JAPAN INTERNATIONAL COOPERATION AGENCY

DEPARTMENT OF THE INTERIOR AND LOCAL GOVERNMENT
THE REPUBLIC OF THE PHILIPPINES

STUDY ON THE PROVINCIAL WATER SUPPLY, SEWERAGE AND SANITATION SECTOR PLAN IN THE REPUBLIC OF THE PHILIPPINES

VOLUME II - 8

MAIN REPORT

PROVINCIAL WATER SUPPLY, SEWERAGE AND SANITATION SECTOR PLAN FOR THE PROVINCE OF

BATANES

FEBRUARY 1996

NIPPON JOGESUIDO SEKKEI CO., LTD.

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Republic of the Philippines
PROVINCE OF BATANES
BASCO
OFFICE OF THE PROVINCIAL GOVERNOR

MESSAGE

Greetings from the northernmost island Province of Batanes.

First of all, I would like to express my sincerest appreciation and gratitude for the inclusion of my province as one of the recipients of the grant funding from Japan International Cooperation Agency (JICA) for the preparation of our Provincial Water Supply, Sewerage and Sanitation Sector Plan (PW4SP) in consonance with the national government's program thrust on the sector as embodied in the nation's vision and strategy of development.

This development is projected to bring greater collaboration among local and national leaders, decision makers and workers provincewide into unprecedented levels of cooperation and understanding in pursuit of programs and projects in this sector. In fact, these and other forthcoming challenges must preoccupy those tasked with the socio-economic preparation of the people of Batanes towards nation building.

Indeed, while many challenges represent tremendous opportunities, we must remember that only by continuing to invest in the development of our people can we earn the right to stand proudly, shoulder to shoulder, with the most productive provinces in the region and in the country as a whole.

Truly, the whole series of activities undertaken in the preparation of our PW4SP coincided with our strategic view of human resource development which focuses on the needs of the future while building capabilities for the present.

Again, thank you and looking forward to our continuing cooperation towards nation-building and the attainment of our vision and strategy of development for a better quality of life for my people in the province and the country as a whole.

Mabuhay tayong lahat!

TELESFORO F. CASTILLEJOS
Governor

PROVINCIAL WATER SUPPLY, SEWERAGE AND SANITATION SECTOR PLAN

VOLUME II - 8 MAIN REPORT

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LIST OF ABBREVIATIONS

ADB	-	Asian Development Bank
AIDAB	-	Australian International Development Assistance Bureau
AIM	-	Asian Institute of Management
AIP	-	Annual Investment Plans
BC	-	Barangay Council
BMGS	-	Bureau of Mines and Geo-Sciences (defunct), the now Mines and Geo-Sciences Bureau
BOD	-	Biochemical Oxygen Demand
BWP	-	Barangay Water Program
BWSA	-	Barangay Waterworks and Sanitation Association
CBO	-	Community-Based Organizations
CDF	-	Countryside Development Fund
CDTS	-	Community Development and Training Specialist
CIDA	-	Canadian International Development Agency
CPC	-	Country Program for Children
CPH	-	Census on Population and Housing
CPSO	-	Central Project Support Office
CSC	-	Civil Service Commission
D/D	-	Detailed Design
DA	-	Department of Agriculture
DAP	-	Development Academy of the Philippines
DBM	-	Department of Budget and Management
DECS	-	Department of Education, Culture and Sports
DENR	-	Department of Environment and Natural Resources
DEO	-	District Engineering Office
DILG	-	Department of the Interior and Local Government
DOF	-	Department of Finance
DOH	-	Department of Health
DPWH	-	Department of Public Works and Highways
DSWD	-	Department of Social Welfare and Development
DTI	-	Department of Trade and Industry
F/S	-	Feasibility Study
FW4SP	-	First Water Supply, Sewerage and Sanitation Sector Project
GOP	-	Government of the Philippines
IBRD	-	International Bank for Reconstruction and Development
IEC	-	Information, Education and Communication
IRA	-	Internal Revenue Allotment
IRR	-	Implementing Rules and Regulations
ITN	-	International Training Network
JICA	-	Japan International Cooperation Agency
LGC	-	Local Government Code
LGU	-	Local Government Unit
LWUA	-	Local Water Utilities Administration
MEO	-	Municipal Engineer's Office
MLGOO	-	Municipal Local Government Operations Officer
MPDO	-	Municipal Planning and Development Office
MS	-	Monitoring Specialist
MSL	-	Municipal Sector Liaison

MTPDP	-	Medium-Term Philippine Development Plan
MWSS	-	Metropolitan Waterworks and Sewerage System
NAMRIA	-	National Mapping and Resource Information Authority
NDCC	-	National Disaster Coordinating Council
NEDA	-	National Economic and Development Authority
NGOs	-	Non-Governmental Organizations
NMP	-	National Master Plan
NMYC	-	National Manpower Youth Council
NSMP	-	National Sector Master Plan
NSO	-	National Statistics Office
NWRB	-	National Water Resources Board
O&M	-	Operation and Maintenance
PD	-	Presidential Decree
PDC	-	Provincial Development Council
PEO	-	Provincial Engineer's Office
PHO	-	Provincial Health Office
PLGOO	-	Provincial Local Government Operations Officer
PMO	-	Project Management Office
PMU	-	Provincial Monitoring Unit
POPCOM	-	Population Commission
PoW	-	Program of Work
PPAC	-	Philippine Plan of Action for Children
PPDC	-	Provincial Planning and Development Coordinator
PPDO	-	Provincial Planning and Development Office
PSPT	-	Provincial Sector Planning Team
PST	-	Provincial Sector Team
PW4SP	-	Provincial Water Supply, Sewerage and Sanitation Sector Plan
PWSO	-	Provincial Water and Sanitation Office
RA	-	Republic Act
RHUs	-	Rural Health Units
RWSA	-	Rural Waterworks and Sanitation Association
UNDP	-	United Nations Development Programme
UNICEF	-	United Nations International Children's Emergency Fund
VIP	-	Ventilated Improved Pit Latrine
WASAMS	-	Water and Sanitation Monitoring System
WATSAN	-	Water and Sanitation
WD	-	Water District
WHO	-	World Health Organization
WSSE	-	Water Supply and Sanitation Engineer

Chapter 1

INTRODUCTION

1. INTRODUCTION

1.1 Sector Development in the Philippines

The Government of the Philippines (GOP) has, over the last decade, with the assistance from external donors, made considerable progress in developing the water supply and sanitation sector. Developments have covered physical and institutional framework nationwide.

Nevertheless, infrastructure service delivery including this sector during the period of 1987 to 1995 has been insufficient to keep pace with the demand which was magnified by natural calamities.

About 66% (42.6 M) of the population nationwide enjoyed access to potable water supply in 1992 (61% in 1986). In urban areas outside Manila, 47% (9.97 M) had access to safe water supply services, while in the rural areas, 80% (26.65 M) was covered by point water sources. However, of the rural population, it was estimated that only 72% (23.9 M) was served by the existing facilities because some facilities were damaged or non-functioning. Furthermore, population served adequately by safe sources may be discounted.

Private sanitary toilets were available to 77% (9.4 M) of the total household nationwide in 1992. About 87% (5.3 M) of the households in urban areas was served by sanitary toilets, while only 67% (4.1 M) of the rural households was served. Comparing the service coverage of 77% in 1992 with that of 73% in 1987, an increase of a mere 5% of the number of available sanitary toilets was achieved within a 5 year period. Communal toilet facilities are generally found only at schools, public markets and in some cases bus terminals and town parks. For sewerage, only portions of the cities of Metro Manila, Cebu and Baguio have sewerage systems. Municipal refuse collection using trucks is limited to urban areas. In 1992, majority of the households (81%) practiced individual disposal, while the remaining 19% relied on municipal refuse collection and disposal.

Activities in the sector are currently guided by the Water Supply, Sewerage and Sanitation Master Plan of the Philippines 1988-2000, issued in 1988 and the Medium-Term Philippine Development Plan (MTPDP: 1993-1998) in 1992. The National Sector Master Plan (NSMP) sets ambitious targets to reach large segments of the population and to redress the imbalances between rural and urban areas. Meanwhile, the MTPDP revised the targets for water supply services based on current conditions.

Development in the sector has previously to a high degree been directed by central government agencies. However, the GOP is currently in the process of decentralizing the responsibilities for implementation of infrastructure projects to Local Government Units (LGUs), in line with the Local Government Code of 1991.

