon completion of the Level I water supply project, the facilities shall be turned-over to the operation body. A certificate of acceptance serves as a document of ownership of the beneficiaries and acceptance of their responsibility in the project. Upon decision of the community members, existing people's/community based organization, or a new water association (BWSA) shall be formed as an operating body.

The operating body shall own the project and shall undertake the responsibility for the operation, repair, maintenance and cost recovery of the facilities. Specifically, it shall be responsible to:

- a) regularly collect contributions from member-users for the operation, repair, maintenance and cost recovery of the facilities;
- b) maintain proper and updated financial records and transactions of funds;
- c) undertake minor repair of the facilities for Level I and II water supply facilities and in case of major repair, request assistance from the MSLT/PWSU members;

- d) encourage members to attend meetings and training activities mainly for Level I water supply;
- e) implement policies and procedures approved by the BOD/officers; and
- f) encourage members to observe proper health and sanitation practices.

2) Member-users

The duties and responsibilities of member-users include the following:

- a) pay monthly water charge contribution to the operating body;
- b) attend meetings and training activities designed for members;
- c) observe rules and regulations and policies approved by the BOD/officers;
- d) remind other water users to use the facility properly, especially for Level I and II water supply;
- e) keep the premises of the water facility clean, sanitary and free from excess water which may cause contamination of the water source; and
- f) adopt proper health and sanitation practices.

9.3.2 Institutional Arrangements

(1) Provincial Level - PWSU

In the medium-term, it is recommended that a full-time Provincial Water Supply and Sanitation Unit (PWSU) shall be operational. This is because of the expected large volume of work that will be required by the PW4SP and other ODA - and locally-funded WATSAN projects. The main functions of the PWSU will be:

- 1) to coordinate the planning and implementation activities related to the PW4SP, among the concerned national, provincial and municipal agencies; and
- 2) to continue to implement, assist and monitor all water supply and sanitation services in the province in coordination with the municipalities.

Over the long-term, the PWSU may be elevated to the same level as the PPDO to underscore the importance of the WATSAN sector in the development of the province.

The provincial government should ensure that the unit should be provided adequate logistical and financial support. The DILG-WSS/PMO should also continue providing technical and managerial assistance to the unit. Upon agreement with the LGU concerned, the DPWH - DEO should also continue to lend its water supply facility development capability to the province.

The initial professional-level staffing of the proposed PWSU will be as follows:

Provincial Water Supply & Sanitation Coordinator	1
Assistant Provincial Water Supply & Sanitation Coordinator	1
Community Development & Training Specialist	2
Water Supply & Sanitation Engineer	2
Monitoring Specialist	1
Total Personnel Required	7

- 1) The Provincial Water Supply & Sanitation Coordinator (PWSC) will lead an interdisciplinary PWSU. The PWSC will ensure timely preparation, implementation and reporting of sector and project progress based on the annual sector plan. For day-to-day operations, the PWSC will report to the Governor. The PWSC will also liaise with all project implementors at the municipal level. The PWSC shall be the key contact person of the DILG-WSS/PMO. Specific duties include:
 - a) Prepare guidelines, work plans and schedules for project implementation work at the municipal level; coordinate the work of consultants and NGOs in their various tasks.
 - b) Prepare a detailed work plan and program of activities for project implementation at the provincial level (including technical, financial and organizational aspects) and ensure regular reports on the progress of activities.
 - c) Guide the conduct of sector and project management and the supervision, and coordination of the PWSU; ensure the quality and timeliness of the outputs of the other agencies and consultants.
 - d) Assess all future inputs required for project planning, design, supervision of construction and monitoring in subsequent phases of project implementation.
 - e) Take steps to ensure that adequate financing is available to support the sector capital development requirements.
 - f) Assist in the negotiations for external grants and loans.
 - g) Recommend policy and policy revisions to govern sector and project management activities.

- 2) An Assistant Provincial Water Supply and Sanitation Coordinator will likewise be appointed to assist the PWSC in discharge of his/her duties and responsibilities of the PWSU.

