The Department of Environment and Natural Resources (DENR) formulates and enforces policies and guidelines for environmental protection and pollution control. It is responsible for watershed protection and water resources management. It checks compliance of major projects with environmental guidelines. DENR works with all environmental management agencies and special regulatory bodies.

The Department of Education, Culture and Sports (DECS) implements hygiene education programs through schools using the *Teacher-Child-Parent (TCP)* approach. Health and sanitation messages are integrated in the curricula and special activities are designed to make the parents and other family members learn and put them into practice. The program is supplemented by a wide range of learning materials (workbooks) while prototypes of safe water sources and water-sealed toilets are set up in schools. DECS assists in the GOP school toilet building project by identifying priority schools and by supporting DOH's integrated health information, education and communication campaign using the formal and non-formal educational system.

The National Water Resources Board (NWRB) coordinates the overall policy framework for water resources development and management. NWRB was created to guide an orderly and scientific development of all water resources in the Philippines consistent with the principles of optimum utilization, conservation and protection to meet present and future needs. NWRB also deals with water rights issues. NEDA Board Resolution No. 4 strengthens the NWRB by increasing its control over the private extraction of groundwater.

The Metropolitan Waterworks and Sewerage System (MWSS) provides for the potable water supply and sewerage needs of Metropolitan Manila and its contiguous areas.

5.5 Sector Agencies at the Local Level

(1) Provincial Level.

Under Sec. 17 of the Local Government Code, the LGU is responsible for the sector functions including: delivery of health services and infrastructure facilities intended to service the needs of the province, such as intermunicipal waterworks, drainage and sewerage, among others.

1) The Provincial Planning and Development Office (PPDO), as secretariat of the Provincial Development Council, integrates and coordinates all sectoral plans and

studies undertaken by the different functional groups or agencies (refer to Figure 5.5.1, Supporting Report). It is tasked to monitor and evaluate the implemention of the different development programs, projects and activities in the provincial government in accordance with the approved development plan.

2) The Provincial Engineer's Office (PEO) is mandated to initiate, review and recommend changes in policies and objectives, plans and programs, techniques, procedures and practices in infrastructure development and public works (refer to Figure 5.5.2, Supporting Report). It also administers, coordinates, supervises and controls the construction, maintenance, improvement, and repair of engineering and public works projects of the province. It has the responsibility of providing engineering services to the province, including investigation and surveys, engineering designs, feasibility studies and project management.

3) The Provincial Health Office (PHO) is given the power to formulate and implement policies, plans, programs and projects to promote the health of its people (refer Figure 5.5.3, Supporting Report). It is mandated to ccordinate with other government agencies and non-government organizations involved in the promotion and delivery of health services. It shall execute and enforce all laws, ordinances and regulations relating to public health.

The Provincial Governnent is in the process of integrating the development efforts of the sector. Before the enactment of the Code, the PHO was mainly responsible for sanitation and the DPWH, for water supply projects. The PPDO, PEO and the PHO work closely on sector programs and activities, as described in the foregoing.

Project identification and priority setting: Projects are identified either by the PEO, the PHO or the municipality (or barangay) concerned. The lower level LGUs forward resolutions to the Provincial Governor requesting for funding support. Projects are prioritized based on the endorsement of the Provincial Development Council and approved by the Sangguniang Panlalawigan and the Governor.

Project preparation and planning: For water supply projects, the feasibility study is done by the PPDO, while the detailed design, by the PEO. For sanitation projects, feasibility study and plan preparation are both done by the PHO. Only projects which have been identified and priority-listed undergo feasibility study and detailed design.

Project Implementation: Locally-funded sanitation projects are implemented by the PHO while water supply projects are constructed by PEO following national standards. The implementation of all infrastructure projects is the responsibility of the PEO. Non-infrastructure projects are handled by the concerned implementing office. Community organizing was implemented by the PPDO under the former BWP-assisted projects.

Operation and Maintenance: The PHO and PEO provide technical assistance to established RWSAs. However, the Provincial Government receives technical assistance from the DOH and the DILG.

Monitoring and evaluation: Current monitoring and evaluation systems focus on measuring the physical output of the sector projects. It is, however, is weak in impact evaluation. Physical accomplishment are noted, however, measurement of socio-economic benefits is difficult.

Financing: The present source of local financing for the sector projects is the 20% Fund from the IRA of the province. There are also foreign and local donors for sector projects. General appropriations funding is generally channeled through central-level agencies.

The Government Accounting and Auditing Manual in the procurement of goods and services and in the awarding of civil works contracts is followed by the Province.

Linkage with national government agencies: The Province works closely with the Regional Development Council for endorsement of programs/projects requiring national or foreign funding.

(2) Municipal and Barangay Level

The municipality is responsible for provision of services and facilities related to general hygiene and sanitation, including solid waste disposal management. The barangay manages the services and facilities related to general hygiene and sanitation, beautification, and solid waste collection. Both the barangay and municipality are still adjusting to the devolution. These LGUs rely on the provincial and central government for the funding and implementation of sector projects.

1) Municipal Planning and Development Office (MPDO)

Mandate: The MPDOs are mandated to monitor and evaluate the implementation of various development programs and activities in the municipality. They are also tasked to prepare municipal development plans and formulate an integrated economic, social and physical development plan.

Activities: The regular activities of MPDOs include: preparation of the municipal comprehensive plans and other planning documents; assessment, monitoring and evaluation of different projects of the municipal government; and assistance in the integration and coordination of all sectoral plans.

Resources: The Municipal Planning and Development Office typically consists of the following personnel: Municipal Planning and Development Coordinator as head of office; Project Development Officers; Project Evaluation Officers; Community Officers and Draftsmen.

2) Municipal Engineer's Office (MEO)

Mandate: The MEOs are responsible for the administration, coordination, supervision of all construction, maintenance, improvement and repairs of the different public works projects in the municipality. They also initiate, review and recommend innovations in policies and objectives, plans, programs, techniques, procedures and practices in infrastructure development in the municipality.

Activities: The MEOs regularly perform engineering surveys to obtain technical data for the design, layout or construction of waterworks systems, sanitation facilities, roads, bridges and other infrastructure projects. They also inspect work of contractors based on plans and specifications.

Resources: The MEO is typically composed of the municipal engineer, a staff engineer who prepares technical plans, specifications and designs and a draftsman who maintains equipment records and drafts simple plans.

3) Barangay Councils

The Barangay Councils provide, among others, for the maintenance of barangay facilities related to general hygiene and sanitation and solid waste collection. It also

submits recommendations to higher legislative bodies for the improvement of the barangay health and social welfare services.

4) Rural Health Units/Barangay Health Stations

RHUs are under the supervision of the Municipal Health Officer. In 1992, there were 32 barangay health stations and 11 rural health units where a variety of medical services like, medical application, bandaging and inoculations are administered under the direction of Rural Health Officer.

(3) Field Offices of Central Sector Agencies

1) DPWH District Engineering Office

Mandate: The DEO mandate includes the implementation and rehabilitation of water supply projects in the province. Its basic functions include identification of possible well sites, drilling operations, equipment keeping, and continuous monitoring of implemented water supply projects.

Activities: Its present water supply activities are rather impressive. Its recent projects include:

Projects	Cost (Peso)	Status
Water Supply (level I)		
Poblacion, Calintaan	500.00	Completed as of 12-14-93
Manoot, Rizal	100.00	- do -
San Francisco, Sablayan	100.00	- do -
Mendiola, Sta. Cruz	100.00	- do -
Monte Claro, San Jose	100.00	- do -
Spring Development		
San Jose (Naitan Spring)	47.50	Completed 1-25-94
Construction of Deep Well		
Locotan, Abra de Ilog	76.00	Completed 5-31-92
Saraton, Calintaan	76.00	Completed 4-30-92
Ayasan, Paluan	76.00	Completed 5-31-92
Balong Moro, Mamburao	76.00	- do -

Batirawan, Magsaysay	89.00	Completed 4-30-92
Ticod, San Jose	76.00	- do -
Bayotbot, San Jose	76.00	- do -
Angolan, Sablayan	80.00	Completed 4-15-92
Libuban, Sablayan	80.00	- do -
Masaya, Sta. Cruz	80.00	- do -
Cambaog, Rizal	80.00	Completed 4-30-92
Kawayan, Sta. Cruz	76.00	Completed 5-31-92
<u>Construction of Spring</u>		
Iriron, Calintaan	872.00	Completed 5-31-92
Burgos, Sablayan	150.00	Completed 4-30-92
<u>Construction of Shallow Well</u>		
Tugan, Abra de Ilog	9.80	Completed 5-31-92
Gawaygaway, Calintaan	9.80	Completed 4-30-92
Paraypay, Magsaysay	9.80	- do -
Lanas, Mamburao	9.80	Completed 5-31-92
Igamos, Paluan	9.70	- do -
Canwaling, Rizal	9.70	Completed 4-30-92
Tuburan, Sablayan	9.70	Completed 5-31-92
Bangaway, Sta. Cruz	9.70	- do -
<u>Rehabilitation of Deep Well</u>		
Tibagin, Mamburao	7.00	Completed 4-30-92
Dayap, Sta. Cruz	7.00	- do -

Resources: The water and sanitation section of the DEO is a unit under the Construction Division. At present, existing positions under this unit include a Well Driller Supervisor and Well Driller II. The DEO maintains one drilling rig.

2) Local Development Council/Provincial Development Council

The main function of the LDC is to formulate long-term, medium-term and annual socio-economic development plans and to coordinate, monitor and evaluate the implementation of development programs and projects.

The PDC is headed by the Governor and is composed of all municipal mayors, the Chairman of the appropriations committee of the Sangguniang Panlalawigan, the Congressman and representatives of NGOs operating in the province.

(4) Water Districts

A water district is a local government corporation formed pursuant to Presidential Decree No. 198, organized for the purpose of serving the water supply requirements of the residents within its franchise area. Technical and financial assistance (loans) are provided by LWUA to the water districts. LWUA also exercises regulatory functions vis a vis the districts.

A water district, to be self-sufficient, is operated in a business-like manner to generate enough revenues from its water sales. The income is used to meet operational expenses, debt service and reasonable reserves for contingencies.

At present, there are only two (2) water districts in Occidental Mindoro located in San Jose and in Sablayan.

(5) Rural Waterworks and Sanitation Associations

RWSAs are organized by beneficiaries to facilitate participation in the planning, construction, operations, maintenance and management of water and sanitation projects. The RWSA operates and maintains the community water supply system. The members contribute at least 10% of the project cost as local equity and pay a monthly service fee sufficient to operate, maintain and amortize the project. Most RWSAs provide Level II or III service.

(6) Barangay Waterworks and Sanitation Association

The BWSA is a voluntary association of at least 50 households organized for the purpose of mobilizing community resources to provide adequate Level I supply of safe and potable water. It aims to improve the health and economic well-being of its members, by improving access to safe and potable water for domestic use at a reasonable cost. It is a non-stock cooperative which manages and owns the water supply facility constructed through their own resources or with external capital development assistance.

The association is mandated 1) to operate, manage and own the water supply facility; 2) to mobilize the members' resources (financial contributions to the cooperative fund) for the construction, operation and maintenance of the system.

The organizational structure of the BWSA consists of 1) General assembly of members; 2) Board of directors; 3) Election committee; 4) Education and training committee; 5) Audit and supervisory committee and 6) Management staff.

To organize a BWSA, a community meeting is convened and the barangay leaders are informed that the barangay has been selected by the LGU for possible water supply assistance. This is usually preceded by a resolution from the barangay requesting for the assistance. A structural survey is conducted to determine whether the barangay meets the criteria for assistance. The survey also forms the basis of the feasibility study. The LGU then prepares a preliminary engineering report and feasibility study which is presented to the barangay for approval. Upon acceptance by the people, the LGU submits the annual implementation plan (AIP), together with the FS for funding allocation.

Upon approval of the AIP, the application to organize a BWSA is filed with the PPDO who forwards the application to the Director of the Cooperative Development Authority, and the BWSA is formed.

(7) Others (including the private sector and NGOs/CBOs)

The private sector has been involved in water supply development in the form of investments, technical studies and construction of water supply and sanitation facilities. Non-government organizations (NGOs) have also demonstrated capability to undertake project development and implementation with community participation.

The private sector is represented in both the PDC and the Provincial Health Board. Its participation is limited only to endorsement of projects/programs.

5.6 External Support Agencies Active in the Sector

(1) Multilateral Agencies

The World Bank (IBRD) currently supports the First Water Supply, Sewerage and Sanitation Sector Project or FW4SP (Loan 3242PH). This project provides capital funds

(US$ 58.0 M) for rural water supply in Luzon provinces and sanitation nationwide based on completed provincial master plans. The project concept calls for a community-based approach through BWSAs. The project is due to close in 1995 and preparations for a successor project, with DILG as implementing agency, will be started shortly. In addition, the Bank is preparing two new loans for LWUA implementation - the Urban Water Supply Project and the Urban Sewerage and Sanitation Project. Through its various trust fund facilities, the Bank has arranged for various technical assistance grants and other support activities.

The Asian Development Bank (ADB) supports the Second Island Provinces Project (1052-PHI-SF). The project provides US$24.0 M (loan) to a counterpart budget of Pesos 202.45 M. A small technical assistance component has been allocated for well drilling, training, water quality and installation of pumps. This DWPH-executed project was effective through 1994. Both of the island provinces projects focus on technology and the physical installation of facilities. A follow-on third "islands project" is under discussion. ADB is also supporting the LWUA Municipal Water Supply Project which includes a technical assistance grant for institution building activities at LWUA and the eight (8) participating WDs.

The United Nations Development Programme (UNDP), through its Danish Trust Fund facilities, has actively supported the preparation of provincial master plans. In addition, its Institution Building through Decentralized Implementation of Community-Managed Water and Sanitation Projects, is assisting DILG-PMO in developing models and approaches for community-based water and sanitation in selected pilot areas. The project bears a strong poverty alleviation focus. UNDP is also in the final stages of a country project to assist GOP in strengthening the groundwater databank in the country through a US$ 682,500 grant.

The United Nations Children's Fund (UNICEF) supports the sector through the Philippines Plan of Action for Children. Apart from hardware support in priority project sites, UNICEF assists NEDA in updating of the national master plan. UNICEF works through the inter-agency committee on environmental health and through NGOs. With the World Health Organization (WHO), UNICEF is assisting in the preparation of information, education and communication (IEC) materials and in strengthening the sector monitoring system.

(2) Bilateral Agencies

The Japan International Cooperation Agency (JICA) extends technical cooperation in the basic design study for the Rural Environmental Sanitation Project (Phase III). This project, to be jointly implemented by DPWH and DOH, envisages the construction of Level I and II water systems and school toilet facilities in rural areas of ten (10) provinces through grants. With DPWH, rural water supply systems are being constructed at the evacuation centers for the Pinatubo refugees. JICA also supports the groundwater development study in Cavite province (with LWUA) and the institutional development activities at MWSS. JICA is providing the services of the Study Team preparing provincial sector plans in nine (9) provinces.

The Overseas Economic Cooperation Fund (OECF) is financing the RWS IV project through 1995. It provides a loan of up to Yen 5.08 B to counterpart funds of Pesos 400 M for the construction/rehabilitation of Level I systems, construction of workshop buildings and procurement of various equipment. OECF is supporting the Provincial Cities Water Supply Project of LWUA and the Angat Water Supply Optimization Project of MWSS.

The Australian International Development Assistance Bureau (AIDAB) is supporting the Central Visayas Water and Sanitation Project through a A$ 14.65 M grant. The project is implemented by the LGUs and the regional development council. Project components include: planning and monitoring information systems; infrastructure planning and rehabilitation; and institution building with an emphasis on community management based on experiences from other AIDAB-funded projects. The Project has been extended through 1997.

5.7 Current Community Development and Training Approaches

5.7.1 Community Development

The principal experience of the province on community mobilization for water and sanitation was with the former Barangay Water Program. The establishment of community-based organizations was done by PPDO following the guidelines set by the BWP-assisted program. The PPDO had organized the Caguray and Paluan Level II RWSAs; Tilik, Mamburao, and Lubang Level III RWSAs.

The CWs assist the community to identify their needs and problems, and consequently propose suitable and viable projects to be implemented in the community. The CWs also co-ordinate with different financial institutions to seek financial assistance for the proposed projects.

The province does not have a strong program of sustained interaction with the communities. Community development initiatives are almost always project-based.

5.7.2 Human Resources Development & Training

There are very few training activities organized by the province. The few programs which have been organized were on general management and administrative issues. The province acknowledges the need for improving the capabilities of its staff. At present, however, staff training in the province is done on an ad hoc basis. Each of the provincial offices is responsible for training of their staff. Many of the training activities attended by the staff are those organized by central agencies or projects. Training materials and other resources are thus scattered among the various provincial units and project offices making planning and monitoring problematic.

The Department of Health through Regional Health Office conducts rural sanitary inspector training/seminars on environmental health program; training of food handlers and food operators on food safety.

5.7.3 Sanitation/Hygiene Education

The health/hygiene education program of the PHO focuses mainly on intensification of information, education and communication campaign through inter-agency coordination and collaboration. In implementing the health education program on sanitation, the PHO utilizes the barangay health workers (BHWs), rural sanitary inspector, midwifes, rural health physicians, public health nurse and health-oriented NGOs in disseminating information to different communities. Various modes of dissemination are used, including radio announcements, press releases, film showing and community assemblies. Health educational materials from the central DOH consisting of posters, streamers, comics and stickers are used.