The GOP is under preparation on detailed arrangements in accordance with broad reforms aimed at streamlining sectoral activities. Therefore, the institutional framework in the provincial plan is tentative.

1.2 Provincial Sector Planning

1.2.1 Objectives of Sector Planning

The main objectives of the provincial sector plan are:

(1) To prepare a Long-Term Development Plan with a target year of 2010 for the water supply, sewerage and sanitation sector;

(2) To prepare a Medium-Term Investment Plan for the sector covering the years 1996-2000 to form the basis for implementing foreign and locally funded projects;

(3) To recommend arrangements and logistics for implementing; and

(4) To identify the needs for institutional strengthening.

1.2.2 Scope of Sector Planning

The study covers the following major elements to achieve the objectives mentioned above.

(1) Collection and Review of Previous Studies and Existing Data, and Establishment of Data Base: Inventories on existing conditions and facilities

1) Natural conditions and geographical features
2) Socio-economic conditions
3) Population
4) Health status
5) Environmental conditions
6) Existing facilities and service coverage
   - Water Supply
   - Sanitation and Sewerage
7) Existing sector arrangements and institutional capacity
   - Sector institution

- Current community development and training approaches
- Existing sector monitoring systems

8) Past financial performance in the sector development

(2) Long-Term Development Plan

1) Projection and assumption of planning framework: projection of population and relevant frame values, and targets of the sector plan
2) Service coverage by target year
   - Water Supply
   - Sanitation and Sewerage
3) Water source development
4) Service expansion plan
5) Estimation of project cost
6) Investment program

(3) Medium-Term Investment Plan (5-year)

1) Facilities and equipment, and rehabilitation required to meet the target services
2) Identification of priority projects
3) Sector management plan
   - Institutional arrangements
   - Community development and training
   - Procurement, construction and operation and maintenance
   - Sector coordination
4) Estimation of project cost
5) Financial arrangements
   - Sources of fund
   - Additional funding requirements
   - Investment need ranking of municipalities
   - Implementation arrangements
   - Cost recovery

(4) Monitoring for Evaluation of Provincial Plan Implementation

1.2.3 Financing of Sector Plan

The First Water Supply, Sewerage and Sanitation Sector Project (FW4SP) has been implemented with financial assistance of the World Bank (IBRD). With reference to the Project, the technical assistance to help Provincial Government prepare 37 provincial sector plans in Luzon area is financed by various bilateral and multilateral agencies. Among them, nine (9) provinces including Batanes province are assisted by the Japan International Cooperation Agency. The PW4SP will be the basis to permit execution of the sector development from the proceeds of the IBRD financed sector loan and other donors in addition to LGUs budget and internal revenue allotment from National Government.

1.3 The Provincial Plan for the Province of Batanes

1.3.1 Preparation of the Plan

The PW4SP for the Province was prepared by a Provincial Sector Planning Team (PSPT) organized by the provincial government consisting of the Provincial Planning and Development Coordinator (PPDC), Provincial Local Government Operations Officer (PLGOO), planning and development officers from PPDO, and staff members from Provincial Engineers Office (PEO) and Provincial Health Office (PHO). Preparation of the plan was also assisted by the Department of the Interior and Local Government (DILG), the Department of Public Works and Highways (DPWH), the Department of Health (DOH), the Local Water Utilities Administration (LWUA), the National Economic and Development Authority (NEDA), and other national line agencies as well as Non-Government Organizations (NGOs) active in the sector. The PSPT was assisted in the preparation of the plan by the JICA Study Team through technical grant assistance from the Japanese Government (refer to Minutes of Discussions between DILG and JICA, and Figure 1.3.1 Organization Chart, 1.3.1 Preparation of the Plan, Supporting Report).

The PW4SP has been prepared at municipal level covering all sub-sectors for each municipality of the Province.

The report consists of three (3) volumes: I - Summary Report, II - Main Report and III - Supporting and Data Report.

1.3.2 Outline of the Report

The PW4SP is a framework plan that would serve as the basis for the future implementation work in the sector. It will be carried out either as large scale projects funded by international agencies or as a small size project carried out by local parties. It should be noted that the PW4SP is a sector development plan for the entire province and that it does not include detailed planning of individual projects. The individual projects will commonly cover selected sub-sector/s for limited areas and detailed planning/design work has to be conducted for the respective projects before start of construction work. The planning process is presented in Figure 1.3.1 and the following are the contents of the Main Report (List of data and information collected is included in 1.3.2 Outline of the Report, Data Report).

Chapter 2 describes the planning approach for the sector development, which guides the preparation of the plan: the background and rationale for provincial planning, and a planning tool that would rely heavily on local participation and flexible to improve planning and implementation.

Chapter 3 provides provincial profile with reference to current sector conditions: natural conditions and geographical features, socio-economic conditions, demographic trends, health status and environmental conditions as the planning environment.

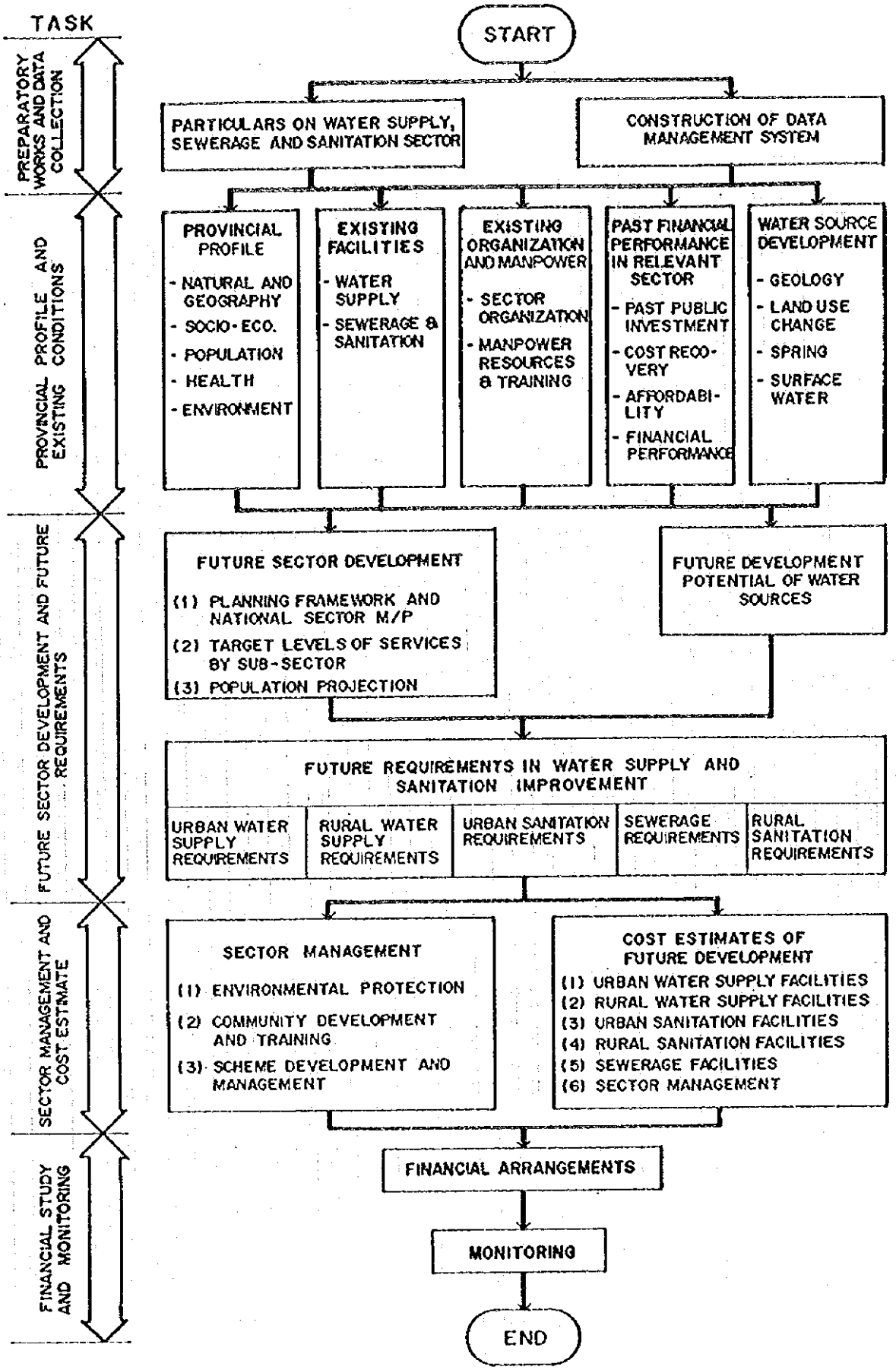
Chapter 4, 5, and 6 provide existing sector conditions in physical, managerial and financial aspects: existing water supply and sanitation facilities by service level and service coverage; sector institutions, community development, training and monitoring systems; and financial performances entailing cost recovery and affordability, which are the basis and references to come up with future development plan.