- 3) The Community Development and Training Specialist (CDTS) will be particularly responsible for implementing the community development and involvement aspects of the project. His/her task will include frequent contact with the municipal liaison staff and barangays to ensure that all project activities are demand-driven and sustainable. The CDTS will report to the PWSC. Specific duties include:
- a) Identify initial areas and develop implementation arrangements for launching the project in the various municipalities.
 - b) Conduct regular dialogue and disseminate information among local leaders on water, sanitation and health issues.
 - c) Assist municipalities in overseeing the organization (or accreditation) of associations which will be responsible for water supply and sanitation facilities.
 - d) Coordinate the health and hygiene education program province-wide.
 - e) Review past training programs for water supply and sanitation, hygiene and sanitation education, and community organization and development, including any manuals or other training materials used.
 - f) Guide municipal liaison staff in developing/adapting a community training strategy and methodologies based on the principles of participation, adult education, experiential learning and task specific activities, including the review and development of training materials.
 - g) Prepare the overall provincial training plan enhancing management skills, institutional strengthening, improving technical skills, and community promotion, awareness and development. This should include: training methodologies; types and numbers of training events for staff and communities; training of trainers; training packages, manuals and audio visuals; management aspects of training program; and staff requirements and cost estimates for all categories of training including equipment and materials.
 - h) Assist municipal staff in identifying and selecting target communities and sites based on agreed upon criteria; develop methodologies and coordinate preliminary village surveys and gender analysis.
 - i) Assist in coordinating activities of the municipal liaison.
- 4) The Water Supply and Sanitation Engineer (WSSSE) will be responsible for all the technical aspects of the project including feasibility studies, design, construction, operation and maintenance. The WSSSE will report to the PWSC. Specific duties include:

- a) Review the existing technical and environmental situation relating to water supply and sanitation facilities and assess the needs for new facilities and rehabilitation.
 - b) Prepare and update criteria and process for the selection of water supply and sanitation facilities appropriate to the conditions prevailing in the project areas focusing on systems that can be operated and maintained by the community.
 - c) Review design standards for water supply and for on-site sanitation (human excreta disposal) facilities for individual households, communal and school latrines.
 - d) Establish appropriate design standards and technical specifications for water and sanitation materials and equipment applicable to systems proposed in the project. Establish quality control mechanisms for the procurement of materials and equipment as appropriate.
 - e) Prepare standard contract documents, specifications and cost estimates for civil works and procurement.
 - f) Ensure proper construction supervision and monitoring in coordination with the municipal liaison. Ensure timely transport of LGU-provided materials to project sites.
 - g) Provide for adequate maintenance of LGUs equipment and tools for water and sanitation facilities, including drilling rigs and vehicles.
 - h) Supervise major repair or rehabilitation work beyond the capacity of communities to undertake.
 - i) Implement, in coordination with the PHO, the water quality surveillance system. Assist the PHO in enforcing sanctions or remedial measures in controlling drinking water quality.
- 5) The Monitoring Specialist (MS) will be responsible for ensuring that the status of sector projects and outputs are properly reported and fed back to management. His/her task will include frequent contact with the municipalities to ensure that all project activities are demand-driven and sustainable. The MS will report to the PWSC and liaise closely with the PPDO who has the responsibility for monitoring all development activities and needs in the province. Specific duties include:
- a) Draft all project reports and documents including the quarterly and annual sector report.
 - b) Maintain the registry of associations responsible for water and sanitation in their respective communities.

- c) Coordinate and develop indicators for monitoring and evaluating the achievement of project objectives.
- d) Monitor actual costs for typical water supply and sanitation systems.

(2) Municipal Level - MSL

At the municipal level, a Municipal Sector Liaison (MSL) will be appointed by the respective mayors. The municipal development coordinator, the municipal engineer, the municipal health officer or any other qualified staff selected by the mayor may be appointed as the MSL.

The role of the MSL will be very critical at all stages of sector and project management. The MSL should ensure that the activities guided by PWSU are implemented at the barangay level, particularly information dissemination about funding opportunities. The MSL receives all requests for water and sanitation facilities including the commitment of the barangays to provide counterpart funds or labor for the projects. The MSL also recommends the programming of municipal funds (from municipal IRA allocation or other sources) to provide counterpart support or to fully finance the projects.

Supported by the PWSU, the MSL ensures that a viable organization is set up or appointed to handle the operation, maintenance and fee collection for the water system. The MSL also reviews the detailed project plan and design. During implementation, the MSL monitors the construction and drilling activities. The activities of the MSL will be closely coordinated and reported to the PWSU. If warranted, the mayor should establish a municipal water and sanitation office in the long-term future to handle all the above functions when the level of activities shall have become substantial.