5.8 Existing Sector Monitoring

(1) National Level

The primary sources of sector data are the field office and staff of DPWH, DOH, LWUA, MWSS and NSO. Other agencies, including NEDA and LGUs, use data from these agencies. Each of these agencies runs its own project (or activity) monitoring systems largely based on required reports of its field offices. Current reporting requirements focus on physical accomplishments and capital expenditures. One serious shortcoming is the assumption that all constructed facilities are functioning and in use.

Apart from regular project monitoring, instructions are issued to conduct inventories of facilities (with actual status). The last completed inventory was done in 1990. These surveys are done in conjunction with sector or area planning studies. Only the NSO gathers and assesses information nationwide on a regular basis as part of its Census on Population and Housing (CPH). The CPH "long form" is administered on 10% of the households once every ten years. NSO plans to increase the CPH "short form" frequency to every five years. Water and sanitation is not included in the short form.

There is wide dissatisfaction among implementors themselves over the existing monitoring system. Monitoring report preparation is seen as a nuisance to performing one's job, and is thus haphazardly done. This leads to the problem of reliability of information coming from the field. There is a need to establish a system which is perceived as having a direct link to performance, similar to project-based monitoring.

(2) Local Level

Sector monitoring is done by PPDO. However, only those projects covered by Level I service are monitored. The monitoring system of the PPDO is primarily concerned with the procurement and delivery of inputs, and adherence to work schedules. Thus, the number of hand pumps delivered and installed in a barangay, and its status (functional or non-functional) normally appear in the monitoring and evaluation forms for water supply projects.

The evaluation and monitoring mechanism being practiced in the province is designed to find out if the goals and objectives of the projects are being achieved and if the project implementation policies have been closely followed. The evaluation and monitoring system includes an institutionalized reporting system relative to the project's progress and accomplishments. Feedback and comments on the proposed and implemented projects are also gathered.

Chapter 6

PAST FINANCIAL PERFORMANCE IN WATER SUPPLY AND SANITATION

6. PAST FINANCIAL PERFORMANCE IN WATER SUPPLY AND SANITATION

6.1 General

As discussed in Chapter 5, the new direction by the Local Government Code of 1991 and NEDA Board Resolution No. 4 (1994) mandated the LGUs to play a larger role in planning and implementing water supply and sanitation projects. As a result, locally funded projects and programs for the sector had been devolved from central government agencies to LGUs since 1992, although some projects are still on going by central government agencies. The Implementing Rules and Regulations (IRR) to effect the devolution of water and sanitation sector responsibilities and resources are under preparation.

In order to clarify the flow and contents of funds to the sector under this transitional period and to apply for the planning of financial arrangements, this chapter sets forth: (1) past public investment in the recent years to the sector by central government agencies and LGUs; (2) roles of the Internal Revenue Allotment (IRA); (3) cost recovery and financial performances of WDs/associations; and (4) affordability of users at present.

6.2 Past Public Investment

6.2.1 Past Public Investment by the Central Government Agencies and LGUs

The recent development of the water supply and sanitation sector in the province was mainly achieved by line agencies such as DPWH, LWUA, DILG and DOH as well as the provincial government, which is shown in Table 6.2.1.

Table 6.2.1 Previous Sector Investment to the Province by Concerned Agency

Unit: 1,000 Pesos

Funding Category		1989-93				
Agency	Funds	Level I	Level II	Level III	Sewerage	Sanitation
DILG	BWP			3,317		
DPWH	Foreign and local fund	13,186				
LWUA				4,215		
DOH		245				
Province	Provincial Government		150	6,150		100
Municipality	Municipal Government		120			
Others	Congressman's Office					80
	DECS					344
	LIUCP	30				
	OSCM	92				

Sources: Each central agency and PSPT of the provincial government
Note: (1) BWP: Barangay Water Program, (2) DECS: Department of Education, Culture and Sports
(3) LIUCP: Low Income Upland Communities Project and (4) OSCM: Office for Southern Cultural Minorities

Investments for Level I facilities by DPWH amounted to P 13,186 thousand during the period 1990 to 1992, covering 371 shallow wells, 140 deep wells, 12 spring development, 1 rain collector and 125 rehabilitation works. As locally funded projects were devolved to LGUs since 1992, investment plan of DPWH does not include any projects from 1993 onwards.

LWUA had released a total of P 4,215 thousand during the period 1990 to 1993 to improve and expand the water supply facilities of 2 Water Districts; Sablayan and San Jose WDs.

DILG financed a total of P 3,317 thousand during the period 1990 - 1992 for one Level III system at Mamburao under the Barangay Water Program (BWP).

DOH invested a total of P 245 thousand for Level I facilities. Under the FW4SP program, however, no investments were done to the province from 1990 to 1993.

The provincial government financed an amount of P 6,400 thousand for Level I and Level III facilities and toilets from 1989 to 1993. Municipal governments also disbursed a total amount of P 120 thousand for Level II facilities. As to the other sources of fund, the Congressman's Office, DECS, LIUCP and OSCM also invested to the sector.

6.2.2 Sources of Local Fund

According to the Local Government Code of 1991, 40% of the national internal revenue taxes of the 3rd fiscal year preceding the current year (from 1994 onwards) is allocated to LGUs nationwide, specifically to the administrative units of (1) province (23%), (2) city (23%), (3) municipality (34%), and (4) barangay (20%). Further, respective IRA in different administrative levels are allotted to all administrative units concerned according to the manner of calculation in terms of population, land area and other factors.

As shown in Table 6.2.2, IRA allotted to each province ranged from 0.7% to 0.9% of the national total IRA between 1990 and 1993. On the other hand, the total IRA to all municipalities of the province was arranged with 0.9 - 1.0 % to the national total IRA for nationwide municipalities(refer to Table 6.2.1, Supporting Report).

Table 6.2.2 Past Internal Revenue Allotment to the Province from Central Government

Unit: Pesos

		1990	1991	1992	1993
National	1. National Total of IRA *				
	(a) IRA to Provinces	2,031,174,331	2,697,482,707	4,571,136,402	8,445,600,000
	(b) IRA to Municipalities	3,054,601,475	4,046,838,742	7,127,522,550	12,484,800,000
Provincial	2. IRA to Occ. Mindoro Prov.*				
	(1) Total: (2)+(3)	47,481,980	62,437,431	121,649,439	217,281,960
	(2) Provincial Government	19,512,378	25,945,731	52,381,661	93,147,560
	Percentage of (a)	(0.96)	(0.96)	(1.15)	(1.10)
	(3) Municipalities	27,969,602	36,491,700	69,267,778	124,134,400
	Percentage of (b)	(0.92)	(0.90)	(0.97)	(0.99)
	3. Total Revenue of the				
	Percentage of IRA of	30,157,314	37,138,191	62,627,592	103,901,600
	Prov. Government	(64.70)	(69.86)	(83.64)	(89.65)
Municipalities	4. IRA to Municipalities **				
	Total	27,969,602	36,491,700	69,267,778	124,134,400
		(100.0)	(100.0)	(100.0)	(100.0)
	Abra de Ilog	2,074,795	2,616,615	5,426,364	9,693,969
		(7.4)	(7.2)	(7.8)	(7.8)
	Calintaan	1,853,752	2,454,998	4,875,078	8,616,129
		(6.6)	(6.7)	(7.0)	(6.9)
	Looc	790,419	964,293	2,331,793	3,942,832
		(2.8)	(2.6)	(3.4)	(3.2)
	Lubang	1,305,017	1,709,648	3,284,033	5,733,442
		(4.7)	(4.7)	(4.7)	(4.6)
	Magsaysay	1,835,912	2,408,731	4,594,113	8,122,978
		(6.6)	(6.6)	(6.6)	(6.5)
	Mamburao (Capital)	1,876,259	2,586,727	4,872,567	8,621,480
		(6.7)	(7.1)	(7.0)	(6.9)
	Paluan	2,951,131	2,840,559	5,176,736	9,240,306
		(10.6)	(7.8)	(7.5)	(7.4)
	Rizal	1,859,621	2,438,295	4,399,568	7,760,575
		(6.6)	(6.7)	(6.4)	(6.3)
	Sablayan	6,473,232	8,788,503	17,623,463	32,265,077
		(23.1)	(24.1)	(25.4)	(26.0)
	San Jose	4,808,408	6,636,803	10,149,882	18,412,721
		(17.2)	(18.2)	(14.7)	(14.8)
	Sta. Cruz	2,141,056	3,046,528	6,534,181	11,724,891
		(7.7)	(8.3)	(9.4)	(9.4)

Sources: (1) Department of Budget and Management, (2) Bureau of Local Government Finance (MOF) and (3) Provincial Annual Report (1993)

Notes: *IRA to barangays is not included. ** Figures in bracket are shares (%) in the total of all municipalities in the province.

For the provincial government, the IRA was the most important financial source of the total revenue. IRA accounts for 65 - 80 % of the total revenue of the provincial government during 1990 and 1992. A large part of investments financed by LGUs to the water and sanitation sector, therefore, was coming from the IRA. The expenditures of the provincial government for the relevant sector in 1994 were reported at P 2,525 thousand, about 2.7% of the IRA.

As for municipality, distribution share to each municipality in the province was within a certain range between 1990 and 1993. Sablayan and San Jose had the larger share compared with other municipalities in the province.

6.3 Cost Recovery

The capital cost for Level I systems is free to the community, while operation and maintenance is the responsibility of the associations. As for Level II systems, the capital cost is shouldered by the RWSA through a loan or grants. Water charges collected by each association cover cost of operation and maintenance, and loan amortization. According to the Loan Department of LWUA, the new loan disbursement to RWSAs has been stopped for the last couple of years.

For Level III system, WDs or RWSAs bear the entire capital cost financed by LWUA through loans with concessional terms of 8.5% - 12.5% interest rate and repayment period extending up to 30 years. Less capable WDs are granted to receive soft loans which are interest free during the first 5 years of operation. At the initial time, 100% of the total investment will be covered by a loan. After the second time or more, 90 % will be granted by a loan and 10% will be by equity. The cost of amortizing the loan and operation and maintainance of the system is recovered through monthly water bills. Details of financial performance with cost recovery is discussed in section 6.5.

Regarding the sanitation sector, toilet bowls have been distributed to households without charges, although construction of the superstructure and the depository of household toilets is through self-help.

6.4 Affordability

Table 6.4.1 indicates the affordability by level of sector service. At present, the current water bills in the province seem to be within an affordable range based on the experiences, although actual income is different from municipality to municipality and barangay to barangay.

On the other hand, construction cost of household toilet seems to be expensive comparing with the family income. If users pay a 5% of the monthly family income, the total costs shall be amortized with a period of more than 22 months. Therefore, subsidy from LGUs may be necessary.

Table 6.4.1 Affordability in Water and Sanitation Services

Income / Level of Services	Amount (Peso)	% to Monthly Income	Affordable Range (%) 5)
Median of Monthly Income 1)	4,168	100.0	-
Average Level III: Monthly Water Bill 2)	94	2.3	5.0 or less
Average Level II: Monthly Water Bill 3)	30 - 60	0.7 - 1.4	2.0 - 3.0
Mo. Level I Expenditure 3)	5 - 10	0.1 - 0.2	1.0 or less
Private Toilet Construction Cost 4)	4,700	-	-

Notes:
1) 1991 Family Income and Expenditures Survey, NSO
(Median of the provincial figure is inflated to 1994 prices.)
2) LWUA, (As of April 1994). It is assumed that 20 m^3 will be used per family.
3) Common figures in the province
4) First Stage Feasibility Report for Sanitation and Sewerage, Dagupan, 1993, WB
(The figure is inflated to 1994 prices.)
5) Based on the experiences mainly from LWUA, DPWH and DILG

6.5 Past Financial Performance of WDs and RWSAs/BWSAs

There are 2 water districts in Occidental Mindoro. Table 6.5.1 shows the financial indicators of these water districts in 1994. Operation and maintenance costs of these WDs exceeded the revenues. To raise water rates within an appropriate range is one of the solutions in view of the cost recovery.

Loan status of these WDs are shown in Table 6.5.2. At present, they have received loans of ₱ 7,462 thousand from LWUA. Sablayan WD is in arrears.

Most of the facilities managed by RWSAs and BWSAs were constructed under grant conditions by central government agencies and LGUs with the recipient providing some equity contribution in the form of materials or labor. The associations are responsible for the operation and maintenance of the systems, but financial performance of the associations

tends to face difficulties partly because the beneficiaries do not recognize the cost requirements, although there is no systematic reporting by RWSAs and BWSAs.

Table 6.5.1 Financial Indicators of Water Districts

Water District	Descriptions						
	No. of Metered Connections Nos.	No. of Flat Rate Connections Nos.	Average Monthly Rate Pesos/cu.m.	Average Consump. per Conn. cu.m./mo.	Average O&M Costs Pesos/mo.	Average Revenue Pesos/mo.	Collection Efficiency Percent (%)
Sablayan	455	12	5.84	17.00	101,496	5,744	96
San Jose	2,246	1	5.24	24.94	332,261	62,290	99

Source: IDS, LWUA

Table 6.5.2 Loan Status of Water Districts

Water District	Descriptions			
	Total Loan Availed 1000 Pesos	Remaining Payment Period 1) Months	Average Monthly Amortization Pesos	Current Arrears Pesos
Sablayan	3,256	303	22,524	347,334
San Jose	4,206	284	32,029	0

Source: Loans Operation Dept., LWUA (As of August 30, 1994)

Note: 1) The longest remaining payment period among several loans is indicated.

Chapter 7

WATER SOURCE DEVELOPMENT

7. WATER SOURCE DEVELOPMENT

7.1 General

Water source development study was made covering the entire province to come up with a "Groundwater Availability Map" to identify available potable water sources. An emphasis has been placed on groundwater sources rather than surface water based on current practices and assessment of the groundwater potential in the province.

The study entailed two major components: (1) clarification of existing geological conditions and groundwater situation, and (2) preparation of Groundwater Availability Map to show groundwater potential under three kinds of categorized areas. Standard well specifications by municipality are also studied for the reference of water supply plan.

The major bases for the study are the data and reports prepared by concerned agencies (NAMRIA, BMGS, NWRB, LWUA, DPWH and PPDO) supplemented by collected data in the province through this study. Among the effective information, Groundwater Resource Survey Report by BMGS, Water Resource Investigation Report by NWRB and Well Inventory Database by NWRB are essential for the analysis of geological characteristics, projection of high yielding area and possible area of salt water intrusion, and classification of groundwater potential, respectively.

The Groundwater Availability Map may be used for provincial level master plan at present. However, updating the map is a requisite to increase individual well information using the questionnaire form prepared for the study. Annual review and updating of the data will enable the LGUs to implement water source development on a project site basis.

Database in the province confirmed existing groundwater sources and conditions as summarized in Table 7.1.1 (Data by municipality are included, 7.1.1 Water Source Information, Data Report). During the study period, 27,659 shallow wells, 525 deep wells and 37 springs were reported. Of the total shallow wells, 27,126 or 98 percent of the provincial total were privately owned. Water quality problem was identified with 37 percent of the total wells, while the number of non-functioning wells was negligible. The number of untapped springs was found tobe 11, mome of which may be utilized for water supply.

Table 7.1.1 Existing Groundwater Source in the Province

No.	Data Description	Shallow Well	Deep Well	Spring	Total
1	Number of water source	27659	525	37	28221
2	Profile of different Sources	98.01	1.86	0.13	100
3	Owned by Government Agency	533	525	34	1092
4	Privately owned	27126	0	3	27129
5	Sources with a quality problem	10089	229	21	10339
6	Non-functional wells	395	427		822
7	Untapped springs			11	11

7.2 Geology

The geologic rock units observed in the province have been categorized into three (3) main groups based on the ages of the different rock formations: Pliocene and Older rock units; Pleistocene to Pliocene rock units; and Recent Deposits. Boundaries between these rock groups are shown in the Geological Map of the Province (refer to Figure 7.2.1).

(1) Pliocene and Older rock units

Mindoro Island is dominated by a broad expanse of basement complex rocks. The basement rocks consisting of schist and quartzite are exposed on the north and south eastern portionsof Occidental Mindoro, which cover about 50%. In some part of the areas, the basement complex is overlain by younger volcanic rocks. Groundwater potential is low under these consolidated rock units.

(2) Pliocene to Pleistocene

Sedimentary deposits of the Pliocene to Pleistocene age comprised about 20% of the rocks underlying the province. They cover low land areas from Sablayan towards the southern section of the province. The rock units consist of marine and terrestrial sediments associated with extension of reef limestone and sporadic terrace deposits. The rock units are generally less consolidated providing good groundwater sources. The low land area such as Sablayan area is a potential area for groundwater development under these rock units by means of deep wells.