Chapter 7 analyzes the possibility of water source development for the water supply component: geological and hydrological conditions in the province, and future development potential of different water sources.

Chapter 8, 9 and 10 develop the Long-Term Development Plan and the Medium-Term Investment Plan both for physical and sector management requirements. Emphasis is placed on the sector management entailing institutional arrangements, community development, training and project implementation needs. Required costs for physical and institutional elements are also presented according to the implementation arrangements.

FIGURE 1.3.1

FLOW DIAGRAM OF SECTOR PLANNING



Chapter 11 presents financial arrangements based on identified sources of fund. The shortfall in terms of finance is shown to meet provincial targets established for the Medium-Term Investment Plan. Manner of national budget (IRA) allocation to municipalities by sub-sector is illustrated and trial calculation was made for the target year. Investment need ranking of municipalities as a factor of financial allotment is considered based on synthetic evaluation of sector components. Cost recovery by both beneficiaries and LGUs is also discussed.

Chapter 12 provides recommendations on monitoring of implemented projects covering procedures and responsibilities in different administrative levels. Periodic monitoring will allow for the updating of the PW4SP and modification of respective projects both in quality and quantity.

1.4 Acknowledgments

The Provincial Sector Planning Team (PSPT), responsible for the preparation of the PW4SP, acknowledges the extended cooperation, support and assistance in sharing essential data and planning principles by the Department of the Interior and Local Government (DILG), and other national, regional, provincial, municipal and/or city, and barangay institutions (List of individuals and their corresponding offices who directly participated in the preparation of the plan is included in 1.4 Acknowledgments, Data Report). The Japanese Government through JICA has generously provided technical assistance to the PSPT throughout the course of the planning work.

Chapter 2

PLANNING APPROACH FOR FUTURE SECTOR DEVELOPMENT

2. PLANNING APPROACH FOR FUTURE SECTOR DEVELOPMENT

2.1 General

The primary basis of the PW4SP is summarized referring to national sector policy and strategies as well as major legislation and regulations relevant to the sector. Planning framework is also discussed with reference to key measurable targets. Guiding principles for preparation of the plan are described in application of computer-aided planning approach.

2.2 Planning Framework

The GOP, through the *Water Supply, Sewerage and Sanitation Master Plan of the Philippines 1988-2000* and the Medium Term Philippine Development Plan (MTPDP): 1993-98, has manifested its commitment to the development of safe and dependable water supply and sanitation facilities. Policies and investment programs are compiled in these documents which lay out the basis of a strategy to accelerate sector development through the equitable mobilization of resources between urban and rural areas and institutional reforms at all government levels. Guiding principles set in the MTPDP include: decentralization; private sector-led development; democratic consultation; full cost recovery; social equity; and macro-economic stability.

According to MTPDP targets for the year 1998, the population served with potable water shall be increased up to 79% (57.1M). This corresponds to 71% (9.1M) of the Metro Manila population; 71% (15.5M) in other urban areas, and 85% (32.5M) in the rural areas. Sewerage facilities in Metro Manila and other highly urbanized areas will be constructed. About 1.8 million toilets will be built nationwide.

Given these MTPDP targets, as well as the goals set in the 1988 National Sector Master Plan, the current indications and the planning cycle adopted for this provincial sector planning, the national targets as shown in Table 2.2.1 will be used as the basis for setting the provincial targets.

Table 2.2.1: National Sector Coverage Targets

Sub-Sector	Year 1992	Year 2000[1]	Year 2010[2]
Urban Water Supply	47%	71%	93%
Rural Water Supply	80%	85%	95%
Sanitation	77%	93%	94%

Note: [1]Based on the 1998 MTPDP targets.
[2]Based on the long-term targets set in the previous National Sector Master Plan.

2.3 Sector Objectives

The objectives of the sector are:

(1) To provide safe and adequate water supply and sanitation to meet basic needs;

(2) To pursue proper O & M of facilities for sustainable water supply;

(3) To undertake the phased construction and installation of sewerage facilities; and

(4) To develop the capabilities of LGUs to implement water supply, sewerage and sanitation programs with the national government providing assistance in the areas of community participation, sub-sector planning, program management, regulation of development, selection of technologies, financial management, construction supervision, monitoring and reporting.

2.4 Current Sector Policies and Strategies

(1) One clear policy shift has been towards the promotion of **self-reliance** and **local community management** of services. Since the seventies, formation of local water districts in provincial urban areas has been aggressively pursued. During the eighties, this shift was further induced with the establishment of community-run BWSAs and RWSAs to provide services in smaller rural and peri-urban areas.

(2) An **integrated approach to water, sanitation and hygiene education** has been prescribed in order to achieve full health benefits of improved services. The GOP promotes intensified health education and information programs to improve hygiene practices at the household level.

(3) **Cost recovery** of capital and O & M is promoted in urban areas for piped water systems; partial recovery of operating costs in rural and low-income areas is advocated. This is a clear switch from subsidies which characterized previous strategies. Current priorities also stress the need to improve collection of water tariffs.

Reviews of previous projects have repeatedly highlighted the need to focus on **sustainability** of the projects through a truly **demand-driven** and community-based approach.

(4) **Private sector participation** is encouraged to bring into the sector business principles and practices and private capital to accelerate social and economic development; to

improve sector efficiencies; and to ease the burden on the GOP's budget and foreign borrowing.

(5) **An integrated water resources strategy** has been adopted in areas combining irrigation, power, flood control, and domestic and industrial water supply. Small and medium scale water resources projects through the active participation of the populace are encouraged. **Watershed management**; water conservation and erosion and sediment control are deemed critical.

2.5 Major Legislation and Regulations Affecting the Sector

(1) The **Local Government Code of 1991** (RA 7160) provides for a more responsive and accountable local government structure. Local government units now exercise more authority and responsibilities and provide resources to accelerate the provision of basic services and facilities, including water supply, sanitation and sewerage. The Implementing Rules and Regulations (IRR) to effect the devolution of water and sanitation responsibilities and resources are under preparation.

(2) The **Water Code of the Philippines** (PD 1067) consolidates legislation relating to the ownership, development, utilization, exploitation and conservation of water resources. The Code established the basic principles and framework on the appropriation, control and conservation of water resources to achieve their optimum economic efficiency and rational development. In addition, PD 424, declares that the National Water Resources Board (NWRB) shall be responsible for coordinating and integrating all activities related to water resources. PD 1067 also pertains to the grant of water right privileges (water permits) to appropriate and use water. Water permit applications are reviewed and granted by the NWRB.

(3) The **Provincial Water Utilities Act of 1973** (PD 198) authorizes the formation of local water districts in the provincial areas outside the Metropolitan Manila area, and provides for their administration and operation. It also created the Local Water Utilities Administration (LWUA) as a specialized lending institution for the promotion, development and financing of local water districts.

(4) The **Metropolitan Waterworks and Sewerage System (MWSS) Charter** (RA 6234) was enacted in 1971. The utility was formed to take over the facilities of NAWASA in

1971. The Charter was amended by PD 1046 expanding further its territorial jurisdiction to include areas that may be included in the growing metropolis.

(5) The **Philippine Environmental Policy** (PD 1151) requires all public and private entities to undertake an environmental impact assessment of all projects which significantly affect the quality of the environment. The **Philippine Environmental Code** (PD 1152) establishes standards for air and water quality, and guidelines for land use management, natural resource management and conservation, utilization of surface and groundwater, and waste management.

(6) The **Sanitation Code (1975)** was promulgated to deal with water supply, excreta disposal, sewerage and drainage issues. The Sanitation Code and the **National Building Code (1977)** require that new buildings be connected to a water-borne sewerage system. Where such systems do not exist, sewage must be disposed of onto Imhoff tanks or septic tanks with a subsurface absorption field. In addition, the facilities are required to conform with the **1959 National Plumbing Code.**

(7) The **1981 Rules and Regulations for Domestic Wastewater Disposal** require all subdivisions and condominiums, etc. to have adequate sewage collection, conveyance, treatment and disposal facilities. A permit must be obtained prior to commissioning a new system.