(3) Barangay Level

At the barangay level, the Barangay Council (BC), through its Committee on Health, and the Rural Health Unit (RHU) plays a major role in concretizing the community aspiration for improved water and sanitation services.

The BC is the entry point for all development activities in the community. Particularly, it will play an important role in preparatory stage before setting up the association (or appointment of the responsible group). The BC prepares the request for assistance and assembles available local resources (funds, manpower, materials) to serve as initial community counterpart to demonstrate barangay commitment.

The RHUs and their network of barangay health workers (volunteers), on the other hand, have established an effective primary health care delivery system in the province. The system will continue to provide, among others, health and hygiene education services focusing on the interdependence of safe water supplies and sanitary toilet facilities to achieve overall health and environmental benefits. The RHUs will be the principal data collectors to monitor the conditions in access and coverage of water supply and sanitation services.

(4) National Level – DPWH, DOH, DILG

At the national level, DPWH, DOH and DILG will continue to provide technical assistance to LGUs per NEDA Resolution No.4 (series of 1994), either directly or through their local field offices. In addition, mandated government agencies, such as LWUA, will continue to provide technical and managerial services and loans to duly-organized water districts and RWSAs. Through the DOF and DBM, the IRA allocations will continue, from which a portion can be allocated for sector projects. Since this IRA allocation for water and sanitation projects will likely be very limited, the LGU will have to coordinate with appropriate national agencies to gain access to external funds. Regulations, promulgated and enforced by national regulatory bodies, like the NWRB, will have to be complied with by the LGU.

9.4 Project Management Arrangements

In implementing specific WATSAN projects, there are several approaches / strategies which are recommended that will increase the likelihood for success and sustainability over the long term. These general approaches / strategies should be treated as minimum project requirements, which can be enhanced or improved upon to further ensure the project's success and sustainability.

9.4.1 Project Approach/Strategy

(1) Capacity Enhancement

- a) Creation of support structure at the provincial and municipal levels (PWSU and MSI, respectively) with clearly delineated roles and responsibilities of each member as well as the joint tasks to be undertaken by them.
- b) Improving information dissemination to and consultation with local officials at the provincial, municipal, and barangay levels to secure full support and cooperation in the execution of the project.

- c) Tapping NGO intermediaries to assist in the capability building and community management programs for the LGUs and project beneficiaries.
- d) Capability building shall be undertaken at various levels, from the national to the beneficiary levels. A Consultant shall develop the capacity of the WSS-PMO and NGOs, who in turn shall be responsible to develop the capacity of LGUs (PWSU, MSL) and CO/NGOs. Finally, LGUs shall develop the capacity of the project beneficiaries who are to operate and manage the projects.
- e) Consultancy services shall be availed of to assist the executing and implementing agencies' capabilities in the successful implementation of the project.

(2) Service Level Determination

- a) The appropriate service level for a geographical area shall be determined in the following manner:
 - at the initial stage of the project, the public will already be consulted regarding their needs, desires, and willingness to pay;
 - before construction begins, all parties will sign an agreement acknowledging their respective roles and responsibilities;
- b) Communities with no existing water system will be encouraged to adopt Level II systems instead of Level I systems, subject to a validation of the technical feasibility and the prospective users' willingness to participate in the construction, operation and maintenance of the system.
- c) Existing Level III systems will be encouraged to expand their coverage to the fringe areas, subject to the results of studies on prospective demand, technical feasibility, and financial feasibility.
- d) Existing Level III systems that are in close geographical proximity to other existing Level III systems will be encouraged to merge in order to achieve economies of scale.

(3) Community Participation

- a) The selection criteria for the priority sites will be the community demand for the level of service. Demand assessment shall be made through participatory beneficiary assessment prior to construction of facilities in the barangays.
- b) Tapping existing people's/community-based organizations as operating body of the project. Merger or consolidation with the existing water association in the barangay shall be considered before forming a new one.
- c) Community participation shall be incorporated in all phases of the project - from planning to evaluation. Community participation shall be undertaken through consultation and interactive participation with the community members.