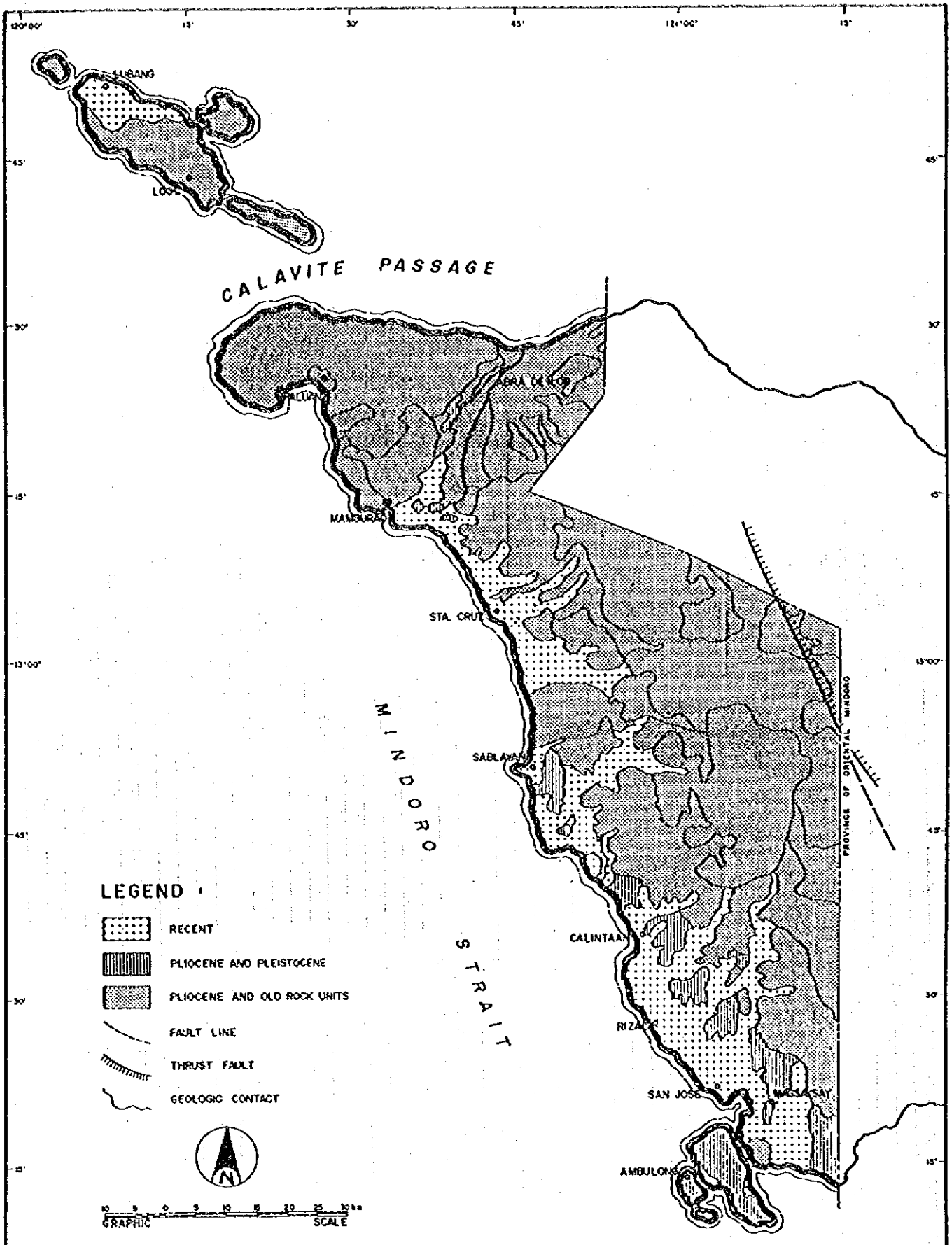


FIGURE 7.2.1
GEOLOGICAL MAP

(3) Recent Deposits

The Recent deposits cover about 30% of the total land area of the province. They are found along the coastal and flood plains such as in San Jose, Magsaysay Rizal, Calintaan, Sta. Cruz, Mamburao and Sablayan. The formation consists mainly of clay, silt, sand and gravel deposit. These unconsolidated deposits have potential groundwater both in shallow and deep aquifers.

7.3 Groundwater Sources

7.3.1 Classification of Groundwater Sources

For planning purpose, the provincial area is divided into the following sub-areas in terms of groundwater availability.

(1) Shallow well area

Generally, there exists Recent deposit in the shallow well area underlain by basement rock units or impervious formation, where alluvial deposits exist covering river flood plains, valleys and coastal areas. The extent of sole shallow well areas is limited, because most Recent formation is underlain by Pleistocene and Late Pliocene formations where the deeper aquifer commonly exists.

(2) Deep well area

Deep aquifers may be available under Recent to Pleistocene, and Pliocene pervious and semi-pervious formations. In most of these areas, several aquifers are available, including those for shallow well development.

(3) Difficult area

The area falls in Pliocene and older rock units. Groundwater availability is very low in the area.

The potential areas with a high yield from deep aquifers and a problem of salt water intrusion are also presented based on NWRB's well database (geo-resistivity survey) and water quality examination results at some wells.

7.3.2 Groundwater Availability in the Province

The Groundwater Availability Map is presented in Figure 7.3.1. The major database used were prepared by BMGS and NWRB. The methodology and study processes with respective outputs are included in 7.3, Supporting Report. Technical information on the wells by municipality is also shown in the same Report.

(1) Shallow well area

Lubang and Ambulong islets are categorized as shallow well areas. Wells are generally driven/drilled with an average depth of 10 mbgl and the water level is more or less 3 mbgl. Average specific capacity is estimated at about 1.0 l/sec/m (affected by data of Looc, Lubang and San Jose). Although a limited number of deep wells exists in the area with static water level below 10 mbgl, the chances to hit productive wells are minimal due to geological conditions. The wells along the seashore are exposed to salt water intrusion problems.

(2) Deep well area

The deep well area covers approximately 20 % of the province. The alluvial flats occurring between Magsaysay and Calintaan, and the low lying areas from Sablayan to Santa Cruz have a high potential for deep well development. Average depth of existing wells is 56 mbgl with the average water table of 7.7 mbgl and specific capacity of 1.0 l/sec/m.

(3) Difficult area

About 80 % of the provincial area is classified as difficult area to exploit groundwater for water supply. Groundwater in the area is generally scarce and the chances to hit productive wells are low. These areas are hilly and mountainous and are located mainly on the south-eastern portion of the province as part of the Mindoro mountain ranges. It is underlain by complex mix of igneous and metamorphic rocks which are dense, massive, and impervious in character.

(4) Water quality of groundwater

The groundwater is generally potable, except in some areas with high contents of iron and manganese, and salinity. Water resource investigation for the province conducted by NWRB revealed problem areas with respect to water quality as follows:

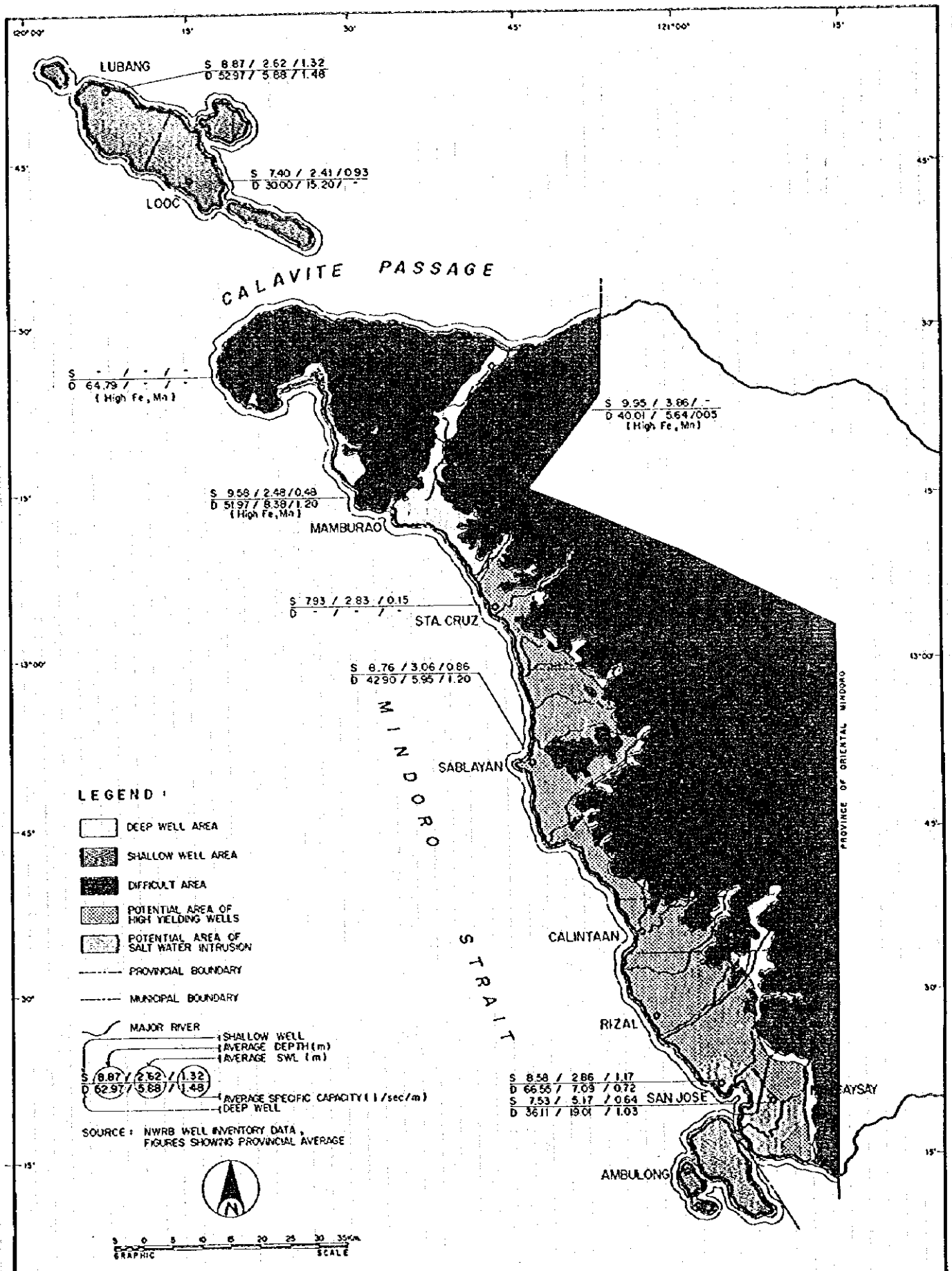
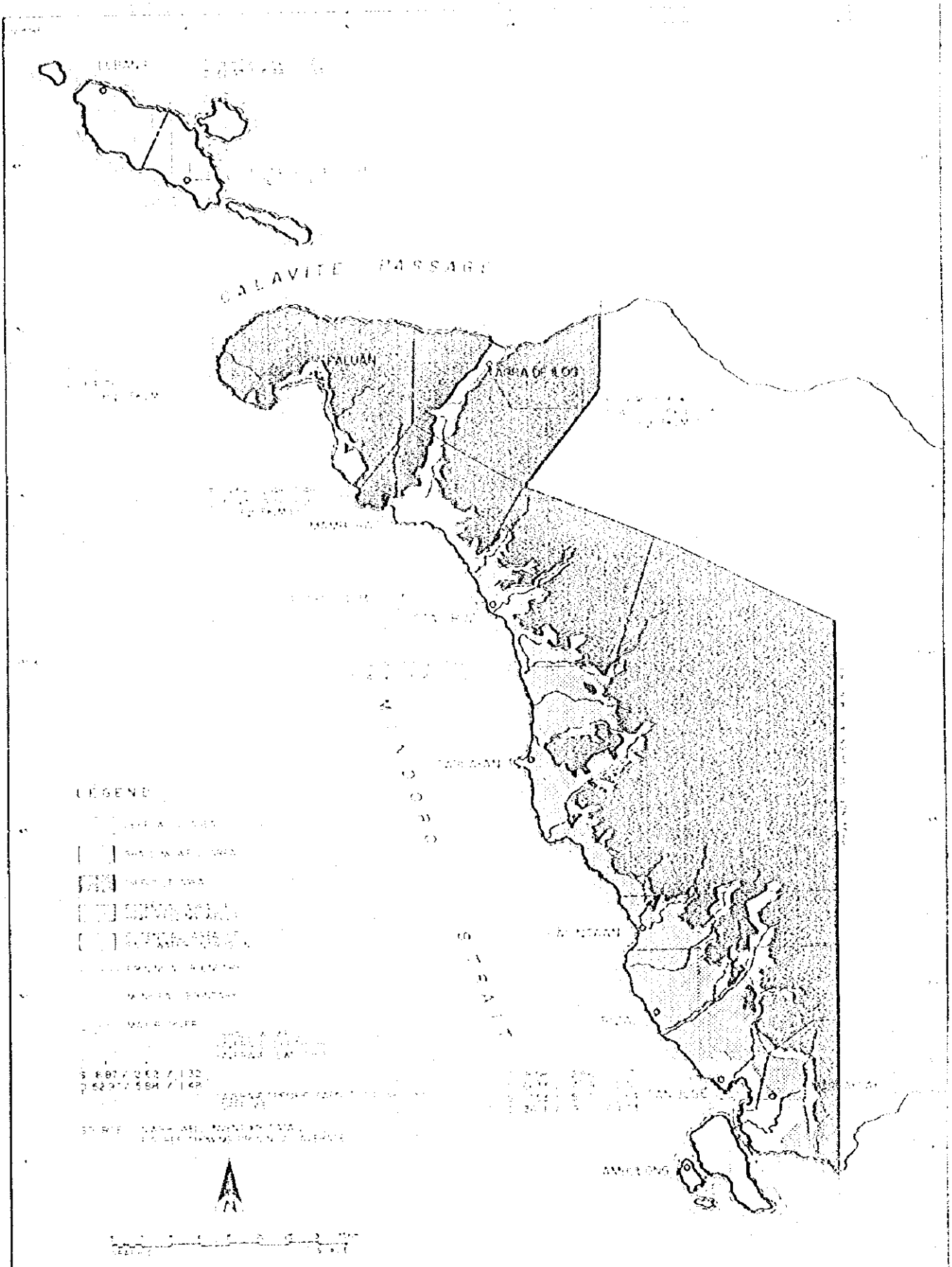


FIGURE 7.3.1

GROUNDWATER AVAILABILITY MAP



GROUNDWATER AVAILABILITY MAP

1) Possible area of salt water intrusion

High salinity is identified at some shallow wells in San Jose, Magsaysay, Lubang and Mamburao. In addition, geo-electric survey revealed that the seashore along Mangarin Bay is a possible area of salt water intrusion.

2) Iron and manganese problem area

Some deep and shallow wells in Mamburao, Abra De Ilog and Paluan have a problem with high iron and manganese content. The problem of the groundwater is caused by the continuous erosion of the iron-copper rich Limestone Formation (contact metamorphosed ore deposit) at Mount Burnrungan area.

The possible areas of salt water intrusion, and high iron and manganese contents are indicated in the Groundwater Availability Map.

7.4 Spring Sources

Spring is a natural outlet of groundwater at the surface of the ground. It occurs when the water table intersects the ground surface through contacts of pervious and impervious rock formations and along fractures of consolidated rock units. There is favorable environment for the development of spring in the province because of the presence of mountain ranges and highlands covered by Pleistocene and older rock units and complex faulting systems, as well as the existence of limestone rocks and permeable materials between volcanic rock.

A number of springs exists in most of the municipalities; Abra De Ilog, Calintaan, Looc, Lubang, Magsaysay, Mamburao, Paluan, Sablayan, San Jose and Santa Cruz. Untapped springs to be used for water supply are listed in Magsaysay, Paluan and Santa Cruz. The yields of existing springs range from 1.7 to 21.6 cu.m/hr. Technical information on the spring by municipality is presented in Table 7.4.1, Supporting Report.

7.5 Surface Water Sources

The province has several major rivers namely: Amnay, Busuanga, Caguray, Mamburao, Mongpong and Patrick Rivers. Drainage systems generally flow westward and empty into the China sea. Minimum flow rates recorded range from 5.9 to 1.7 cu.m/sec. Drainage areas for

the larger river basins vary from 434 to 136 km^2. Current use of river water is primarily for irrigation.

Water quality analysis of Busuanga and Caguray rivers, comparatively large rivers in the province, was conducted to determine the water quality of surface water in the province. River water was found to be turbid with some color and high iron contents (refer to 7.5, Water Quality Analysis Results, Supporting Report and Table 7.5.1, Data Report). Based on the examination results, both river water fall under Classification A of water quality criteria for fresh waters. It will require complete treatment for the use of water supply.

7.6 Future Development Potential of Water Sources

Based on the study of existing water sources, groundwater was identified as a safe and economical source for the water supply of the province.

Shallow wells are the most economical sources for Level I service. However, the yields of these wells are affected by the lowering of water table during dry season and exposed to the danger of bacteriological contamination.

Deep well sources are generally safe and stable in quantity with a provision of appropriate technology for the development. Additional wells should be developed taking into account water quality problem and hydrogeological conditions entailing detailed survey.

Groundwater Availability Map as shown in Figure 7.3.1 presents basic information for the municipalities with available data; average depth, static water level and specific capacity. For planning purpose, potential water sources and their specifications by well type for the municipalities are further tabulated as shown in Table 7.6.1, Supporting Report.

Some springs may be used for rural water supply in the areas of Paluan, Magsaysay and the islets like Ambulong, Ilin, Lubang and Looc. Prior to spring development, supplementary studies should be conducted to determine the effect of seasonal fluctuation of the discharge rate. In the islets, an attention should be paid that the elevation of spring out-let is generally lower than service area requiring pump facilities.

Chapter 8

FUTURE REQUIREMENTS IN WATER SUPPLY AND SANITATION IMPROVEMENT

8. FUTURE REQUIREMENTS IN WATER SUPPLY AND SANITATION IMPROVEMENT

8.1 General

Phased investments for provincial sector development are planned in the same manner as adopted in the National Sector Master Plan (NSMP); Medium-Term Investment covering the years 1996 to 2000 and Long-Term Development covering the period 2001 to 2010.