2.6 Planning Principles and Data Management

2.6.1 Planning Principles

The PW4SP shall be prepared to ensure that the sector investments are optimized under the constraints of funds and water source availability as well as planning capability. Furthermore, the plan shall ensure its sustainability at the provincial level. The overviews of the plan will be progressively adjusted and refined at different detailed implementation stages. Accordingly, the demarcation is a prerequisite between a sector plan and succeeding detailed plan/s. Specifically, the following are required as planning principles.

(1) The plan is conceived to be flexible, consistent and as simple as possible to respond to the changing socio-economic conditions of the province, accumulated technical information and updated policy of local governments allowing for periodic upgrading.

(2) The plan is arranged to allow planners to run different scenarios for project implementation, especially with reference to the interface between the provincial plan (break-down) and project proposals from municipalities (bottom-up).

(3) The plan is conceived to be adaptable to the local planning capacity and to ensure its full "ownership" by LGUs.

In addition, the following shall be taken into account to help the provincial planners perform their tasks.

(1) The plan follows existing provincial and municipal planning routines to minimize duplicated planning activities. It is essential to maintain and extend the involvement of local officials for data collection.

(2) The plan, as a comprehensive tool, considers the consistency to derive the next level of planning.

(3) The plan entails monitoring and evaluation of actual implementation progress, as investments are undertaken.

The guideline for preparation of the PW4SP is included in the Planning Approach for Future Sector Development, Data Report. It identifies all tables and figures with respective forms by main, supporting and data report.

2.6.2 Data Management

The data management system was established to come up with the basic outputs commensurate to the objectives of the provincial plan and at the same time reflect the planning approach mentioned above. It will provide a map of relative needs in the province allowing for adjustment and updating when further information becomes available. Monitoring and evaluation are to be done using the tool, thereby serving as baseline information for the improvement of planning and implementation. Different scenarios may be worked out by planners using the program in application of variable parameters.

The need for full and continuous involvement of local officials is indispensable to establish a reliable database.

(1) Computer-based system

Data management system is designed to perform simple and direct interfaces in data processing. Since a limited number of municipalities is the planning level entailing data collection from the administrative units, EXCEL was selected to facilitate data storage, retrieval, updating and processing.

The data storage system was arranged to parallel the structure of questionnaires and contain the same system of logical categories under institutional hierarchical system of the Philippines (refer to Figures 2.6.1 and 2.6.2). Data are encoded into the hierarchical level.

A series of EXCEL routines was established to allow summaries and consolidation of data into the forms required for analysis and presentation. Details are included in 2.6.2 Data Management, Supporting Report (Questionnaire Forms together with User's Guide for Computer-Aided Planning are referred to 2.6.2 Data Management, Data Report).

(2) Key Parameters

Establishment of criteria and assumptions are requisites in the planning process. In this connection, key parameters are identified to allow for preparation of alternative plans and updating in accordance with sector improvement policy in the future. The parameters for relevant sub-sectors are assumed on an urban and rural basis for respective municipalities referring to current conditions and practices on national and provincial levels. The following are selected parameters in this context.

1) Number of households to be served by a Level I facility
2) Safe and unsafe percentages of Level I facilities
3) Standard number of students to be served by a unit of sanitary toilet
4) Standard number of toilets for a public utility
5) Provincial sector targets by sub-sector
6) Composition of different types of toilets
7) Per capita water consumption for Level III system
8) Composition of different types of well sources and their specifications
9) Percentage of Level I wells to be rehabilitated
10) Unit construction cost of different facilities per person/household/facility/system
11) Percentage of sector management cost to construction cost
12) Physical and price contingencies
13) Unit recurrent cost of different systems/facilities
14) Allocation factors/percentages of IRA

Figure 2.6.1 Institutional Hierarchical System of the Philippines

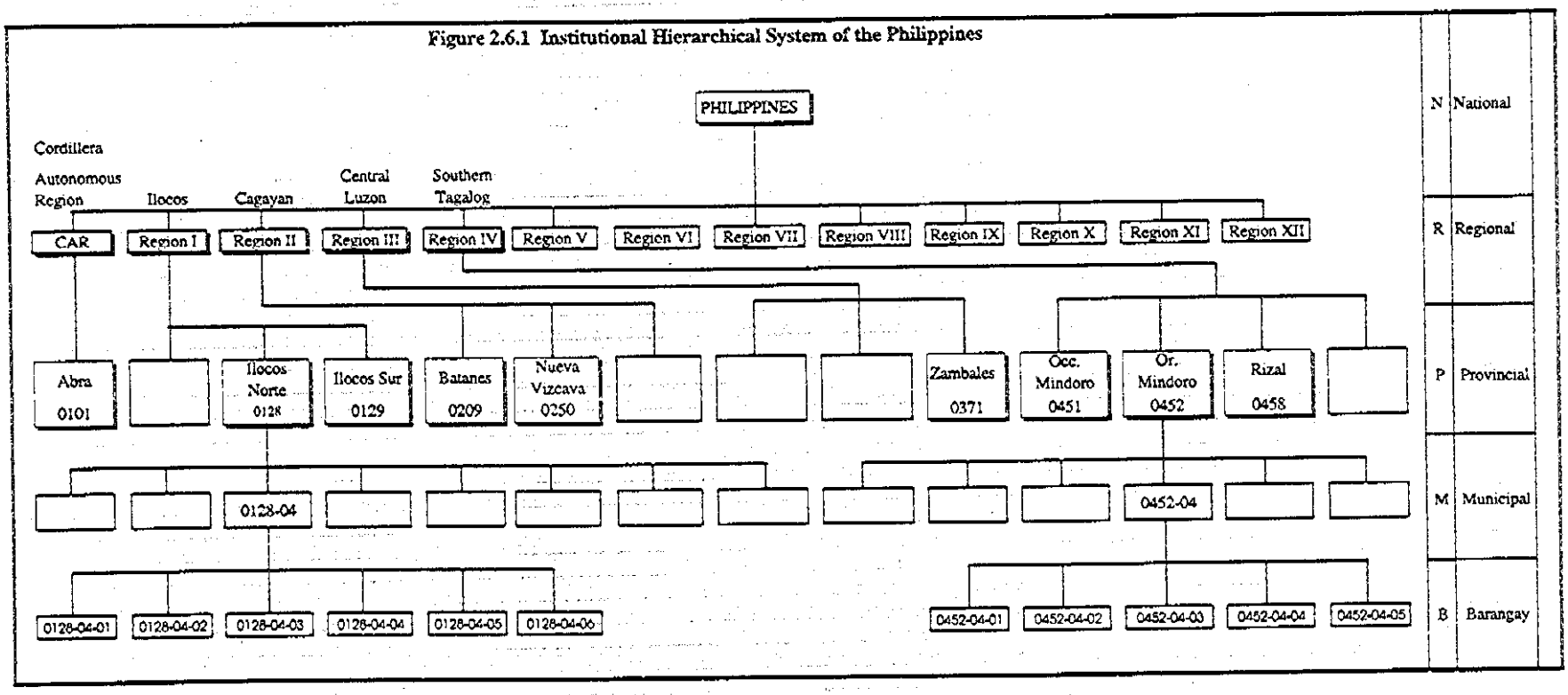


Figure 2.6.2 Structure of Questionnaire

Grouping of Data	Data Collection Level					
	Nat. N	Reg. R	Prov. P	Mun. M	Bar. B	Sys. S
1 SOCIO ECONOMIC CONDITIONS						
1.1 Area and Population			P 1.1	M 1.2		
1.2 Past Population			P 1.2.1	M 1.2.1		
			P 1.2.2	M 1.2.2		
1.3 Projected Population			P 1.3	M 1.3		
1.4 Household Number			P 1.4	M 1.4		
1.5 Services			P 1.5	M 1.5		
1.6 Occupation Category			P 1.6	M 1.6		
1.7 Family Income, Education and Literacy			P 1.7	M 1.7		
2 LAND USE						
2.1 Existing Land Use			P 2.1	M 2.1		
2.2 Future Land Use			P 2.2	M 2.2		
3 HEALTH						
3.1 Morbidity and Mortality			P 3.1	M 3.1		
3.2 Facility and Practioner			P 3.2	M 3.2		
4 WATER SOURCE						
4.1 General Information			P 4.1	M 4.1		
4.2 Water Source			P 4.2	M 4.2		
5 WATER SUPPLY SYSTEMS						
5.1 Level II Systems						S 5.1.1
						S 5.1.2
5.2 Level III Systems						S 5.2.1
						S 5.2.2
						S 5.2.3
						S 5.2.4
6 ENVIRONMENTAL SANITATION						
6.1 Private Toilet			P 6.1	M 6.1		
6.2 School/Public Toilet			P 6.2	M 6.2		
6.3 Drainage Facility			P 6.3	M 6.3		
6.4 Solid Waste Collection and Disposal			P 6.4	M 6.4		
7 INVESTMENT						
7.1 Previous Annual Investment			P 7.1			
7.2 Planned Annual Investment			P 7.2			

15) Funding levels/percentages for different financing scenarios

16) Scoring factors for municipal investment ranking

17) Annual distribution of investment cost (medium-term development)

These parameters are not included in the database program, since they are to be established through sensitivity analysis. Assumed figures are directly entered into a separate spreadsheet that is linked to the output files.