- d) A greater participation of women shall be required in the planning, implementation, management, and monitoring of WATSAN projects.
- e) Integration of water supply, sanitation and hygiene education and provision of information, education and communication materials to the community members.

(4) Cost Recovery

- a) LGUs shall adopt commercial principles in the operation and management of water utilities in order to provide cost effective and reliable services to consumers.
- b) Community equity contributions and LGU counterpart shall be required and will serve as an indication of willingness and commitment to participate in the project.
- c) Cost recovery through regular water charge collection from the end-users shall be a requisite of the project.
- d) Funds collected from the end-users shall be utilized for operation and maintenance and future rehabilitation and reconstruction. The funds shall not be included in the general account of LGUs, even if the waterworks is owned by the LGU.
- e) Merging of operating bodies may be studied to save on O&M cost and maximized the utilization of limited manpower resources.

(5) Feedback Mechanism

- a) A participatory monitoring and evaluation system shall be installed in partnership between the LGUs and beneficiaries.
- b) Monitoring and evaluation shall start during the project implementation. The system must have clear objectives and the right indicators - sustainability, effective use, and replicability.

The success of water and sanitation projects in most cases depends on the strength of the institutional arrangement and mechanism. Therefore, it is imperative that each institution as well as those personnel involved in the project should have a clear grasp of their respective responsibilities in the various stages of project implementation. Figure 9.4.1 and 9.4.2 in the Supporting Report shows in detail the project implementation arrangement and procedure for Level I water supply and sanitation from the national to barangay levels. These have been designed to encourage active participation of implementers and beneficiaries in undertaking the project.

9.4.2 Project Implementation Arrangements

(1) Level I

Figure 9.4.3 depicts the Activity Process Flow for Level I Facilities. The following key requirements should be noted:

- 1) **Project Selection:** Self-selection and local initiative should be the basis. All barangays should be well-informed about sector opportunities and policies. The barangays should take the first step by assessing their needs, deciding that they want to improve their water and sanitation above all other needs and expressing their aspiration. The initial tasks of LGUs will be social marketing and information dissemination. The barangay should also decide desired service level/s, with a full understanding of the cost recovery aspects and other responsibilities.
- 2) **Organization of associations:** More flexibility is needed in order to tap local community resources. The issue of the necessity of forming BWSAs has been raised on several occasions. The proliferation of single-purpose associations for every government-sponsored project tends to divide barangay resources and complicate barangay structures. Many socio-civic groups have in fact "adopted" facilities and are looking after their maintenance voluntarily. Actual success rate seems to be higher in areas where water supply is extremely difficult regardless of whether there is monitoring or not.

The basic principle is that the community agrees that a particular group at the local level will be responsible. Existing local groups with other socio-civic objectives, an active track record and which are ready, willing and able to take on the BWSA functions may be tasked with the responsibility for the facilities. LGUs will assess the situation and, if justified, approve alternative non-BWSA arrangements. BWSA formation, of course, remains an option. An "institutional accreditation" system can be organized. If the association fails to live up to its responsibilities, it can lose its accreditation to another group.

The association can decide how to organize itself internally in coordination with the municipal sector liaison. The important condition is that all functions have to be attended to. Thus, an association may subdivide itself by "puroks" or it may choose to operate as one institution.