Targets of provincial service coverage for the two phases are established as percentages of beneficiaries or utilities to be served by sub-sector. Service coverage in the base year (1994) and national sector targets indicated in the NSMP and the Medium-Term Philippine Development Plan (MTPDP) are the bases of the study. Sector targets which are not prescribed in the national plan; school and public toilets as well as sewerage are assumed based on the current conditions. In addition, preliminary discussions on solid waste management are included as a vital component of sanitation sector.

Projection of frame values by municipality is undertaken for respective sub-sectors; future population by urban and rural area, the number of student enrollment to public schools and the number of public utilities. Base figures for the study of framework are referred to the 1990 Census of Population and Housing and the statistical data of the province and information from relevant agencies. NSO projection is employed for municipal population at the target years and base year (1994), while population distribution to urban and rural areas prepared by NSO in 1990 is modified to meet actual conditions in the classification of the areas.

Types of required facilities and their implementation criteria according to service level standards are referred to the said Master Plan. Some planning conditions and assumptions not prescribed in the national plan are conferred to the relevant standards of sector agencies and provincial government. For sewerage requirements, the deficit in sanitation must first be addressed. Partial upgrading of on-site disposal to a sewerage system (off-site disposal) is envisaged in the final target year.

In estimating future requirements by municipality, additional population (or number of students/public utilities) to be served by sub-sector is first calculated as a shortfall at target years in comparison between target and base year service coverage. In this regard, planned/on-going

projects to be completed by 1995 are considered as part of base year service coverage. Required number of facilities by sector component is then estimated corresponding to the said additional population (or number of students/public utilities) to be served. Rehabilitation work for Level I facilities limited to new deep wells to be constructed under PW4SP is taken into account. Generally, rehabilitation of deep wells and shallow wells constructed by means of conventional method is difficult.

Logistic support is considered as a minimum requirement of LGUs for community development and training, and other relevant activities along with the implementation of PW4SP. The types and number of well drilling/rehabilitation equipment and supporting vehicle for Level I facilities are also suggested as reference information.

Project priority for medium-term development is discussed entailing general criteria to identify specific projects. However, at the provincial level master plan, municipal priority ranking is rather suggested to be used for allocation of provincial fund.

8.2 Targets of Provincial Sector Plan

Provincial sector targets for the year 2000 and 2010 are determined as the provincial average of the desirable minimum level for each sub-sector. Table 8.2.1 summarizes the target percentages to be served by sub-sector. Details by sub-sector are discussed in this sub-section.

(1) Water supply

The base year service coverage was calculated as a total of those in 1994 and expected by planned/on-going projects scheduled to be completed by 1995. Table 8.2.2 shows service coverage for the planning purpose (details are referred to Supporting Report).

The base year service coverage in both urban area (70%) is almost the same as the MTPDP sector target (71%) for the year 2000, while rural area (44%) is far behind the sector target of 85%. As identified in Chapter 4, the lower service coverage in rural area is caused by the presence of a large number of unsafe sources/facilities and/or no provision of water supply facilities.

Considering the existing conditions, water supply sector targets were determined by urban and rural area. Phase I development shall be focused on the bottom up of rural water supply to a moderate target of 71% (urban water supply target of MTPDP), while

in urban area, 77% of the NSMP target is adopted. Phase II targets are planned to increase both urban and rural water supply coverages to 93% and 95%, respectively as envisaged in the NSMP.

Table 8.2.1 Provincial Sector Targets

		Phase I (1996-2000)		Phase II (2001-2010)	
Water Supply		Population Coverage (%)	Additional Population to be Served	Population Coverage (%)	Additional Population to be Served
Urban Water Supply		77	24,734	93	73,983
Rural Water Supply		71	76,826	95	95,026
Sanitation		Households Coverage (%)	Additional Households to be Served	Households Coverage (%)	Additional Households to be Served
Household Toilet		77	13,417	94	47,828
Urban	Flush	28	2,045	50	12,029
	Pour Flush	70	2,922	50	4,767
	VIP	2	330	0	0
Rural	Flush	8	287	10	337
	Pour Flush	90	7,166	90	30,695
	VIP	2	666	0	0
School Toilet		Coverage (%)	Additional Public School Students to be Served	Coverage (%)	Additional Public School Students to be Served
		30	10,285	50	24,037
Public Toilet		Coverage (%)	Additional Public Utilities with Sanitary Toilets	Coverage (%)	Additional Public Utilities with Sanitary Toilets
		50	14	100	12
Sewerage		Not Applicable		Coverage (%)	Population to be Served
				50	51,438
Solid Waste		Coverage (%)	Additional Households to be Served	Not Applicable	
		50	6,308		

Table 8.2.2 Base Year Service Coverage of Water Supply

Municipalities		Population (1994)	Population Served by 1994 Facilities				
			Level III	Level II	Level I	Total	% Coverage
Abra de Ilog	Urban	1,733	1,354	0	49	1,403	81
	Rural	11,894	118	118	140	376	3
	Total	13,627	1,472	118	189	1,779	13
Calintaan	Urban	6,024	0	0	4,806	4,806	80
	Rural	13,763	0	0	9,786	9,786	71
	Total	19,787	0	0	14,592	14,592	74
Looc	Urban	2,511	0	0	17	17	1
	Rural	4,836	0	0	0	0	0
	Total	7,347	0	0	17	17	0
Lubang	Urban	6,245	3,731	0	0	3,731	60
	Rural	14,292	1,695	0	0	1,695	12
	Total	20,537	5,426	0	0	5,426	26
Magsaysay	Urban	7,346	1,316	102	917	2,335	32
	Rural	16,247	324	0	2,939	3,263	20
	Total	23,593	1,640	102	3,856	5,598	24
Mamburao (Capital)	Urban	12,287	8,952	235	292	9,479	77
	Rural	12,141	0	0	669	669	6
	Total	24,428	8,952	235	961	10,148	42
Paluan	Urban	3,866	0	1,848	534	2,382	62
	Rural	4,045	0	0	747	747	18
	Total	7,911	0	1,848	1,281	3,129	40
Rizal	Urban	0	0	0	0	0	0
	Rural	25,819	0	0	19,970	19,970	77
	Total	25,819	0	0	19,970	19,970	77
Sablayan	Urban	12,654	5,804	0	5,263	11,067	87
	Rural	38,874	178	561	23,598	24,337	63
	Total	51,528	5,982	561	28,861	35,404	69
San Jose	Urban	34,212	12,334	187	12,211	24,732	72
	Rural	63,208	0	345	29,350	29,695	47
	Total	97,420	12,334	532	41,561	54,427	56
Sta. Cruz	Urban	3,267	2,587	0	680	3,267	100
	Rural	15,183	1,118	0	4,964	6,082	40
	Total	18,450	3,705	0	5,644	9,349	51
Provincial Total	Urban	90,145	36,078	2,372	24,769	63,219	70
	Rural	220,302	3,433	1,024	92,163	96,620	44
	Total	310,447	39,511	3,396	116,932	159,839	51

(2) Sanitation

1) Household toilets

As with water supply, the base year service coverage is calculated as shown in Table 8.2.3 reflecting any planned or on-going projects to be completed by 1995 (details are referred to Supporting Report).

Table 8.2.3 Base Year Service Coverage of Household Toilets

Municipality	Type	1994		Households and Population Using Sanitary Toilets								
				Number of Households					Coverage (%)			
		Population	No. of HHs	Flush	Pour Flush	VIP Latrine	Total	Served Population	Flush	Pour Flush	VIP Latrine	Total
Abra de Ilog	Urban	1,733	361	141	159	0	300	1,438	39	44	0	83
	Rural	11,894	2,531	13	1,123	0	1,136	5,352	1	44	0	45
	Total	13,627	2,892	154	1,282	0	1,436	6,814	5	44	0	50
Calintaan	Urban	6,024	1,095	0	731	0	731	4,036	0	67	0	67
	Rural	13,763	2,647	0	2,060	0	2,060	10,735	0	78	0	78
	Total	19,787	3,742	0	2,791	0	2,791	14,840	0	75	0	75
Looc	Urban	2,511	584	0	345	0	345	1,481	0	59	0	59
	Rural	4,836	1,008	0	879	0	879	4,207	0	87	0	87
	Total	7,347	1,592	0	1,224	0	1,224	5,657	0	77	0	77
Lubang	Urban	6,245	1,419	424	635	0	1,059	4,684	30	45	0	75
	Rural	14,292	2,917	173	1,899	0	2,072	10,147	6	65	0	71
	Total	20,537	4,336	597	2,534	0	3,131	14,787	14	58	0	72
Magsaysay	Urban	7,346	1,440	129	1,173	0	1,302	6,611	9	81	0	90
	Rural	16,247	3,009	30	1,943	0	1,973	10,723	1	65	0	66
	Total	23,593	4,449	159	3,116	0	3,275	17,459	4	70	0	74
Mamburao(Capital)	Urban	12,287	2,508	755	945	0	1,700	8,355	30	38	0	68
	Rural	12,141	2,381	0	1,616	0	1,616	8,256	0	68	0	68
	Total	24,428	4,889	755	2,561	0	3,316	16,611	15	52	0	68
Paluan	Urban	3,866	805	0	168	285	453	2,165	0	21	35	56
	Rural	4,045	879	0	180	141	321	1,497	0	20	16	37
	Total	7,911	1,684	0	348	426	774	3,639	0	21	25	46
Rizal	Urban	0	0	0	0	0	0	0	0	0	0	0
	Rural	25,819	4,965	0	3,054	0	3,054	16,008	0	62	0	62
	Total	25,819	4,965	0	3,054	0	3,054	16,008	0	62	0	62
Sablayan	Urban	12,654	2,388	500	983	0	1,483	7,845	21	41	0	62
	Rural	38,874	7,622	18	4,895	0	4,913	24,879	0	64	0	64
	Total	51,528	10,010	518	5,878	0	6,396	32,978	5	59	0	64
San Jose	Urban	34,212	6,579	1,010	4,039	0	5,049	26,343	15	61	0	77
	Rural	63,208	11,926	0	9,123	0	9,123	48,038	0	76	0	76
	Total	97,420	18,505	1,010	13,162	0	14,172	75,013	5	71	0	77
Sta Cruz	Urban	3,267	583	0	424	0	424	2,385	0	73	0	73
	Rural	15,183	2,865	0	1,277	645	1,922	10,173	0	45	23	67
	Total	18,450	3,448	0	1,701	645	2,346	12,546	0	49	19	68
Provincial Total	Urban	90,145	17,762	2,959	9,602	285	12,846	64,904	17	54	2	72
	Rural	220,302	42,750	234	28,049	786	29,069	149,805	1	66	2	68
	Total	310,447	60,512	3,193	37,651	1,071	41,915	214,208	5	62	2	69

The province has a base year service coverage of 69%, which is below the current national average coverage of 77%. Urban area registers a level of 72% that is close to the national average coverage. Rural area however, has only 68% considering the numerous unsanitary facilities. By type of sanitary toilet facility, the existing percentage composition to total households is as follows:

Type	Urban (%)	Rural (%)
Flush	17	1
Pour-flush	54	66
VIP latrine	2	2

To lessen the gap of the service coverage between the urban and rural area and to attain an equitable distribution of this basic facility, the same targets are applied to both areas. Provincial target of Phase I for household toilets is planned to be 77%, which is the current national average coverage. For Phase II, 94% as set by the NSMP is adopted.

The existing composition of the 3 facility types serves as an indicator in the distribution for Phase I, while for Phase II, VIP latrine is phased-out.

2) School toilets

The base year service coverage of public school students is shown in Table 8.2.4 counting expected coverage of any planned or on-going projects to be completed by 1995 (details are referred to Supporting Report).

Table 8.2.4 Base Year Service Coverage of Public School Toilets and Public Toilets

Municipality	Public School Toilets			Public Toilets		
	1994 Total No. of Public School Students	Std. No. of Public School Students that can be Served by Base Year (1994) Sanitary Toilets	Coverage (%)	Number of PU with Toilets in 1994	Number of PU with Sanitary Toilets in Base Year (1994)	Coverage (%)
Abra de Ilog	2,207	800	36	1	0	0
Calintaan	4,194	900	21	0	0	0
Looc	1,596	450	28	0	0	0
Lubang	3,258	750	23	1	1	100
Magsaysay	6,663	1,500	23	0	0	0
Mamburao (Capital)	5,920	900	15	2	0	0
Paluan	2,120	600	28	1	0	0
Rizal	5,600	750	13	0	0	0
Sablayan	4,587	700	15	1	1	100
San Jose	14,421	2,700	19	1	0	0
Sta. Cruz	4,403	700	16	1	0	0
Provincial Total	54,969	10,750	20	8	2	25

Note: PU - Public Utilities

Present service coverage is 20% applying the standard number of public school students to be served by one (1) unit of toilet facility. The very low level is due to a large number of unsanitary or absence of facilities.

In the absence of national targets for school toilets, the existing level of service coverage is the base in setting up the targets. For Phase I and II, 30% and 50% are set, respectively.

3) Public toilets

The base year service coverage considering expected additional coverage by 1995 is shown in Table 8.2.4 (details are referred to Supporting Report).

Only 25% of the existing public utilities is served with sanitary toilets. This can be attributed by the fact that majority of the public utilities (mostly public markets) are not provided by sanitary toilet facilities.

In setting up the targets without national targets as of now, the indicator would be the existing level of coverage. It is expected that all new construction of public utilities will entail sanitary toilets enabling the coverage to increase on a high level. Accordingly, a 50% coverage for Phase I and a 100% coverage for Phase II are assumed.

(3) Sewerage

Given the non-existence of sewerage systems in any municipality at the present time, this plan does not consider the service during Phase I. For Phase II, a target of 50% coverage was applied to urban population of municipalities with more than 10,000 urban population provided by Level III water supply systems.

(4) Solid waste

The municipal level data in 1994 on the number of households served by the municipal refuse collection revealed that the current practice is limited to only urban areas. The base year service coverage for urban area by municipality is reflected in Table 8.2.5.

A mere 10% of the total households in the province relied on municipal refuse collection using trucks or a 33% urban household coverage. These municipalities have a total of 2 units of collection truck.

No national targets have yet been set. However, considering the present level of coverage, a 50% urban household coverage is applied for the medium-term period (2000).

Table 8.2.5 Base Year Service Coverage of Municipal Solid Waste System in 1994

Municipality	Total No. of Households	No. of Urban Households	No. of House-hold Served*	Coverage of Households (%)	Coverage of Urban HHs (%)
Abra de Ilog	2,892	361	0	0	0
Calintaan	3,742	1,095	0	0	0
Looc	1,592	584	0	0	0
Lubang	4,336	1,419	0	0	0
Magsaysay	4,449	1,440	0	0	0
Mamburao (Capital)	4,889	2,508	1,085	22	43
Paluan	1,684	805	0	0	0
Rizal	4,965	0	0	0	0
Sablayan	10,010	2,388	0	0	0
San Jose	18,505	6,579	4,840	26	74
Sta. Cruz	3,448	583	0	0	0
Provincial Total	60,512	17,762	5,925	10	33

Note: * - Equivalent to total number of urban households served.

8.3 Projection of Frame Values

8.3.1 Population Projection

Future population for all municipalities by urban and rural area was projected for the target years of 2000 and 2010 together with the present population in 1994 as a planning base year.

Reference figures used for the study were the population census data of 1980 and 1990, and the future population projected by NSO at different administrative levels; region, province and municipality with breakdown to urban and rural areas.

The study was carried out in the following manner (details are included in Supporting Report).

(1) Review of past population development including 1990 population distribution to urban and rural areas.

(2) Review of NSO projection both in total population and annual growth rate at regional, provincial and municipal levels.

(3) Review of population distribution (NSO projection) to urban and rural areas at municipal level in comparison with 1990 population distribution.

The past population development during the census period from 1980 to 1990 revealed that:

- The province recorded 2.4% of annual growth rate lower than that of the region at 3.1%.
- Percentage of provincial population to the regional population decreased from 3.6% in 1980 to 3.4% in 1990, although rural population percentage increased.

The future population may therefore remain under similar conditions as experienced in the last census decade, unless specific development takes place in the province.

Through the review of NSO projection, it was confirmed that:

- Total population of the province and its growth rates by target year reflect the trend of past population development.
- Municipal population is also within the range of the past population development (moderate increase of population).

However, municipal population distribution to urban and rural areas was adjusted corresponding to reclassification of some barangays as identified for the year 1990.

Population by target year and in 1994 is presented in Table 8.3.1 covering all municipalities broken down to urban and rural areas. Number of households by target year was also studied and included in Table 8.3.5, Supporting Report.