(3) Data Processing

Collected data are entered into the forms constructed in EXCEL database. The data are consolidated into final forms in application of small programs prepared for this planning. Linked outputs in tables and graphics are prepared in EXCEL spreadsheets for final analysis and presentation. Key parameters are entered in a key parameter table linked to the output tables (refer to 2.6.2 Data Management, Supporting Report).

Data in the questionnaire forms (database) are transferred to the output tables for final calculations. Adjustments are made through manipulation of the key parameter table.

Chapter 3

PROVINCIAL PROFILE

3. PROVINCIAL PROFILE

3.1 General

Batanes is the northernmost province of the country and consists of tiny islands. It is about 280km north of Aparri, Cagayan, the nearest municipality in mainland Luzon. The islands are surrounded on the north and south by the Balintang and Bashi Channels, respectively, on the east by Pacific Ocean, and on the west by South China Sea. Figure 3.1.1 presents the Location Map.

Being the smallest province of the country, it has a total land area of 209.82sq.km that is a mere 0.07% of the Philippine total land area of about 300,000sq.kms. It is composed of 6 municipalities with Basco as the provincial capital. There are 29 barangays, of which 6 are urban and 23 rural. Provincial total population was 15,026 in 1990. About 66% of the population resided in rural areas, while the remaining 34% in urban areas. At present, there are 5 municipal waterworks and 1 Level III system (managed by RWSA) in the province. Table 3.1.1 presents the breakdown per municipality of the land area, population and its density, as well as administrative composition.

Table 3.1.1 Outline of Municipalities

Municipality		Land Area (sq.km)	1990 Population		Number of Barangay		
Code	Name		Number	Density (person/sq.km)	Urban	Rural	Total
020901	Basco	35.45	5,729	162	3	3	6
020902	Itbayat	90.53	3,448	38	0	5	5
020903	Ivana	16.55	1,190	72	0	4	4
020904	Mahatao	10.96	1,724	157	1	3	4
020905	Sabtang	40.59	1,737	43	2	4	6
020906	Uyugan	15.74	1,198	76	0	4	4
Provincial Total		209.82	15,026	72	6	23	29

Note: Municipal Code corresponds to NEDA Geographic Coding System.

3.2 Natural Conditions and Geographical Features

3.2.1 Meteorology

Batanes has Type IV climate under the Coronas classification and is characterized by unpronounced dry and wet seasons as reflected in Figure 3.1.1, Location Map. Rainfall is evenly distributed throughout the year. Using the 30-year (1961-1990) records of the Basco meteorological station, the mean annual average precipitation is registered at 2,769mm.

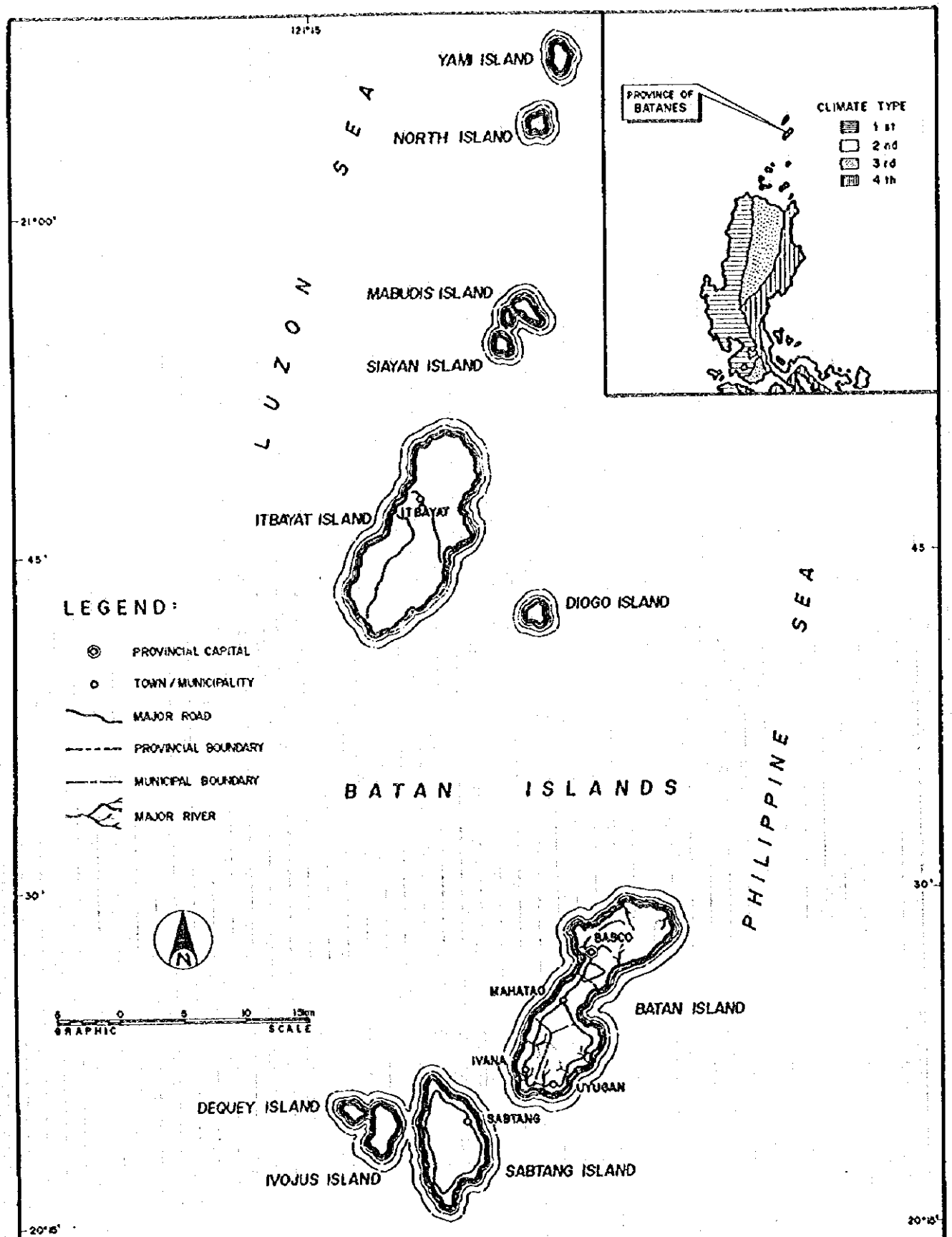


FIGURE 3.1.1
LOCATION MAP
PROVINCE OF BATANES

Also, rainfall records in Itbayat station indicated a mean annual precipitation of 3,227mm. Rainfall occurs every month with a minimum of 8.5 days and a maximum of 21.2 days.

The province is relatively cool compared to the rest of the country because it is located in the upper boundary of the Tropic of Cancer. The average mean temperature ranges from 23°C in December and January to 29°C in July. Minimum temperature recorded (1987-1991) was 14.5°C and the maximum was 37.6°C that occured only once. Batanes lies in the typhoon path of the country. Typhoons occur in any month, but are more regular and frequent during the months of June to September and sometimes, extend up to November.