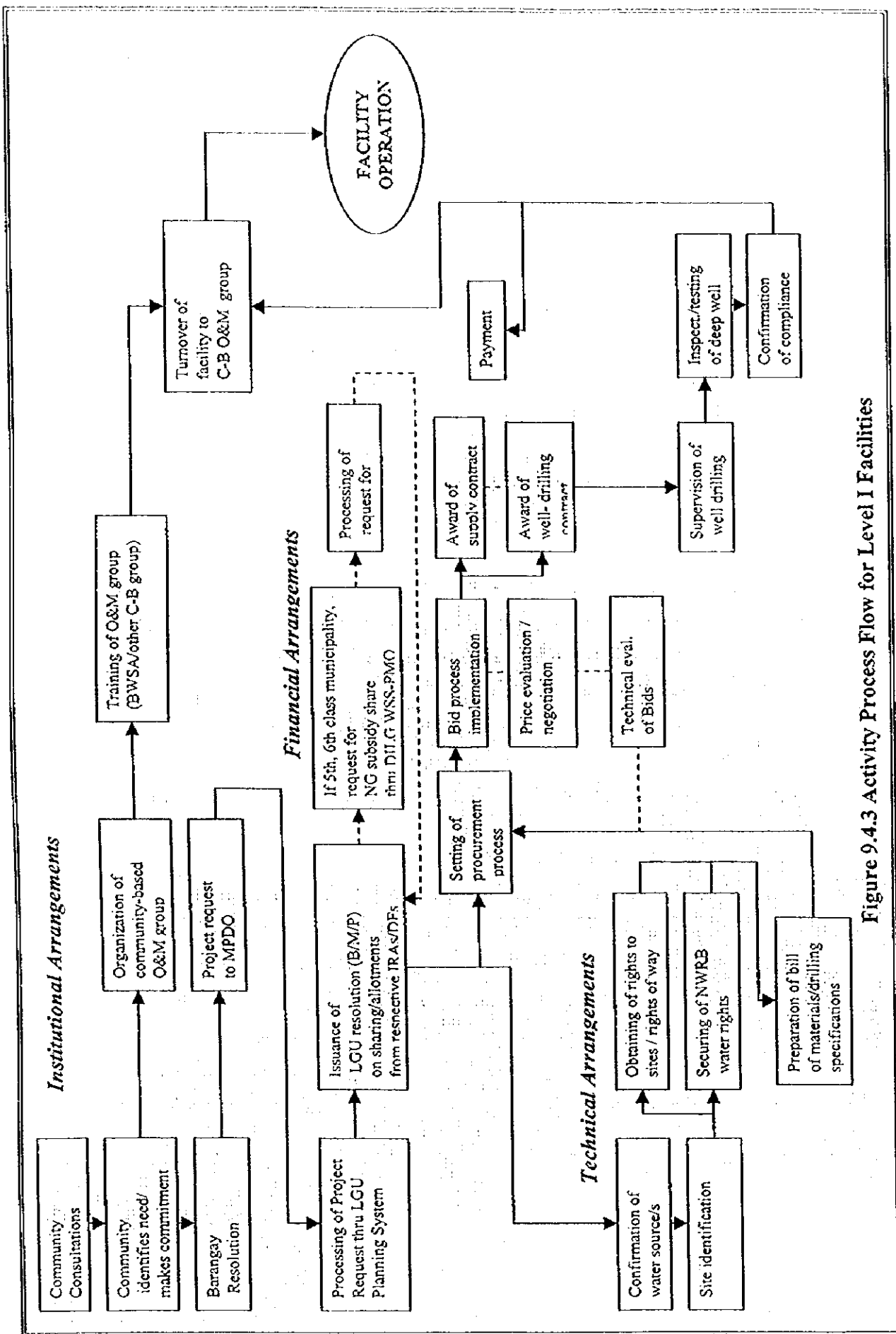


Figure 9.4.3 Activity Process Flow for Level I Facilities

- 3) **Technology and Technical Design Standards:** The former Rural Waterworks Development Corporation (whose functions were absorbed by LWUA) and the DPWH have developed a simplified procedure for conducting the initial data gathering. The formats, which are appended (Table 9.4.1 Supporting Report), may be adopted and used by the LGUs. If necessary, these forms can be revised to suit the specific needs of the barangay or municipality.
- 4) **Bidding of works and procurement of services and materials** should follow provision of PD 1594 and other appropriate government policies and practices. Where possible, major capital procurement shall be sourced within the province.
- 5) **Construction and Drilling:** Drillers and civil work contractors will be needed for any major rural water supply and sanitation undertaking. Construction inspection shall be done with the municipal sector liaison.
- 6) **Right of Way Acquisition:** Deed of Donation (or written permits to grant use of land) for proposed facility sites should be executed in favor of the municipal government/barangay prior to project approval.
- 7) **Major rehabilitation work, beyond the capacity of the associations, shall be referred to the municipality for action.** Clear definition of "major rehabilitation work" is needed. All costs incident to the rehabilitation shall be to the account of the association O&M reserve fund. The municipality supported by PWSU will assist, if needed, the association in securing soft loans, if the reserve funds are inadequate.
- 8) **Operation & Maintenance will generally be the responsibility of the association.** To support the caretakers, a franchising system for major O&M activities may be instituted by the municipality (through a private firm, a major Water District in the area or any other competent group). Mechanics and plumbers can organize well-equipped "mobile service centers" which visits all the facilities monthly to check-up facilities and provide technical advice on behalf of the LGUs.