Table 8.3.1 Future Population by Urban and Rural Area by Municipality

Municipality	1990			1994			2000			2010		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Abra de Ilog	1,680	11,929	13,609	1,733	11,894	13,627	1,816	11,839	13,655	2,333	13,979	16,312
Calintaan	5,280	12,837	18,117	6,024	13,763	19,787	7,340	15,244	22,584	9,632	17,347	26,979
Looc	1,684	5,353	7,037	2,511	4,836	7,347	4,570	3,268	7,838	6,966	2,397	9,363
Lubang	5,717	13,083	18,800	6,245	14,292	20,537	7,131	16,318	23,449	8,519	19,494	28,013
Magsaysay	6,584	14,996	21,580	7,346	16,247	23,593	8,658	18,312	26,970	10,857	21,361	32,218
Mamburao (Capital)	11,414	10,367	21,781	12,287	12,141	24,428	13,723	15,290	29,013	14,626	20,034	34,660
Paluan	3,207	4,342	7,549	3,866	4,045	7,911	5,117	3,369	8,486	6,620	3,517	10,137
Rizal	0	23,379	23,379	0	25,819	25,819	2,485	27,479	29,964	2,969	32,826	35,795
Sablayan	9,786	36,760	46,546	12,654	38,874	51,528	18,605	41,412	60,017	29,395	42,301	71,696
San Jose	30,735	56,785	87,520	34,212	63,208	97,420	40,178	74,231	114,409	47,996	88,676	136,672
Sta. Cruz	2,602	14,073	16,675	3,267	15,183	18,450	4,595	16,879	21,474	5,028	20,625	25,653
Provincial Total	78,689	203,904	282,593	90,145	220,302	310,447	114,218	243,641	357,859	144,941	282,557	427,498

8.3.2 School Enrollment Projection

From the 1994 total population of the Study Area, the number of children who would be enrolling in elementary and high school levels for all municipalities is derived.

School age population is extrapolated from the NSO age group classification of 5-9, 10-14 and 15-19 years old bracket by municipality. The age group for the elementary level is from 7 to 13 years, while that for the high school level is from 14 to 17 years. The percentages of school

age population for the target years are based on the existing composition or structure of the 1990 population.

From the school age population, the number of children who would attend either private or public school, by target year is computed using the projected participation rate. The participation rate by target year varies depending on the socio-economic condition of the province. Generally, an improved economy will result to a higher participation rate. For the study area, an increase in the participation rate in both private and public schools is foreseen by year 2010.

The number of public school students by target year is then derived from the projected number of children who will attend school. A participation rate for public school enrollment is established based on the existing participation rate of public school students to the total school age population. The participation rate of 1994 is assumed to be maintained for the year 2000. However, a slight increase of 4% from the 2000 rate is foreseen for the year 2010 (details are referred to Table 8.3.6, Supporting Report).

Table 8.3.2 shows the projected number of public school students by municipality, by target year. A total of 69,647 and 89,856 public school students is estimated to enroll for years 2000 and 2010, respectively.

Table 8.3.2 Projected Public School Enrollment and Number of Public Utilities by Municipality

Municipalities	Number of Public School Students			Number of Public Utilities		
	1994	2000	2010	1994	2000	2010
Abra de Ilog	2,207	2,199	2,718	1	2	2
Calintaan	4,194	5,228	6,598	0	1	2
Looc	1,596	1,785	2,160	0	1	2
Lubang	3,258	4,093	4,967	1	2	2
Magsaysay	6,663	8,289	9,283	0	1	2
Mamburao (Capital)	5,920	7,888	10,097	2	3	3
Paluan	2,120	2,390	2,855	1	1	2
Rizal	5,600	7,203	8,605	0	1	2
Sablayan	4,587	5,936	9,149	1	2	4
San Jose	14,421	18,951	26,633	1	2	5
Sta. Cruz	4,403	5,685	6,791	1	1	2
Provincial Total	54,969	69,647	89,856	8	17	28

8.3.3 Projection of the Number of Public Utilities

The number of public utilities (public markets and bus/jeepney terminals) by target year is projected in urban areas for all municipalities. The provincial physical framework plan and the hierarchy of urban settlements study serve as references in the projection. Bus or jeepney terminals are considered in major transport routes of the province.

Nine (9) public markets/bus terminals are planned to be constructed by year 2000, and another 11 by the year 2010. Refer to Table 8.3.2 for the total number of public utilities by municipality by target year (details are referred to Supporting Report).

8.3.4 Planning Area and its Projected Population for Sewerage

Urban areas with more than 10,000 population provided by Level III water supply systems in 2010 serve as the planning area. Population in the area is considered as the potential population to be served.

A total of 4 municipalities with 102,874 urban population are considered (refer to Table 8.5.5).

8.3.5 Number of Households to be Served by Municipal Solid Waste Collection System

The number of urban households in 2000 is the potential households for the planning (refer to Table 8.3.5, Supporting Report).

8.4 Types of Facilities and Implementation Criteria

In principle, types of facilities and their implementation criteria as prescribed in the National Sector Master Plan are adopted to this PW4SP.

8.4.1 Water Supply

The following are major conditions and assumptions applied to urban and rural water supply, which are intended as a guide for the implementation of sector projects.

(1) Urban water supply

1) Service level

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

2) Utilization of existing facilities

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

3) Water source

Majority of existing Level III systems are utilizing deep wells in view of economy and easy O&M. In this context, priority is given to deep wells wherever applicable.

The groundwater productivity was assumed at an average 1,000 cu.m/day (16 hours a day of operating time) based on the data of operating wells of WDs.

4) Number of systems

In principle, one Level III system is considered for urban area of every municipality. When any Level III system exists, the future requirements are considered as an expansion of the existing system, otherwise a new system was considered.

In addition to the above, any rural barangay/s being served by the existing urban Level III system are considered to be continued throughout the future. A merged Level III system covering more than two municipalities is also considered, if technical and economic conditions are being met.

5) Rehabilitation

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

(2) Rural water supply

1) Service level

The Level I systems are generally planned for rural areas where houses are scattered (deep and/or shallow wells). Spring development is excluded from the Level I planning in view of cost effectiveness. Level II systems are considered where houses are clustered and suitable untapped spring is available.

Service level standards are setforth 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 in actual implementation.

2) Utilization of existing facilities

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

3) Water source

For Level I facilities, deep well construction is given priority wherever applicable in view of safety against possible contamination and stable water supply. Standard specifications of shallow and deep wells are summarized in Table 8.4.1 based on the water source evaluation results presented in Chapter 7. Conventional construction method (driven well) may be employed under the favorable substrata or hydrogeological conditions. The standard structure of wells in application of "open-hole drilling and gravel pack" is presented in Figure 8.4.1, Supporting Report.

Table 8.4.1 Standard Specifications of Level I Wells

Specification	Shallow Well	Deep Well
Construction Method	Open-hole drilling and gravel pack	
Casing Diameter	50 mm	100 mm
Borehole Diameter	150 mm	200 mm
Ranges of Well Depth	Standard Depth	
0 - 20 m	20 m	N.A.
21 - 50 m	N.A.	40 m
51 - 100 m	N.A.	80 m
101 - 150 m	N.A.	120 m

For Level II systems, only untapped springs suitable for water supply purpose are considered. However, no Level II system is taken up in this PW4SP since no suitable untapped spring has been confirmed yet.

4) Number of systems/facilities

Number of Level I wells is estimated based on the service level standard; while, the number of springs coincides with the number of Level II systems.

5) Rehabilitation

Rehabilitation of existing Level I wells is not considered, since most of the existing wells constructed by driving method are not suitable for rehabilitation to recover their functions. However, minor repair work for handpump 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. 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 are considered, while in urban areas with Level III water supply systems, flush type toilets requiring a piped water connection are included.

(2) School toilets

Standard service level currently used by DECS (50 students per unit facility) is employed for both phases.

The standard toilet facility (1 building) with 5 units of toilet bowl to serve for 250 students is adopted for the planning purpose, which is modified from FW4SP design to provide a shallow well as a water source.

(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/jeepney terminal.

The standard FW4SP design 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 lagoons are 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 2000. 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. However, no such springs are reported.

(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 exhibits the population to be served by target year, while Figures 8.5.1 and 8.5.2 present maps showing service coverage by 2000 and 2010, respectively (details are referred to Supporting Report).

Through the Phase I development, approximately 101,600 persons in the province will be served by additional water supply services, of which 24,700 persons or 24% of the total will be urban population and 76,900 persons or 76% will be rural population.

In the Phase II period, a total of 169,000 persons, of which 74,000 persons or 44% in urban area and 95,000 persons or 56% in rural area, will be further benefited by water supply services. This additional service coverage in urban area includes upgrade of service level for 27,100 persons served by Level I and II facilities in 1994.

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 2000 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.

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 bigger than in base year, the target coverage is applied with conditions. When the target coverage is bigger than Level III water supply coverage, the latter coverage is adopted, while in the other case, the

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

Municipalities	Type	Phase I (2000)								Phase II (2010)							
		Total Population	Service Coverage				Additional Population to be Served				Total Population	Service Coverage				Additional Population to be Served			
			Level III	Level II	Level I	Total	Level III	Level II	Level I	Total		Level III	Level II	Level I	Total	Level III	Level II	Level I	Total
Abra de Ilog	Urban	1,816	1,354	0	49	1,403	0	0	0	0	2,333	2,170	0	0	2,170	816	0	0	816
	Rural	11,839	118	118	8,170	8,406	0	0	8,030	8,030	13,979	118	118	13,044	13,280	0	0	4,874	4,874
	Total	13,655	1,472	118	8,219	9,809	0	0	8,030	8,030	16,312	2,288	118	13,044	15,450	816	0	4,874	5,690
Calintaan	Urban	7,360	846	0	4,806	5,652	846	0	0	846	9,632	8,958	0	0	8,958	8,112	0	0	8,112
	Rural	15,244	0	0	10,823	10,823	0	0	1,037	1,037	17,347	0	0	16,480	16,480	0	0	5,657	5,657
	Total	22,584	846	0	15,629	16,475	846	0	1,037	1,883	26,979	8,958	0	16,480	25,438	8,112	0	5,657	13,769
Looc	Urban	4,570	3,502	0	17	3,519	3,502	0	0	3,502	6,966	6,478	0	0	6,478	2,976	0	0	2,976
	Rural	3,268	0	0	2,320	2,320	0	0	2,320	2,320	2,397	0	0	2,320	2,320	0	0	0	0
	Total	7,838	3,502	0	2,337	5,839	3,502	0	2,320	5,822	9,363	6,478	0	2,320	8,798	2,976	0	0	2,976
Lubang	Urban	7,131	5,491	0	0	5,491	1,760	0	0	1,760	8,519	7,923	0	0	7,923	2,432	0	0	2,432
	Rural	16,318	1,695	0	9,891	11,586	0	0	9,891	9,891	19,494	1,695	0	16,824	18,519	0	0	6,933	6,933
	Total	23,449	7,186	0	9,891	17,077	1,760	0	9,891	11,651	28,013	9,618	0	16,824	26,442	2,432	0	6,933	9,365
Magsaysay	Urban	8,658	5,668	102	917	6,667	4,332	0	0	4,332	10,857	10,097	0	0	10,097	4,449	0	0	4,449
	Rural	18,312	324	0	12,678	13,002	0	0	9,739	9,739	21,361	324	0	19,969	20,293	0	0	7,291	7,291
	Total	26,970	5,972	102	13,595	19,669	4,332	0	9,739	14,071	32,218	10,421	0	19,969	30,390	4,449	0	7,291	11,740
Mamburao (Capital)	Urban	13,723	10,040	235	292	10,567	1,088	0	0	1,088	14,626	13,602	0	0	13,602	3,562	0	0	3,562
	Rural	15,290	0	0	10,856	10,856	0	0	10,187	10,187	20,034	0	0	19,032	19,032	0	0	8,176	8,176
	Total	29,013	10,040	235	11,148	21,423	1,088	0	10,187	11,275	34,660	13,602	0	19,032	32,634	3,562	0	8,176	11,738
Paluan	Urban	5,117	1,558	1,848	534	3,940	1,558	0	0	1,558	6,620	6,157	0	0	6,157	4,599	0	0	4,599
	Rural	3,369	0	0	2,392	2,392	0	0	1,645	1,645	3,517	0	0	3,341	3,341	0	0	949	949
	Total	8,486	1,558	1,848	2,926	6,332	1,558	0	1,645	3,203	10,137	6,157	0	3,341	9,498	4,599	0	949	5,548
Rizal	Urban	2,485	1,913	0	0	1,913	1,913	0	0	1,913	2,969	2,761	0	0	2,761	848	0	0	848
	Rural	27,479	0	0	19,970	19,970	0	0	0	0	32,826	0	0	31,185	31,185	0	0	11,215	11,215
	Total	29,964	1,913	0	19,970	21,883	1,913	0	0	1,913	35,795	2,761	0	31,185	33,946	848	0	11,215	12,063
Sablayan	Urban	18,605	9,063	0	5,263	14,326	3,259	0	0	3,259	29,395	27,337	0	0	27,337	18,274	0	0	18,274
	Rural	41,412	178	561	28,664	29,403	0	0	5,066	5,066	42,301	178	561	39,447	40,186	0	0	10,783	10,783
	Total	60,017	9,241	561	33,927	43,729	3,259	0	5,066	8,325	71,696	27,515	561	39,447	67,523	18,274	0	10,783	29,057
San Jose	Urban	40,178	18,539	187	12,211	30,937	6,205	0	0	6,205	47,996	44,636	0	0	44,636	26,097	0	0	26,097
	Rural	74,231	0	345	52,359	52,704	0	0	23,009	23,009	88,676	0	345	83,897	84,242	0	0	31,538	31,538
	Total	114,409	18,539	532	64,570	83,641	6,205	0	23,009	29,214	136,672	44,636	345	83,897	128,878	26,097	0	31,538	57,635
Sta. Cruz	Urban	4,595	2,858	0	680	3,538	271	0	0	271	5,028	4,676	0	0	4,676	1,818	0	0	1,818
	Rural	16,879	1,118	0	10,866	11,984	0	0	5,902	5,902	20,625	1,118	0	18,476	19,594	0	0	7,610	7,610
	Total	21,474	3,976	0	11,546	15,522	271	0	5,902	6,173	25,653	5,794	0	18,476	24,270	1,818	0	7,610	9,428
Provincial Total	Urban	114,218	60,812	2,372	24,769	87,953	24,734	0	0	24,734	144,941	134,795	0	0	134,795	73,983	0	0	73,983
	Rural	243,641	3,433	1,024	168,989	173,446	0	0	76,826	76,826	282,557	3,433	1,024	264,015	268,472	0	0	95,026	95,026
	Total	357,859	64,245	3,396	193,758	261,399	24,734	0	76,826	101,560	427,498	138,228	1,024	264,015	403,267	73,983	0	95,026	169,009