3.2.2 Land Use

Forest area constitutes about 47% of the total area of the province. Agricultural and Pasture lands comprise about 52%, while Built-up area is limited to a mere 0.40%. The settlements are concentrated only in the 3 largest islands of Batan, Itbayat and Sabang. The existing land use pattern as presented in Table 3.2.1 depicts a sustainable growth deserving and enhancing its present trend. The forest that still remain primarily serves as watershed rather than as source of timber. An efficiently managed watershed collects and regulates flow of water, controls soil erosion and minimizes water pollution. Conversion of forest lands to other uses will restrict its function as a watershed. Correspondingly, a significant increase in agricultural area will result in a high demand of water for agricultural use.

Table 3.2.1 Current Land Use

Land Use	Area (sq. km)	Percentage over Total Land Area
Forest Land	99.45	47.40
Agricultural/Pastureland	109.33	52.20
Built-up	0.99	0.40
Mangrove, Fishponds, In-land Water Areas and Openlands	0.05	0.00
TOTAL	209.82	100.00

3.2.3 Topography and Drainage

The islands and islets of the province are either volcanic mounds or uplifted coral reef with contrasting morphological expressions. Its 4 largest islands: Batan, Sabtang, Itbayat, and Ivojus make up about 93% of the provincial total land area. Batan is a volcanic island with rolling to

rugged topography. The island has the 2 most prominent peak in the province: Mt. Iraya with an elevation of about 1,008m above mean sea level, and Mt. Matarem, about 453m high. Each of the 2 promontories has streams and divides that radiate from the peak. These streams drain directly into the Philippine Sea. The coastline of the island is relatively regular.

Just like Batan, Sabtang is also a volcanic island. It has small flat areas spread occasionally along the coast, while the interior is dominated by steep mountains and deep canyons. Mt. Alapadon is the highest mountain with a peak elevation of about 340m. The island is well-drained by short streams radiating from the mountains.

Itbayat island is an uplifted coral reef. It has a karstic topography characterized by numerous cliffs and depressions. The island has gently rolling hills and nearly level areas on semi-plateaus surrounded by continuous massive cliffs rising from 20 to 70m above sea level, with no shorelines. Prominent reliefs are Mt. Santa Rosa (278m) and Mt. Ripose (231m). The drainage system of the island has no distinct pattern. The streams flow directly to the sea.

Ivojus island has low topography with highest point of about 90m above mean sea level. It has generally rolling surface expressions. The island has short streams that discharge directly into the sea.

3.3 Socio-economic Conditions

3.3.1 Economic Activities and Household Income

Agriculture is the major economic activity in the province. Major crops cultivated are rootcrops, bulb crops and vegetables. Cattle production and trading to mainland Luzon are also important activities. The greater bulk of commercial activities is seen in Basco. Tourism is also one of the promising economic activities in the province.

The National Statistics Office (NSO) Family Income and Expenditures Survey in 1991 showed that the mean annual family income of the province was ₱ 93,158, while the median was at ₱ 66,083. The provincial government questioned the accuracy of these figures and is now being resolved. Meanwhile, it was decided that the 1988 survey figures be adopted in this plan. According to this survey, the mean annual income was ₱ 31,701. Distribution of households by income class in the region and province is shown in Figure 3.3.1 (refer to

Table 3.3.1, Supporting Report). Based on the established poverty threshold income of ₱ 30,912 in Region II for 1988, about 49% of the total number of families lived within and below the poverty threshold.

As to the number of workers by major industry group, agriculture, fishery and forestry had the dominant share followed by community, social and personal services, and wholesale and retail trade (refer to Table 3.3.2, Supporting Report). By major occupation group, farmers, forestry workers and fishermen had the highest share of 49%, followed by elementary occupations as indicated in Figure 3.3.2.

3.3.2 Basic Infrastructure

Electric supply and telecommunication service cover 67% and 100% of the municipalities, respectively. There are 6 post offices or stations in the province. Land transportation is available by means of jeepneys and motorcycles. The province has 2 secondary and feeder airports and 3 commercial seaports. There are 391 business establishments and 5 tourism facilities. Table 3.3.1 presents a provincial outline of public services and Table 3.3.2 reflects the number of public facilities and services by municipality (refer to Table 3.3.1, Data Report).

3.3.3 Education

The province has a total of 26 schools consisting of 18 elementary schools, 6 high schools, and 2 colleges/vocational institutions. The 1990 NSO census indicated that the province had a 96% literacy of household population 10 years old and over. A large part of the population had attained elementary or high school levels of education as reflected in Figure 3.3.3 (refer to Table 3.3.3, Supporting Report).

3.4 Population

3.4.1 Previous Population Development

A fluctuating provincial population growth rate had been experienced since the last six (6) census years (1948-1990) as indicated in Figure 3.4.1. From an average annual growth rate of 1.83% during the period 1948 to 1960, it drastically decreased to 0.37% (1975-1980) and recovered to 2.20% (1980-1990). A summary of the annual average growth rates is as follows:

Figure 3.3.1 Distribution of Households by Income Class

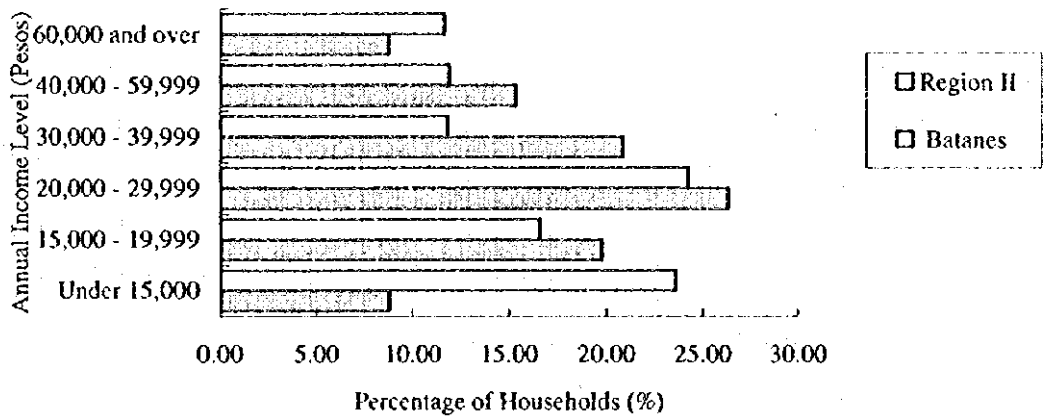


Figure 3.3.2 Population Distribution by Occupation

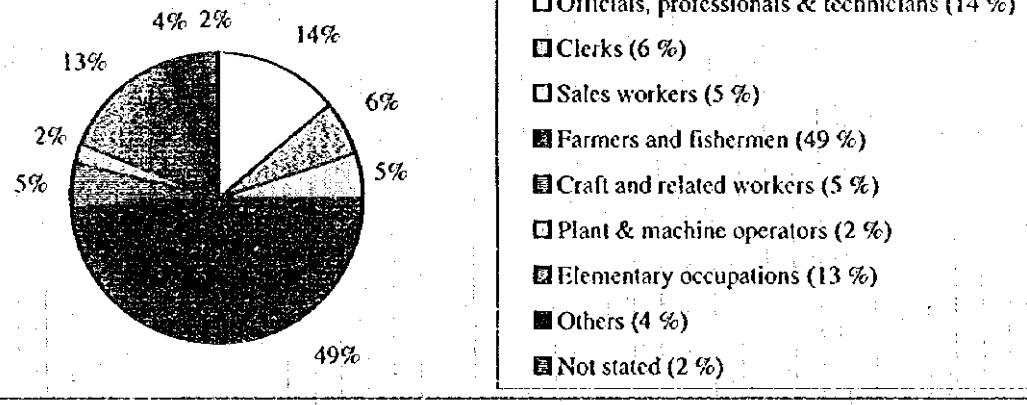


Figure 3.3.3 Population Distribution by Highest Attainment of Education

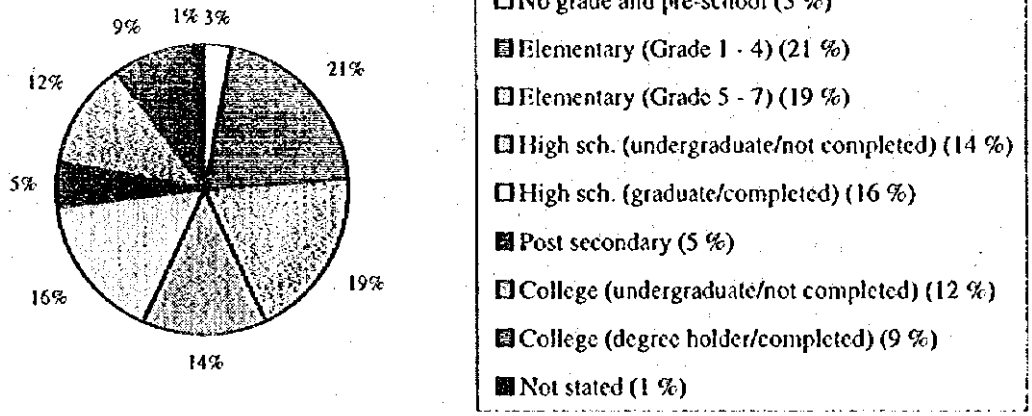


Table 3.3.1 Provincial Outline on Public Services

Items	Unit		Items	Unit	
(1) Roads			(7) Industrial/Business/Commercial Establishment	Number	391
a) Total Length	km	293.10			
b) Barangay roads	Percent	55.9	(8) Tourism Facilities (Hotel, lodges, resorts, etc.	Number	5
(2) Electricity Service Coverage					
a) Municipality	Percent	66.7			
b) Barangay	Percent	83.3	(9) Schools		
c) Household	Percent	42.2	a) Primary level	Number	18
			b) Secondary level	Number	6
(3) Telecommunication Services			c) Tertiary level	Number	2
a) Availability in municipality	Percent	100			
b) Telegraph station	Number	1	(10) Health Facilities		
c) Telephone station	Number	1	a) Hospital/clinics	Number	2
			b) Main health centers, rural health units, barangay health center, etc.	Number	12
(4) Post Office	Number	6			
(5) Transportation Services	Mode (ex. Bus, jeep, taxi)	Motorcycle, Jeepneys, 2 Airports, 3 Commerical Ports	(11) Labor		
			a) Labor force participation ratio	Percent	78.1
			b) Employment rate	Percent	97.5
			(12) Average Family Income		
			a) Monthly income	Pesos/Month	2,642
(6) Banking Facilities	Number	2	b) Monthly expenditure	Pesos/Month	1,833
a) Private bank	(by Private	(Private)			
b) Public bank	and public)				

Sources:
PSPT, Provincial Socio-economic Profile Development Plan, 1990 Population Census, 1988 Family Income and Expenditures Survey-NSO

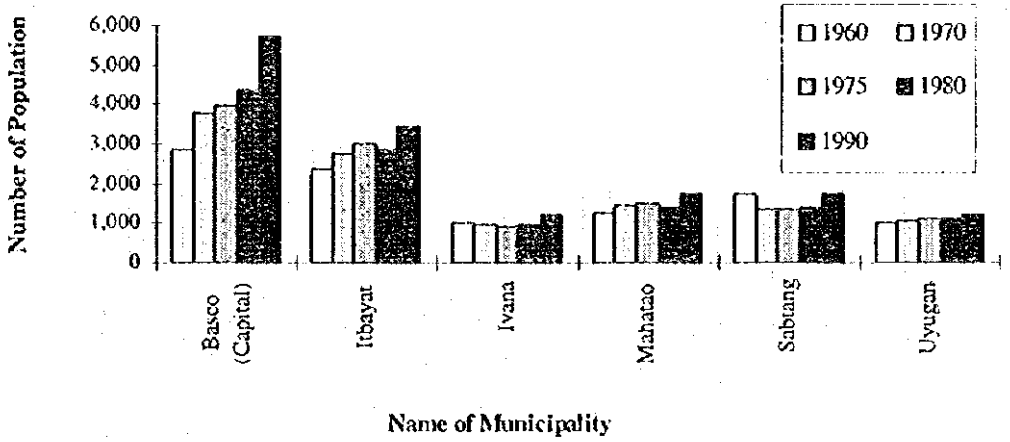
Table 3.3.2 Public Facilities and Services by Municipality

Municipality	High School			College	Hospital	Public Market	Bank	Annual Growth Rate of Population (1980-1990)
	Public	Private	Total					
	nos.	nos.	nos.	nos.	nos.	nos.	nos.	Percent
Basco	1	0	1	2	1	1	2	2.8
Itbayat	1	0	1	0	1	0	0	1.9
Ivana	1	0	1	0	0	0	0	2.0
Mahatao	1	0	1	0	0	0	0	2.2
Sabtang	1	0	1	0	0	0	0	2.1
Uyugan	1	0	1	0	0	0	0	0.7
PROVINCIAL TOTAL	6	0	6	2	2	1	2	2.2

Year	Population	Annual Ave. Growth Rate (%)	Period
1960	10,309	1.83	1948 - 1960
1970	11,398	1.01	1960 - 1970
1975	11,870	0.81	1970 - 1975
1980	12,091	0.37	1975 - 1980
1990	15,026	2.20	1980 - 1990

A consideration on how the population growth behaved in the past and how it is likely to behave in the future is important because of the issue of resource allocation including the water supply and sanitation sector requirements.

Figure 3.4.1 Previous Population Development of the Province



The 1995 population was estimated to provide the planning base for the Master Plan (refer to Section 8.3.1, Population Projection, Main Report). Table 3.4.1 shows a breakdown of the past population development by municipality including the 1995 projected population.

Table 3.4.1 Previous Population Development by Municipality

Municipality	Previous Population						Est. Pop.
	1948	1960	1970	1975	1980	1990	1995
Basco	3,312	2,868	3,757	3,984	4,341	5,729	6,636
Itbayat	1,954	2,365	2,760	2,978	2,859	3,448	3,787
Ivana	1,083	1,039	989	942	972	1,190	1,317
Mahatao	1,492	1,242	1,475	1,476	1,388	1,724	1,922
Sabtang	1,656	1,766	1,359	1,375	1,409	1,737	1,928
Uyugan	1,208	1,029	1,058	1,115	1,122	1,198	1,238
TOTAL	10,705	10,309	11,398	11,870	12,091	15,026	16,828

3.4.2 Classification of Urban and Rural Areas

NSO classifies a barangay as urban when it satisfies any of the following conditions on the economic and social functions.

(1) In their entirety, all municipal jurisdictions which, whether designated as chartered cities, provincial capital or not, have a population density of at least 1,000 persons per square kilometer.

(2) Poblaciones or central districts of municipalities and cities which have a population density of at least 500 persons per square kilometer.

(3) Poblaciones or central districts (not included in nos. 1 and 2) regardless of population size which have the following:

1) Street pattern, i.e., network of streets either at parallel or in right angle orientation;
2) At least six establishments (commercial, manufacturing, recreational and/or personal services); and
3) At least three of the following:
   a) a town hall, church or chapel with religious services at least once a month;
   b) a public plaza, park or cemetery;
   c) a market place or building where trading activities are carried on at least once a week; and
   d) a public building like school, hospital, puericulture and health center or library.

(4) Barrios/Barangays having at least 1,000 inhabitants which meet the conditions setforth in no. 3 above, and in which the occupation of the inhabitants is predominantly non-farming/fishing.

All areas not falling under the urban classification are defined as rural area. For this Master Plan, the 1990 NSO classification of urban and rural barangays was adopted by the PPDO. As stated earlier, there are 6 urban barangays and 23 rural barangays for a total of 29 barangays in Batanes. Distribution of the classified areas is shown in Figure 3.4.1, Supporting Report.