With standardization, local hardware stores will find it more profitable to stock up on needed spare parts. The LGUs should not maintain spare parts, although it is expected to maintain a ready stock of fast-moving spares.

9) **Water Rate Setting:** Fees and rates shall be established and approved by the community prior to construction. The fees shall be sufficient to cover all monthly operation, maintenance and administration costs, as well as to establish a reserve fund.

10) **Fees Collection and Funds Management:** The association shall collect monthly fees. All funds of the association shall be deposited in a bank to be selected by the association.

(2) **Level II**

Figure 9.4.4 depicts the Activity Process Flow for Level II Facilities. The following key requirements should be noted:

- 1) **Project Selection:** Guidelines similar to that of Level I project selection shall be followed, i.e., self-selection and local initiative. Two or more barangays (or puroks) may agree to have a joint water and sanitation project.
- 2) **Organization:** The RWSA model may be followed by the participating communities. Again, flexibility will be followed and alternative models for managing the system may be considered.
- 3) **Technology and Technical Design Standards:** Technical standards have been in use by LWUA for RWSAs and by DPWH for Level II systems. (refer to Table 9.4.2 with annexes, Supporting Report). As these are considered as national standards, they will be adopted by the LGUs.
- 4) **Bidding of works and procurement of services and materials** should follow provision of PD 1594 and all other applicable national and local legislation on bidding and award of contracts using public funds. LWUA uses standard formats and procedures for this process, which may be adopted by the LGUs.
- 5) **Construction would usually be done by a contractor:** Inspection would be undertaken by the RWSA; by the cooperative or the private developer; or by the LGUs depending on the institutional arrangement adopted.