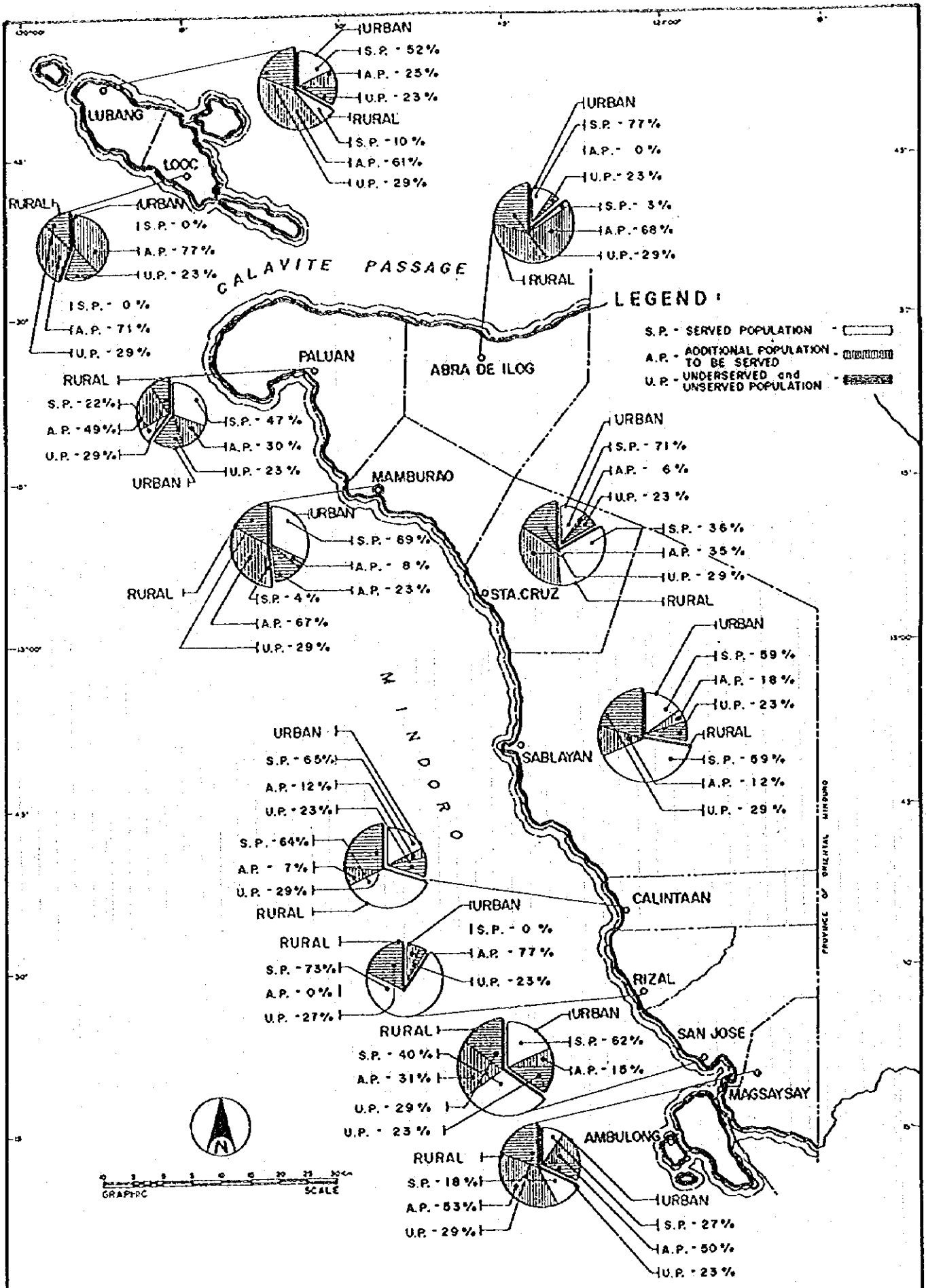


FIGURE 8.5.1
MAP SHOWING FUTURE WATER SUPPLY SERVICE COVERAGE BY 2000

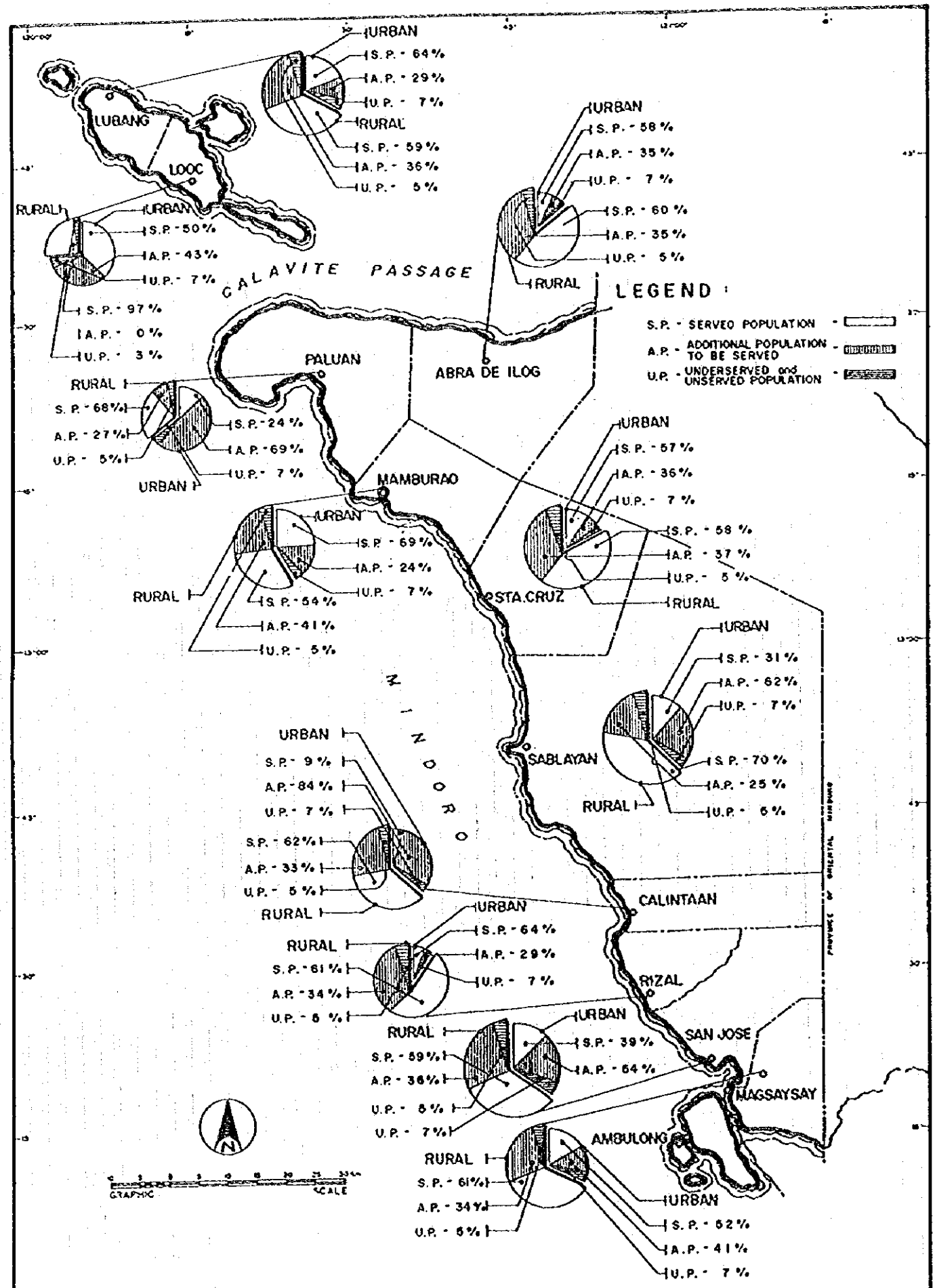


FIGURE 8.5.2

MAP SHOWING FUTURE WATER SUPPLY SERVICE COVERAGE BY 2010

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 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 53,714. The additional households to be served totaled to 13,417, of which 39% is urban households and 61% is rural households. While at the end of Phase II period, the number of served households is 100,469. The additional households to be served are 47,828. Table 8.5.2 summarizes the number of households to be served by target year for urban and rural areas by municipality. Figures 8.5.3 and 8.5.4 present maps showing service coverage by 2000 and 2010, respectively.

(2) School toilets

The service coverage (number of public school students to be served) is estimated by municipality for the years 2000 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.

The projected number of served students at the end of Phase I period is 20,895. The additional students to be served totaled to 10,285. While at the end of Phase II period, the projected number of served students is 44,932. The additional students to be served are

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

Municipality	Area	Phase I (2000)									Phase I I (2010)								
		Total Households	No. of Served Households				Add'l. No. of Households to be Served				Total Households	No. of Served Households				Add'l. No. of Households to be Served			
			Flush	Pour Flush	VIP Latrine	Total	Flush	Pour Flush	VIP Latrine	Total		Flush	Pour Flush	VIP Latrine	Total	Flush	Pour Flush	VIP Latrine	Total
Abra de Ilog	Urban	378	141	204	6	351	0	45	6	51	583	274	274	0	548	133	70	0	203
	Rural	2,519	25	1,876	39	1,940	12	753	39	804	3,495	30	3,256	0	3,286	5	1,380	0	1,385
	Total	2,897	166	2080	45	2,291	12	798	45	855	4,078	304	3,530	0	3,834	138	1,450	0	1,588
Calintaan	Urban	1,335	154	853	21	1,028	154	122	21	297	2,408	1,132	1,132	0	2,264	978	279	0	1,257
	Rural	2,932	0	2,212	45	2,257	0	152	45	197	4,337	0	4,077	0	4,077	0	1,865	0	1,865
	Total	4,267	154	3065	66	3,285	154	274	66	494	6,745	1,132	5,209	0	6,341	978	2,144	0	3,122
Looc	Urban	1,063	229	573	16	819	229	228	16	474	1,742	819	819	0	1,638	590	246	0	836
	Rural	681	0	514	10	524	0	0	10	10	599	0	563	0	563	0	49	0	49
	Total	1,744	229	1087	27	1,343	229	228	27	484	2,341	819	1,382	0	2,201	590	295	0	885
Lubang	Urban	1,621	424	874	25	1,323	0	239	25	264	2,130	1,001	1,001	0	2,002	577	127	0	704
	Rural	3,330	205	2,308	51	2,564	32	409	51	492	4,874	424	4,157	0	4,581	219	1,849	0	2,068
	Total	4,951	629	3182	76	3,887	32	648	76	756	7,004	1,425	5,158	0	6,583	796	1,976	0	2,772
Magsaysay	Urban	1,698	366	915	26	1,307	237	0	26	263	2,714	1,276	1,276	0	2,552	910	361	0	1,271
	Rural	3,391	60	2,499	52	2,611	30	556	52	638	5,340	81	4,939	0	5,020	21	2,440	0	2,461
	Total	5,089	426	3414	78	3,918	267	556	78	901	8,054	1,357	6,215	0	7,572	931	2,801	0	3,732
Mamburao (Capital)	Urban	2,801	755	1,510	43	2,308	0	565	43	608	3,657	1,719	1,719	0	3,438	964	209	0	1,173
	Rural	2,998	0	2,078	46	2,124	0	462	46	508	5,009	0	4,709	0	4,709	0	2,631	0	2,631
	Total	5,799	755	3588	89	4,432	0	1,027	89	1,116	8,666	1,719	6,428	0	8,147	964	2,840	0	3,804
Paluan	Urban	1,066	230	575	16	821	230	407	0	637	1,655	778	778	0	1,556	548	203	0	751
	Rural	732	0	508	11	519	0	328	0	328	879	0	827	0	827	0	319	0	319
	Total	1,798	230	1083	28	1,341	230	735	0	965	2,534	778	1,605	0	2,383	548	522	0	1,070
Rizal	Urban	487	105	262	7	374	105	262	7	374	742	349	349	0	698	244	87	0	331
	Rural	5,284	0	3,987	81	4,068	0	933	81	1,014	8,207	0	7,714	0	7,714	0	3,727	0	3,727
	Total	5,771	105	4249	89	4,443	105	1,195	89	1,389	8,949	349	8,063	0	8,412	244	3,814	0	4,058
Sablayan	Urban	3,510	757	1,892	54	2,703	257	909	54	1,220	7,349	3,454	3,454	0	6,908	2,697	1,562	0	4,259
	Rural	8,120	35	6,092	125	6,252	17	1,197	125	1,339	10,575	44	9,896	0	9,940	9	3,804	0	3,813
	Total	11,630	792	7984	179	8,955	274	2,106	179	2,559	17,924	3,498	13,350	0	16,848	2,706	5,366	0	8,072
San Jose	Urban	7,727	1,666	4,165	119	5,950	656	126	119	901	11,999	5,640	5,640	0	11,280	3,974	1,475	0	5,449
	Rural	14,006	0	10,569	216	10,785	0	1,446	216	1,662	22,169	0	20,839	0	20,839	0	10,270	0	10,270
	Total	21,733	1,666	14734	335	16,735	656	1,572	335	2,563	34,168	5,640	26,479	0	32,119	3,974	11,745	0	15,719
Sta. Cruz	Urban	821	177	443	13	633	177	19	13	209	1,257	591	591	0	1,182	414	148	0	562
	Rural	3,185	196	2,207	49	2,452	196	930	0	1,126	5,156	279	4,568	0	4,847	83	2,361	0	2,444
	Total	4,006	373	2650	62	3,085	373	949	13	1,335	6,413	870	5,159	0	6,029	497	2,509	0	3,006
Provincial Total	Urban	22,507	5,004	12,266	347	17,616	2,045	2,922	330	5,297	36,236	17,033	17,033	0	34,066	12,029	4,767	0	16,796
	Rural	47,178	521	34,850	727	36,098	287	7,166	666	8,120	70,640	858	65,545	0	66,403	337	30,695	0	31,032
	Total	69,685	5,525	47,116	1,073	53,714	2,332	10,088	996	13,417	106,876	17,891	82,578	0	100,469	12,366	35,462	0	47,828

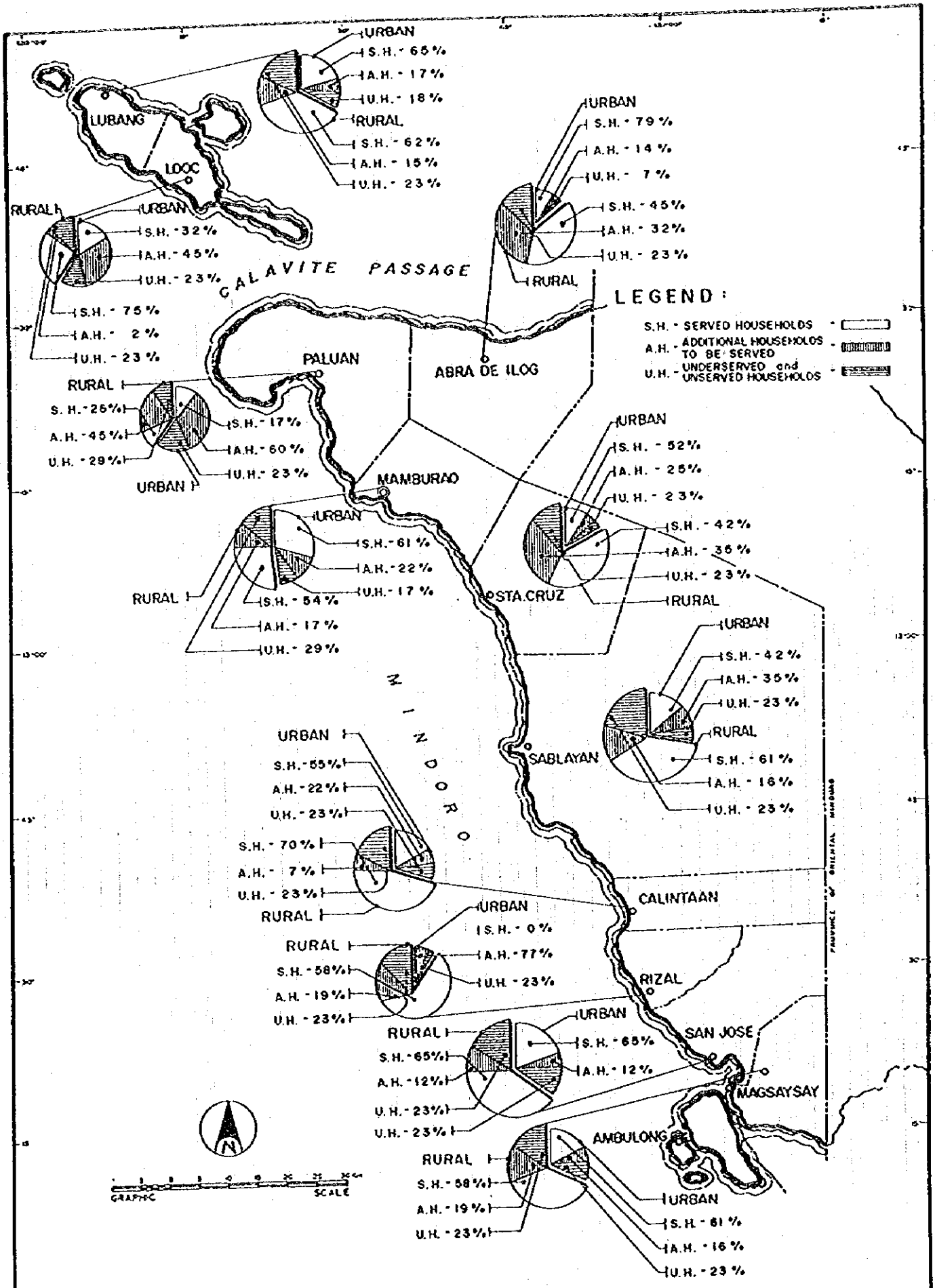


FIGURE 8.5.3

MAP SHOWING HOUSEHOLD TOILETS SERVICE COVERAGE BY 2000

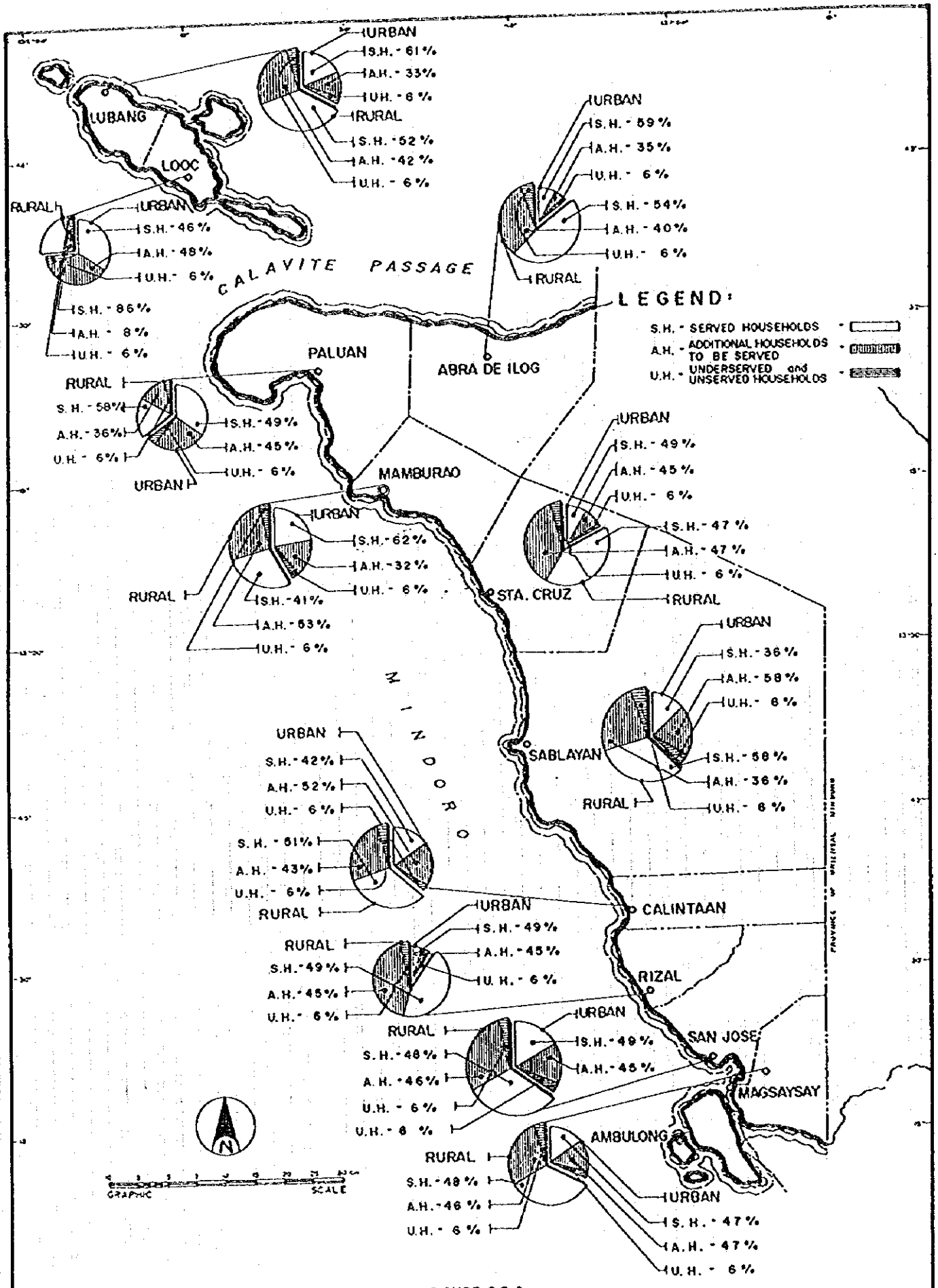


FIGURE 8.5.4

MAP SHOWING HOUSEHOLD TOILETS SERVICE COVERAGE BY 2010

24,037. 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 Students to be Served by Target Year (School Toilets)