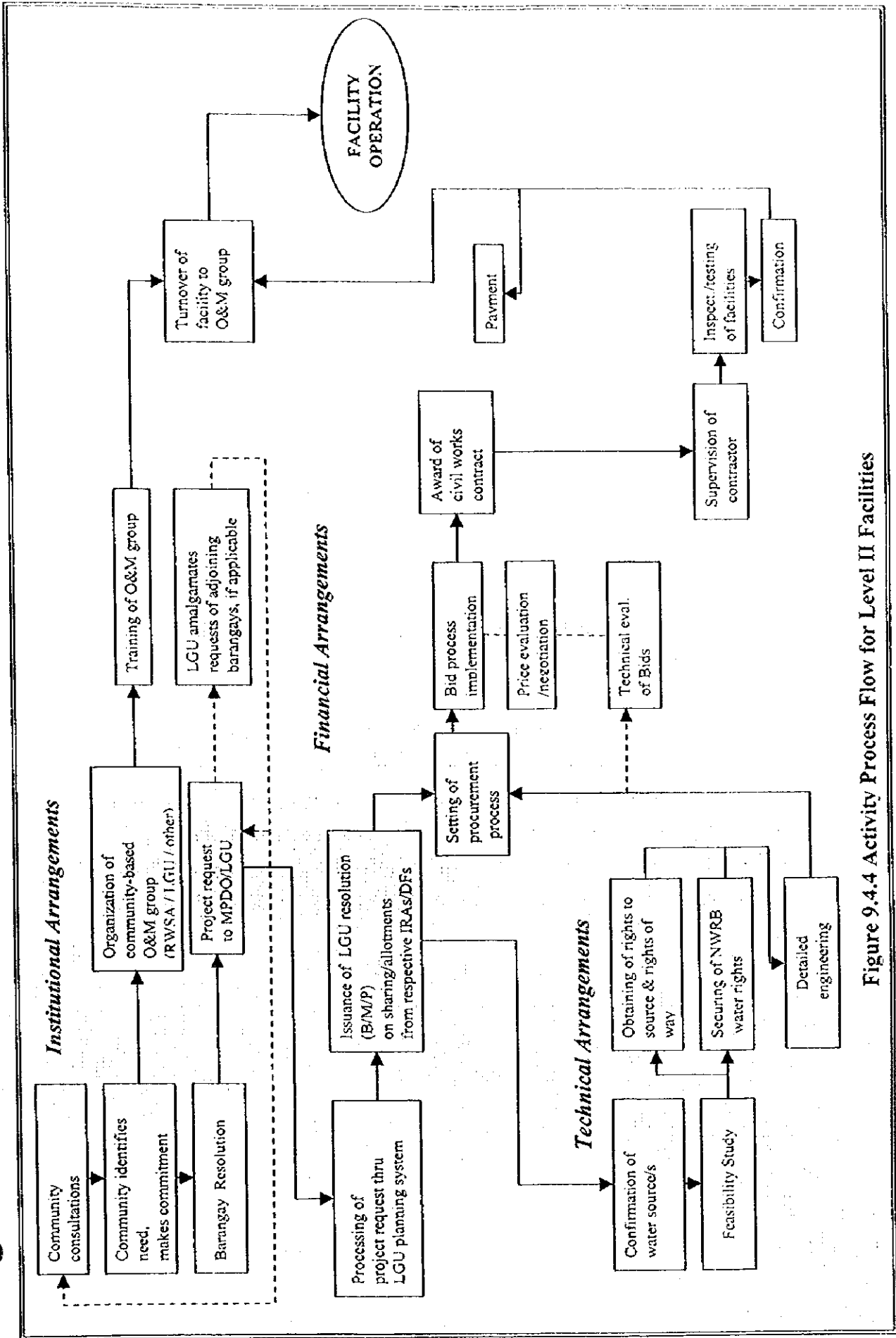


Figure 9.4.4 Activity Process Flow for Level II Facilities

- 6) Right of Way Acquisition. The association shall negotiate for the purchase of land on which facilities will be constructed. Should negotiations fail, the government may exercise the power of eminent domain to secure needed land.
- 7) Operation & maintenance and rehabilitation will be the responsibility of the association. It shall ensure that adequate tools and spare parts are available. It shall employ needed staff and caretakers.
- 8) Water Rate Setting: All fees shall be subject to public hearing and approval by the appropriate regulatory authority.
- 9) Fees Collection and Funds Management: Same policies for Level I shall apply. However, fee computation shall include provision for debt service and possibly a higher reserve requirement.

(3) Level III

Figure 9.4.5 depicts the Activity Process Flow for Level III Facilities. The following key requirements should be noted:

- 1) Project Selection: Level III systems are to be initiated by the municipal governments. In principle, all communities (including rural areas) may request Level III services provided that they are willing and able to take on the financial and managerial obligations for higher service levels. Viability and affordability are issues, however, so that appropriate studies need to be undertaken to apprise communities of the costs and financial obligations involved. The point is that service level selection is community decisions.
- 2) Organization: There are several viable Level III models, which may be adopted: the Water District Concept; a LGU-managed system; a cooperative-run system; or a privately-owned and managed system (refer to 5.2 Data Report). The LWUA water district concept was briefly described in the preceding chapters. For detailed information, the LGUs should contact and coordinate with LWUA. The second option for the LGUs is to maintain operational control over the utility. Current experiences, however, reveal many difficulties because of numerous government controls and restrictions. Preferably a separate economic unit or enterprise may be set