Municipality	Phase I (2000)			Phase II (2010)		
	Total No. of Public School Students	No. of Public School Students to be Served	Add'l. No. of Public School Students to be Served	Total No. of Public School Students	No. of Public School Students to be Served	Add'l. No. of Public School Students to be Served
Abra de Ilog	2,199	660	0	2,718	1,359	699
Calintaan	5,228	1,568	668	6,598	3,299	1,731
Looc	1,785	536	86	2,160	1,080	544
Lubang	4,093	1,228	478	4,967	2,484	1,256
Magsaysay	8,289	2,487	987	9,283	4,642	2,155
Mamburao (Capital)	7,888	2,366	1,466	10,097	5,049	2,683
Paluan	2,390	717	117	2,855	1,428	711
Rizal	7,203	2,161	1,411	8,605	4,303	2,142
Sablayan	5,936	1,781	1,081	9,149	4,575	2,794
San Jose	18,951	5,685	2,985	26,633	13,317	7,632
Sta. Cruz	5,685	1,706	1,006	6,791	3,396	1,690
Provincial Total	69,647	20,895	10,285	89,856	44,932	24,037

(3) Public toilets

The service coverage of public utilities with sanitary toilet facility is estimated by municipality for the years 2000 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 16. The additional public utilities to be served are 14. While at the end of Phase II period, the number of served public utilities is 28 with an additional public utilities to be served at 12. Table 8.5.4

summarizes 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

Municipality	Type	Phase I Coverage (2000)		Phase II Coverage (2010)	
		Add'l. No. of Public Utilities with Sanitary Toilets	Number of Public Utilities with Sanitary Toilets	Add'l. No. of Public Utilities with Sanitary Toilets	Number of Public Utilities with Sanitary Toilets
Abra de Ilog	Public Market	1	1	0	1
	Bus/Jeep Terminal	1	1	0	1
	Total	2	2	0	2
Calintaan	Public Market	1	1	0	1
	Bus/Jeep Terminal	0	0	1	1
	Total	1	1	1	2
Looc	Public Market	1	1	0	1
	Bus/Jeep Terminal	0	0	1	1
	Total	1	1	1	2
Lubang	Public Market	1	1	0	1
	Bus/Jeep Terminal	0	1	0	1
	Total	1	2	0	2
Magsaysay	Public Market	1	1	0	1
	Bus/Jeep Terminal	0	0	1	1
	Total	1	1	1	2
Mamburao (Capital)	Public Market	1	1	1	2
	Bus/Jeep Terminal	1	1	0	1
	Total	2	2	1	3
Paluan	Public Market	1	1	0	1
	Bus/Jeep Terminal	0	0	1	1
	Total	1	1	1	2
Rizal	Public Market	1	1	0	1
	Bus/Jeep Terminal	0	0	1	1
	Total	1	1	1	2
Sablayan	Public Market	0	1	1	2
	Bus/Jeep Terminal	1	1	1	2
	Total	1	2	2	4
San Jose	Public Market	1	1	2	3
	Bus/Jeep Terminal	1	1	1	2
	Total	2	2	3	5
Sta. Cruz	Public Market	1	1	0	1
	Bus/Jeep Terminal	0	0	1	1
	Total	1	1	1	2
Provincial Total	Public Market	10	11	4	15
	Bus/Jeep Terminal	4	5	8	13
	Total	14	16	12	28

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.

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

Municipality	Urban Population in 2010	Level III Water Supply Coverage	Population to be Served
Magsaysay	10,857	10,097	5,429
Mamburao (Capital)	14,626	13,602	7,313
Sablayan	29,395	27,337	14,698
San Jose	47,996	44,636	23,998
Provincial Total	102,874	95,672	51,438

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 is assumed to be 50% with reference to the current service coverage of 33%. Additional service coverage in Phase I is calculated as a shortfall of target coverage in Phase I comparing with existing service coverage. Table 8.5.6 presents additional service coverage for Phase I in the urban area.

Table 8.5.6 Add'l. No. of Urban Households to be Served by Municipal Solid Waste System in Phase I

Municipality	No. of Urban Households Served in the Base Year	No. of Urban Households (2000)	Urban Household Coverage (2000)	Add'l. No. of Urban Households to be Served
Abra de Ilog	0	378	189	189
Calintaan	0	1,335	668	668
Looc	0	1,063	532	532
Lubang	0	1,621	811	811
Magsaysay	0	1,698	849	849
Mamburao (Capital)	1,085	2,801	1,401	316
Paluan	0	1,066	533	533
Rizal	0	487	244	244
Sablayan	0	3,510	1,755	1,755
San Jose	4,840	7,727	4,840	0
Sta. Cruz	0	821	411	411
Provincial Total	5,925	22,507	12,233	6,308

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 Supporting Report).

Urban water supply:

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

Rural water supply:

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

(2) Rehabilitation

Rehabilitation requirements are estimated as 10% of the total number of deep wells to be constructed under PW4SP. Rehabilitation work is mainly redevelopment of wells by means of air surging, while minor repair of concrete apron and handpump was considered to 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;

Transportation- service vehicle.

Office equipment- computer with printer, typewriter, mimeo machine, scanning machine and copier.

Table 8.6.1 Water Supply Facilities Required by Target Year

Municipality	Phase I (2000) Requirements											Phase II (2010) Requirements							
	Urban Water Supply (Level III)			Rural Water Supply								Urban Water Supply (Level III)		Rural Water Supply (Level I)					
				Level II		Level I													
	Mode of Project	No. of Additional Deep Wells	Number of House Connections	Number of System	No. of Communal Faucets	Number of Deep Wells				Number of Shallow Wells	Total No. of Wells	No. of Additional Deep Wells	Number of House Connections	Number of Deep Wells				Number of Shallow Wells	Total No. of Wells
						40 m	80 m	120 m	Sub-total					40 m	80 m	120 m	Sub-total		
Abra de Ilog	Expansion	0	0	0	0	34	0	0	34	80	114	1	204	25	0	0	25	57	82
Calintaan	New	1	154	0	0	4	0	0	4	10	14	2	2,028	29	0	0	29	66	95
Looc	New	1	815	0	0	13	0	0	13	20	33	1	744	0	0	0	0	0	0
Lubang	Expansion	1	400	0	0	108	0	0	108	27	135	1	608	93	0	0	93	23	116
Magsaysay	Expansion	1	850	0	0	73	0	0	73	48	121	1	1,112	73	0	0	73	49	122
Mamburao (Capital)	Expansion	1	222	0	0	121	0	0	121	13	134	1	891	123	0	0	123	14	137
Paluan	New	1	325	0	0	0	0	0	0	24	24	1	1,150	0	0	0	0	16	16
Rizal	New	1	375	0	0	0	0	0	0	0	0	1	212	187	0	0	187	0	187
Sablayan	Expansion	1	615	0	0	40	0	0	40	27	67	3	4,569	108	0	0	108	72	180
San Jose	Expansion	1	1,193	0	0	116	0	0	116	174	290	4	6,524	210	0	0	210	316	526
Sta. Cruz	New	1	48	0	0	53	0	0	53	22	75	1	455	89	0	0	89	38	127
Provincial Total	New——5 Expansion- 6	10	4,997	0	0	562	0	0	562	445	1,007	17	18,497	937	0	0	937	651	1,588

Table 8.6.2 Sanitation Facilities Required by Target Year

Municipality	Phase I (2000) Requirements												Phase I (2010) Requirements											
	Urban Sanitation							Rural Sanitation					Urban Sanitation							Rural Sanitation				
	Number of Household Toilets				Number of	No. of Public Toilets		Number of Household Toilets				Number of	Number of Household Toilets				Number of	No. of Public Toilets		Number of Household Toilets				Number of
	Flush	Pour Flush	VIP Latrine	Total	Public School Toilets	Public Markets	Bus Terminal	Flush	Pour Flush	VIP Latrine	Total	Public School Toilets	Flush	Pour Flush	VIP Latrine	Total	Public School Toilets	Public Markets	Bus Terminals	Flush	Pour Flush	VIP Latrine	Total	Public School Toilets
Abra de Ilog	0	45	6	51	0	1	1	12	753	39	804	0	133	70	0	203	0	0	0	5	1,380	0	1,385	3
Calintaan	134	122	21	297	0	1	0	0	152	45	197	3	978	279	0	1,257	2	0	1	0	1,865	0	1,865	5
Looc	229	228	16	474	0	1	0	0	0	10	10	0	590	246	0	836	2	0	1	0	49	0	49	0
Lubang	0	239	25	264	0	1	0	32	409	51	492	2	577	127	0	704	2	0	0	219	1,849	0	2,068	3
Magsaysay	237	0	26	263	1	1	0	30	556	52	638	3	910	361	0	1,271	3	0	1	21	2,440	0	2,461	6
Mamburao (Capital)	0	565	43	608	3	1	1	0	462	46	508	3	964	209	0	1,173	5	1	0	0	2,631	0	2,631	6
Paluan	230	407	0	637	0	1	0	0	328	0	328	0	548	203	0	751	2	0	1	0	319	0	319	1
Rizal	105	262	7	374	0	1	0	0	933	81	1,014	6	244	87	0	331	0	0	1	0	3,727	0	3,727	9
Sablayan	257	909	54	1,220	1	0	1	17	1,197	125	1,339	3	2,697	1,562	0	4,259	5	1	1	9	3,804	0	3,813	6
San Jose	656	126	119	901	4	1	1	0	1,446	216	1,662	8	3,974	1,475	0	5,449	11	2	1	0	10,270	0	10,270	20
Sta. Cruz	177	19	13	209	0	1	0	196	930	0	1,126	4	414	148	0	562	1	0	1	83	2,361	0	2,444	6
Provincial Total	2,045	2,922	330	5,297	9	10	4	287	7,166	666	8,120	32	12,029	4,767	0	16,796	33	4	8	337	30,695	0	31,032	65

Field equipment- water testing kit, 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 the Phase I period, a total of 1,007 Level I wells (562 deep and 445 shallow wells) shall be newly constructed and 10% of these deep wells shall be rehabilitated annually. Although there are huge requirements, only 1 unit of truck-mounted percussion drilling rig and 1 unit of portable mechanized rotary drilling rig are available at DPWH-DEO in the province, while no air compressor for well rehabilitation equipment is available neither at provincial government nor sector agencies.

Therefore, a total of 16 sets of drilling rigs (5 sets of small size rotary type, 5 sets of medium size rotary type and 6 sets of medium size percussion type) together with 2 sets of well rehabilitation equipment, 7 units of support vehicles for shallow well construction and well rehabilitation and 11 units of service trucks for deep well construction shall be mobilized/procured either by private sector or LGUs (details are referred to Supporting Report).

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 are estimated based on the 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 are estimated based on the standard number of students to be served by a 5-unit standard facility and the additional students to be served by target year (details are referred to Supporting Report).

Total required facilities are 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 are estimated based on the additional number of toilets for public markets and bus/jeepney 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. Additional units of truck arrived at ten (10) to meet assumed service coverage as reflected in Table 8.6.3.

Table 8.6.3 Number of Refuse Collection Trucks Required in Phase I

Municipality	Additional Urban Households to be Served	Estimated Daily Amount of Refuse to be Generated (Kg)	Number of Collection Truck Required
Abra de Ilog	189	79	1
Calintaan	668	279	1
Looc	532	222	1
Lubang	811	339	1
Magsaysay	849	355	1
Mamburao (Capital)	316	132	1
Paluan	533	223	1
Rizal	244	102	1
Sablayan	1,755	734	1
San Jose	0	0	0
Sta. Cruz	411	172	1
Provincial Total	6,308	2,637	10

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 for implementing PW4SP.

Specific projects shall be selected subject to detailed studies and rather not discussed in 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 WDs for future expansion work.

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 would be given to projects with positive feasibility studies, although no funding source has been identified. The third level should be those for which feasibility study has been conducted. Within each level, if funds were insufficient, a ranking could be carried out in application of some factors such as willingness to pay, water-related diseases status and per capita cost. Under the above mentioned conditions, a list of projects shall be prepared by the implementors.

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 study, Chapter 11) may be used for implementation arrangements.

Chapter 9

SECTOR MANAGEMENT PLAN

9. SECTOR MANAGEMENT PLAN

9.1 General

In order to effectively manage the water and sanitation sector, the provincial and municipal governments will have to make some adjustments in their current structures and policies. 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, for example: the on-going study on access of LGUs to external financing assistance and the formulation of the Implementing Rules and Regulations to guide, among others, the sector devolution process.

9.2 Sector Management

(1) Development of the vision

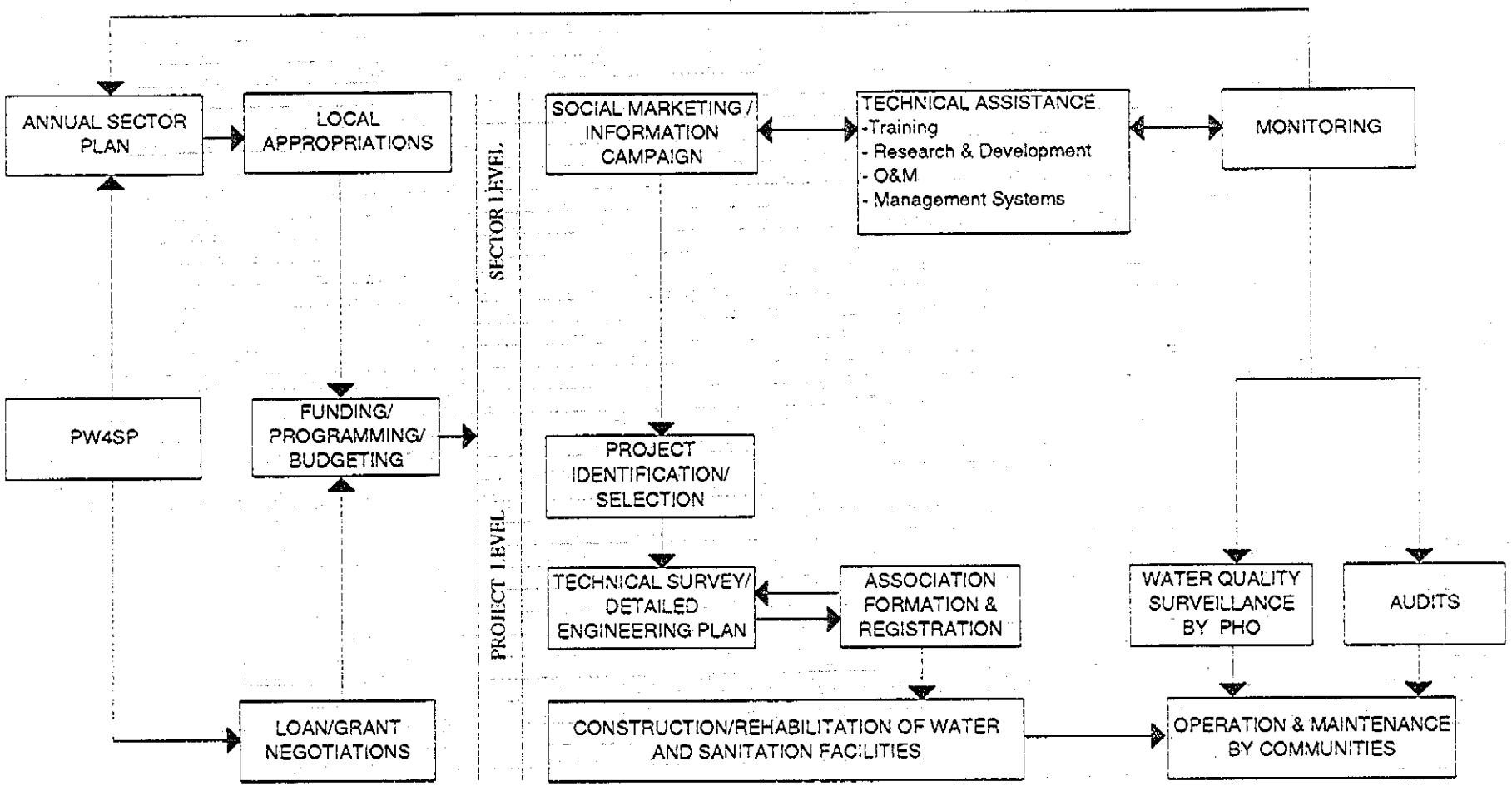
One glaring institutional need at the local level is a common vision and mission statement for the sector. A critical mass of people and resources who share in the vision must be identified and harnessed for project implementation. Local planners need to focus on the long-term requirements i.e., beyond forming users' associations, drilling wells, distributing bowls, etc. 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 has formulated a two-phased plan which seeks to dramatically improve the provision of water supply & sanitation. In the medium-term (2000), the province seeks to increase water supply in urban areas to 77%; 71%, in rural areas. Sanitation facilities will be made available to 77% of the population; 30% of the public school students will have adequate sanitary toilet facilities. In the long-term (2010), urban water supply coverage will rise to 93%; rural water supply to 95%. Sanitation coverage will rise to 94%; public school students coverage will rise to 50%.

(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 input into Loan or Grant Negotiations in the future. The

Figure 9.2.1 Sector Management Model



Annual Sector Plan, together with the budgets will be reviewed by the Governor and passed upon by the legislation as part of the annual provincial budget approval process.

The Sector Level Implementation activities consist principally of three (3) broad areas: social marketing; technical assistance; and monitoring. Project selection follows on from a self-selection process. The identification of a responsible community-based association and technical studies, as needed, will be done. Only after the institutional, financial and technical studies have been done, construction or rehabilitation will take place. 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 augmented with water quality surveillance by the Provincial Health Office (PHO) and operational audits done by the LGU.

(3) Service provision policies and objectives

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

1) Level I facilities serve, at most, 15 (fifteen) households; Level II public taps serve 5 (five) households; and Level III provides individual household connections.
2) Water supply provision will be at least 20 lpcd for Level I; 60 lpcd for Level II; and 100 lpcd for Level III.
3) A critical mass of 70% of the individual households in every barangay has sanitary toilet facilities.
4) All schools shall have adequate water supply and at least one sanitary toilet facility for every 50 students.

(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 the local conditions and resources. However, construction of economical facilities shall be pursued not necessarily insisting on low-cost. Phased upward integration and future upgrading of systems and facilities shall 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) The LGU shall seek to provide water and sanitation in an equitable manner between rural and urban areas; between wealthy and depressed areas.

6) 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. The current national policy is that 100% of the capital costs for Level I systems are provided as grant; communities, however, have to establish an O&M reserve fund and are responsible for all maintenance and operating costs. Water source development is provided as grants for Level II systems; full cost recovery is required for all other capital costs. Full capital and O&M cost recovery is required for Level III systems.

7) 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.

8) The province's fiscal management, in terms of capital funds generation capability, budget and disbursement, shall be improved. The assistance of legislative branch in the enactment of the proposed revenue-generating measures shall be sought. Financing through the private sector will also be encouraged.

9) Sector development shall be consistent with broader concerns for the environmental protection and management. Pollution control, conservation and proper utilization of water and land resources are critical issues. An environmentally-responsive management approach to resource use shall be pursued.

10) 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).

(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) are within the mandate of the National Water Resources Board. Studies are underway to strengthen the linkages between the Board and other agencies, including LGUs, particularly in the enforcement of NWRB policies.

2) Water Rate Review: While the rate setting and approval functions remain largely as a concern of the associations or the water districts (and LWUA), a vehicle for redressing 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 meet the potability standards. The DOH currently has the responsibility and the regulatory power to stop the operations of water systems not delivering potable water.

(6) Financing system

Current policy shifts present an opportunity for the LGU to establish the conduit for future local and foreign-assisted projects. Presently, funds are brought to the field level

through government allotment and sub-allotment systems. Apart from being cumbersome and subject to delays, the more critical idiosyncrasy of this system is that the actual project implementation "power" still lies in the hands of national agencies.

Overall, it is the LGU 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 source of funds are envisaged to be provincial & local taxes & allocation from the IRA 20% Development Fund. Also, in the medium-term, it is envisaged that national & external funds will, although diminishing, continue to be channeled through local offices of central agencies.

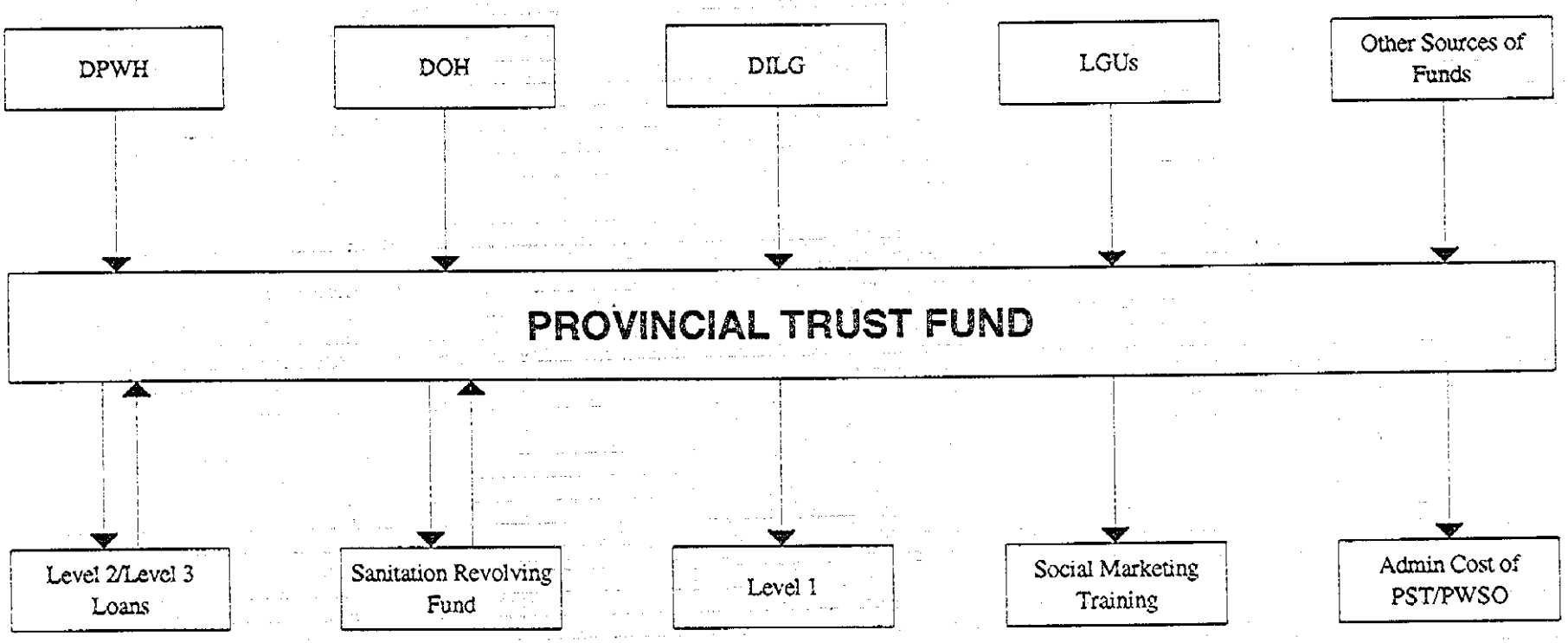
Studies are underway to look into the feasibility of direct access of LGUs to external funds. The LGU will continue to monitor the developments and policy decision to be established as these will invariably affect local financing mechanisms.

In the long-term, the Provincial Sector Trust Fund approach (Fig. 9.2.2) may be an additional mechanism for financing project-related activities. This Trust Fund can be the transition arrangement as the line departments gradually reduce their direct control over sector funds. The Trust Fund could also raise the LGUs responsibility for effective and efficient utilization of these funds. The Trust Fund may be regularly replenished by the line departments upon liquidation. The controlling device at the national level will be in the replenishment of the trust fund. If the results are not satisfactory, national government should be able to institute changes as conditions to fund replenishment. Reviews can be done regularly. This arrangement is subject to agreement with respective line departments.

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 Trust Fund and the sanitation revolving fund will have to be enacted.

Figure 9.2.2 Flow of Funds



9.3 Institutional Arrangements

In the medium-term, a full-time Provincial Sector Team (PST) for coordination and institution-building shall be set up. The LGU should ensure that adequate logistics and incentives are provided. This Team may be supplemented by staff detailed full-time from national and local agencies, as needed. In the long term, the core group from the Team could be established into a new Provincial Water and Sanitation Office (PWSO) to continue to promote, assist and monitor all water supply and sanitation services in cooperation with the municipalities. The DILG-PMO shall continue to provide technical and managerial assistance in the formative years of the PST/PWSO.

With the on-going discussions, it is not entirely clear at this time, how the water supply development capacity at the DPWH-DEO may be harnessed. One scenario is for the DEO to provide technical services at cost and in competition with other private contractors. Another scenario might call for the actual transfer of resources (equipment and staff) to the LGU. Policy decision and guidelines will be taken shortly at the national level.

The initial professional-level staffing of the PST/PWSO are estimated 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

The Governor will make the appointment based on the short list. DILG will assist in preparing the shortlist of candidates for PST/PWSO Coordinator. The draft Terms of Reference for the various posts is proposed as follows.

(1) The Provincial Water Supply & Sanitation Coordinator (PWSC) will lead an interdisciplinary Provincial Sector Team. He 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. He/she will also liaise with all project implementors at the municipal level. The PWSC shall be the key contact person of the DILG PMO. Specific duties include:

1) 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.
2) 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.
3) Guide the conduct of sector and project management and the supervision, and coordination of the PST/PWSO; ensure the quality and timeliness of the outputs of the other agencies and consultants.
4) Assess all future inputs required for project planning, design, supervision of construction and monitoring in subsequent phases of project implementation.
5) Take steps to ensure that adequate financing is available to support the sector capital development requirements.
6) Assist in the negotiations for external grants and loans.
7) 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 PWSO.

(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:
1) Identify initial areas and develop implementation arrangements for launching the project in the various municipalities.
2) Conduct regular dialogue and disseminate information among local leaders on water, sanitation and health issues.
3) Assist municipalities in overseeing the organization (or accreditation) of associations which will be responsible for water supply and sanitation facilities.
4) Coordinate the health and hygiene education program province-wide.
5) 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.

6) 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.

7) 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.

8) 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.

9) Assist in coordinating activities of the municipal liaison.

(4) The Water Supply and Sanitation Engineer (WSSE) will be responsible for all the technical aspects of the project including feasibility studies, design, construction, operation and maintenance. The WSSE will report to the PWSC. Specific duties include:

1) Review the existing technical and environmental situation relating to water supply and sanitation facilities and assess the needs for new facilities and rehabilitation.

2) 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.

3) Review design standards for water supply and for on-site sanitation (human excreta disposal) facilities for individual households, communal and school latrines.

4) 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.

5) Prepare standard contract documents, specifications and cost estimates for civil works and procurement.

6) Ensure proper construction supervision and monitoring in coordination with the municipal liaison. Ensure timely transport of LGU-provided materials to project sites.

7) Provide for adequate maintenance of LGUs equipment and tools for water and sanitation facilities, including drilling rigs and vehicles.

8) Supervise major repair or rehabilitation work beyond the capacity of communities to undertake.

9) 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:

1) Draft all project reports and documents including the quarterly and annual Sector Report.

2) Maintain the Registry of associations responsible for water and sanitation in their respective communities.

3) Coordinate and develop indicators for monitoring and evaluating the achievement of project objectives.

4) Monitor actual costs for typical water supply and sanitation systems.

(6) At the municipal level, a Municipal Sector Liaison (MSL) will be appointed by the Mayor. Staff to be appointed may be the municipal development coordinator, the municipal engineer, the municipal health officer or any other qualified staff selected by the Mayor. 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 PST/PWSO 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 programs the municipal funds (from municipal IRA allocation or other sources) to provide counterpart support or to fully finance the projects.

Supported by the PST/PWSO, 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 PST/PWSO. 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.

(7) 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.

(8) At the national level, DPWH, DOH and DILG will continue to provide technical assistance to LGUs per NEDA Resolution No. 4, either directly or through their local field offices and staff. 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 to be provided 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. Further national policy guidelines will be issued by NEDA and the Office of the President.

9.4 Project Management Arrangements

(1) Level I

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.

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 PST/PWSO will assist, if needed, the association in securing soft loans, if the reserve funds are inadequate.

8) Operation & Maintenance will generally be the reponsibility 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

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. (See 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.

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

1) Project Selection: Most 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. The point is that service level selection are community decisions.

2) Organization: There are several viable Level III models which may be adopted: the Water District Concept; an LGUs-managed system: a cooperative-run system; or a privately-owned and managed system. 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, revealed many difficulties because of numerous government controls and restrictions. The private sector may be a viable option using the BOT mechanism or even as a longer term investment for private entrepreneurs for larger systems.
3) Technology and Technical Design Specifications: Regardless of the 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 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 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. In addition, business practice systems shall be adopted. The LWUA has established a comprehensive commercial practice system, which may be adopted by the organization.

9.5 Community Development Models

Policy: The LGU views community development and involvement principally as regular multisectoral activities, not project-related activities. This implies the need for the LGU to

establish an institutional mechanism at the provincial and municipal levels to enhance trust and confidence of communities to the LGU and its ability and motivation for provision of vital services. Community management of the systems is a vital element for sustainability of the facilities. Communities are viewed not merely as beneficiaries but as decision makers for critical aspects of local projects. Communities will be encouraged to collectively take stock of their resources and constraints and agree on a development program.

The LGU will review the roles and responsibilities of central and local governments, NGOs, the private sector and communities themselves. It shall assess community participation activities and related institutional arrangements of past community projects and constantly look into creative ways to promote and enable local participation.

The LGU shall promote the participation of NGOs to catalyze the involvement of women, youth, people's organizations (PVOs) and other segments of the community in project decision-making and management. It will focus on the role of women in the context of the design of institutional arrangements at all service levels. The review shall include: brief overview of women's socio-economic situation and their role in water and sanitation services; analysis of relevant NGOs, women's groups and private agencies that support community; and assessment of support action for women's participation essential for project sustainability.

For specific sector projects, the LGU will adopt a three-phase community involvement model. The model will outline the decision and action points, for which community inputs will be sought. These inputs are categorized according to the Pre-Construction Phase, the Construction Phase and the Post-Construction Phase.

Responsibilities: At the municipal level, the Municipal Sector Liason will play a leading role in ensuring involvement of the beneficiaries at all phases of the project. The Community Development and Training Specialist of the municipality trained by PST/PWSO will provide technical assistance and advice.

One of the key activities in the PW4SP preparation is the formulation of viable models to promote community development in the projects. Each one model for Level I, II and III service was formulated based on socio-economic profiles, service needs and experience in selected communities. It is important to have a clear sequence (a strategy) to enable the communities to participate in the project through all the process.

Three sites were selected based on a set criteria which includes: needs, health situation, source availability, accessibility, potentials for replication, etc. The sites selected for the province are outlined in the table below; full write-up of the case is included in 9.5 Supporting Report.

Table 9.5.1 Summary of Community Development Study Sites

Model Study Site	Proposed Service Level	Urban or Rural	Potential Service Area		Potential Water Source	Sanitation Issues
			Population	Households		
Sitio Casoy, Bgy Balansay, Mamburao	I	R	300	30	Deep Well	No
Bgy San Luis, Mamburao	II	R	1,300	146	Spring	Yes
Municipality of Sta. Cruz	III	U	4,500	906	Spring &/or Deep Well	Yes

(1) For Level I facilities, community involvement and participation shall be promoted in the following manner.

1) Pre-Construction Phase

(a) Dissemination of information

(b) Establishment (or selection) of barangay or purok association and of the working relationships with other agencies

(c) Election of officials

(d) Assistance for the selection of potential water sources

(e) Agreement on O&M arrangements

(f) Computation and approval of water charges

(g) Preparation of work plan

(h) Agreement to proceed the project

(i) Assistance for the selection of contractor/s

(j) Securing right-of-way (deed of donation or permit to use) for facility sites

2) Construction Phase

(a) Provision of labor counterpart

(b) Provision of materials

(c) Dissemination of information

(d) Inspection and feedback of the project activities

(e) Provision of access to the contractor/s

3) Post-Construction Phase

(a) Payment/collection of fees; fund-raising activities

(b) Getting water samples regularly for quality testing

(c) Preventive maintenance

(d) Minor repair and parts replacement

(e) Dissemination of health and hygiene information

(f) Auditing of finances

(g) Attendance in community meetings

(h) Provision of adequate source protection, including maintenance of drainage to protect well site from contamination

(i) Formulation of future improvement plans

(j) Approval of major capital or rehabilitation budgets

(k) Collection and provision of information as requested by the RHU or MSL

(l) Preparation/maintenance of the barangay or site maps

(2) For Level II facilities

1) Pre-Construction Phase

(a) Establishment of barangay or purok arrangements and working relationships with other agencies

(b) Identification and selection of potential water sources

(c) Identification of the location of communal faucets

(d) Agreement to proceed the project

(e) Dissemination of information

(f) Election of officials

(g) Agreement on O&M arrangements

(h) Computation and approval of water charges

(i) Preparation of work plan

(j) Securing right-of-way (deed of donation or permit to use) for facility sites

(k) Selection of local contractor/s

2) Construction Phase

(a) Provision of labor counterpart

(b) Provision of materials

(c) Dissemination of information

(d) Inspection and feedback of the project activities

(e) Provision of access to contractor/s

3) Post-Construction Phase

(a) Payment/collection of fees; fund-raising activities

(b) Getting water samples regularly for quality testing

(c) Formulation of improvement plans