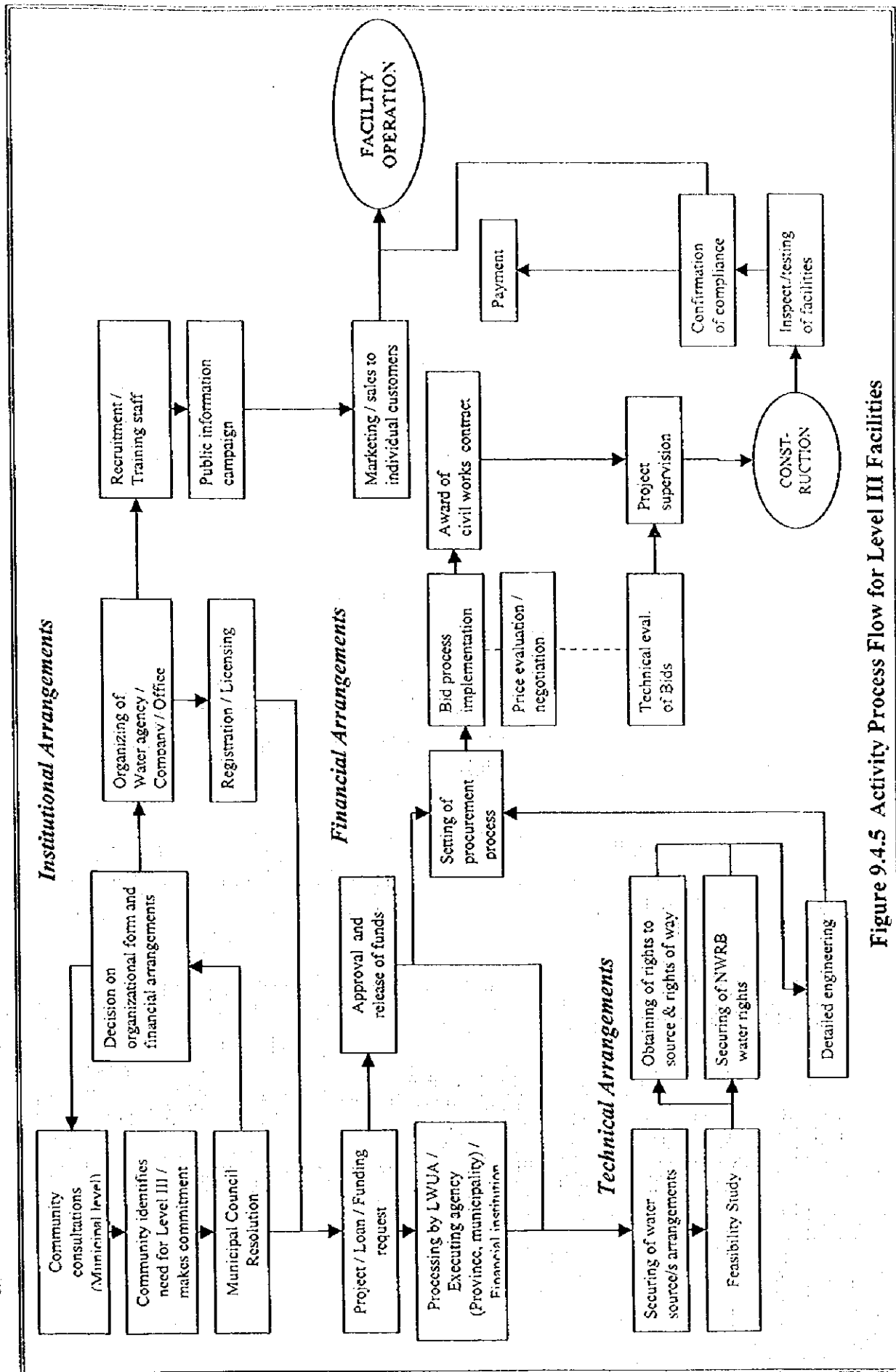


Figure 9.4.5 Activity Process Flow for Level III Facilities

up. The private sector may be a viable option. It may use the BOT mechanism or it may invest on a long-term basis in larger systems.

- 3) **Technology and Technical Design Specifications:** Regardless of the type of institutional model adopted, the technical design standards to be enforced should be uniform. Technical standards used by the water districts and LWUA will be adopted and enforced by the LGUs.
- 4) **Bidding of works and procurement of services and materials** shall follow the provision of PD 1594 and all other applicable national and local rules on bidding and award of contracts using public funds. The LWUA uses standard formats and procedures for this process and the LGUs may adopt this.
- 5) **Construction by a private contractor is preferred.** Inspection will be conducted by the water district; by the cooperative or the private developer; or by the LGUs depending on the institutional arrangement adopted.
- 6) **Right of Way Acquisition:** The waterworks will have to negotiate for the purchase of land on which facilities will be constructed. Should negotiations fail, the government may exercise the power of eminent domain to secure needed lands.
- 7) **Operation & maintenance and rehabilitation** will be the responsibility of the waterworks. It shall ensure that adequate tools and spare parts are available. It shall employ needed staff and caretakers.
- 8) **Water Rate Setting:** All rates are subject to public hearings and approval by the appropriate regulatory authority.
- 9) **The waterworks shall establish a formal billing and collection system and business practice systems shall be adopted.** The LWUA has established a comprehensive commercial practice system, which may be adopted by the organization.