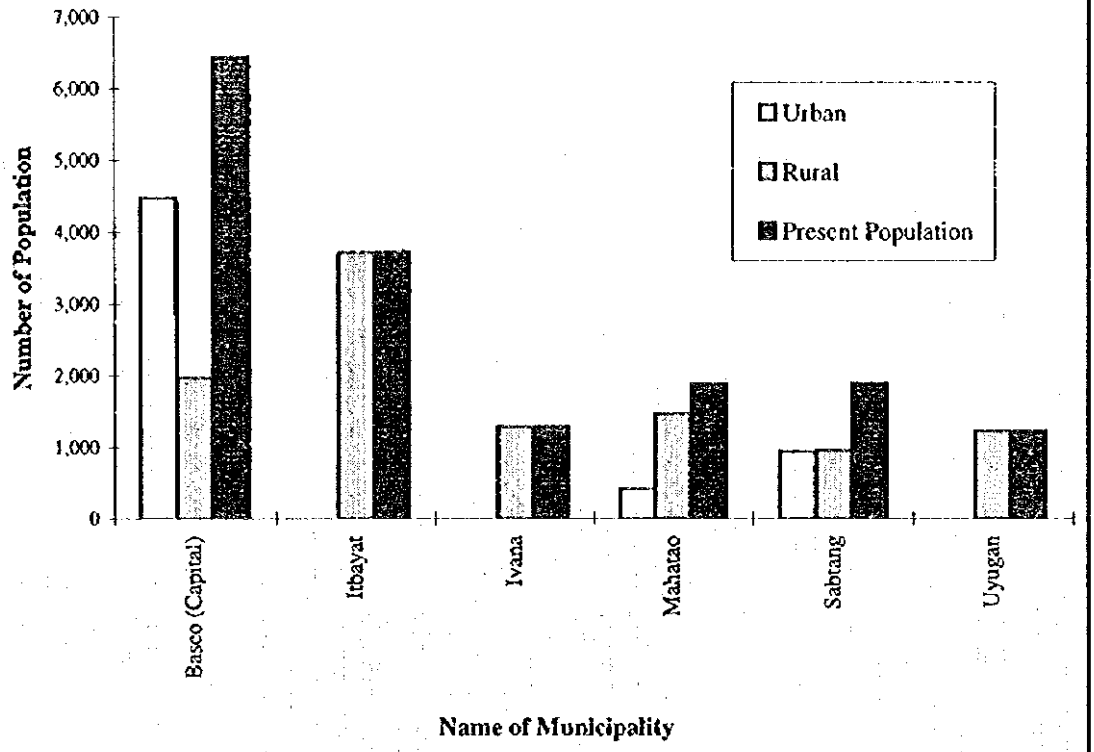
3.4.3 Present Population Distribution

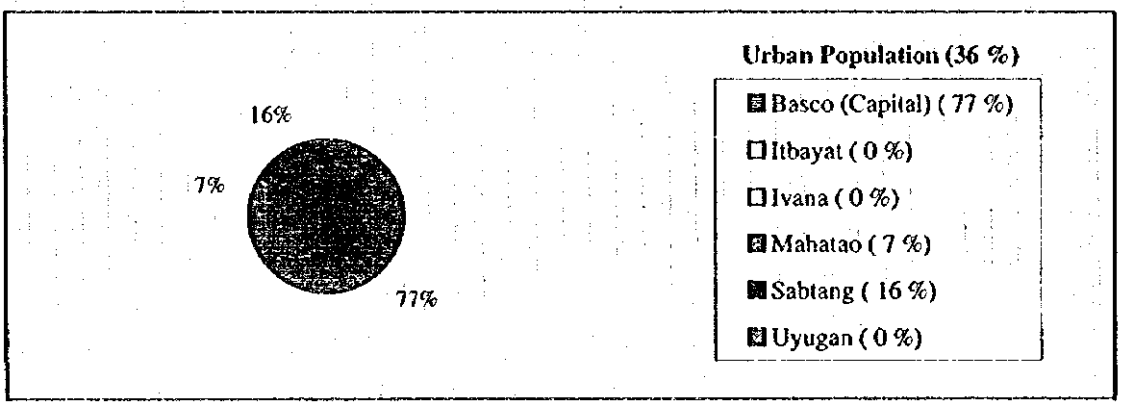
The 1995 urban-rural population was estimated using the 1990 census as the base figure. Rural population accounts for 66% of the provincial total, while the remaining 34% is urban as reflected in Figure 3.4.2. Table 3.4.2 presents the breakdown of the number of urban and rural barangays by municipality and its corresponding present population distribution.

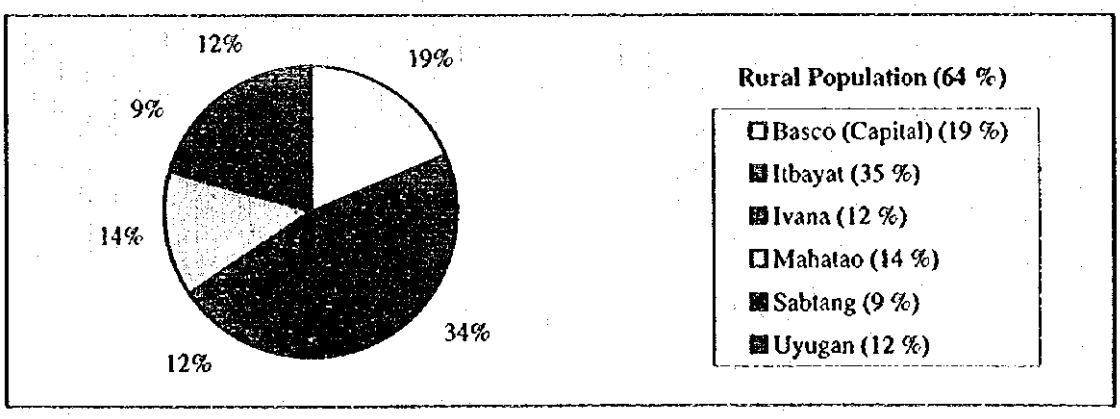
Table 3.4.2 Outline of Urban and Rural Areas in the Province

Municipality	Land Area (sq.km)	Number of Barangay			Population (1995)		
		Urban	Rural	Total	Urban	Rural	Total
Basco (Capital)	35.45	3	3	6	4,651	1,985	6,636
Itbayat	16.55	0	5	5	0	3,787	3,787
Ivana	90.53	0	4	4	0	1,317	1,317
Mahatao	10.96	1	3	4	424	1,498	1,922
Sabtang	40.59	2	4	6	953	975	1,928
Uyugan	15.74	0	4	4	0	1,238	1,238
Provincial Total	209.82	6	23	29	6,028	10,800	16,828

Figure 3.4.2 Present Population Distribution







There are 3,302 households with 2,141 residing in rural areas and 1,161 households in urban areas. The average provincial household size is 5.1. Table 3.4.3 presents a breakdown per municipality in the number of households and household sizes by urban and rural area.

Table 3.4.3 Household Numbers and Household Sizes

Municipality	Number of Households (1995)			Household Size (person / HH)		
	Urban	Rural	Total	Urban	Rural	Total
Basco (Capital)	891	392	1,283	5.2	5.1	5.2
Itbayat	0	742	742	0.0	5.1	5.1
Ivana	0	262	262	0.0	5.0	5.0
Mahatao	82	308	390	5.2	4.9	4.9
Sabtang	188	185	373	5.1	5.3	5.2
Uyugan	0	252	252	0.0	4.9	4.9
Provincial Total	1,161	2,141	3,302	5.2	5.0	5.1

3.5 Health Status

3.5.1 Morbidity, Mortality and Infant Mortality

The number one cause of morbidity was acute respiratory infection followed by skin diseases and influenza. Gastro-enteritis and bronchitis ranked fourth and fifth, respectively. Other causes of morbidity in descending order were: diarrhea, musculo-skeletal disorder, pneumonia, intestinal parasitism and anemias. Regarding mortality, the number one causes were pneumonia and heart diseases. Obstructive pulmonary/cardio-respiratory diseases and other accidents ranked second and third, respectively. Other causes include vascular diseases, PTB, malignant neoplasm, respiratory arrest, appendicitis and diseases of the nervous system. Suffocation of foreign body, anemias and vascular diseases were the 3 leading causes of infant mortality in the province.

The general health status of the populace of the province was relatively low as compared with the national condition. The incidence of diseases was higher in Batanes than the Philippines as a whole. Table 3.5.1 presents a comparative statistics on the ten leading causes of morbidity, mortality and infant mortality of the province as well as of the Philippines.

Table 3.5.1 Number and Rates of Ten Leading Causes of Morbidity, Mortality and Infant Mortality

Rate: 1/100,000

	Causes	Batanes		Philippines		
		Number	Rate	Number	Rate	Ranking
Morbidity	1. ARI	3,788	22,510.10	875,289	1,456.5	3
	2. Skin Diseases	1,413	8,396.72	-	-	-
	3. Influenza	775	4,605.42	694,956	1,156.4	5
	4. Gastroent. Colitis/BPU	714	4,242.93	894,116	1,487.8	2
	5. Bronchitis/Asthma	712	4,231.04	951,305	1,583.1	1
	6. Diarrhea	497	2,935.41	*	*	*
	7. Musculo-Skeletal Disorder	386	2,293.80	-	-	7
	8. Pneumonia	263	1,562.87	204,959	341.1	6
	9. Intestinal Parasitism	220	1,307.34	245,827	409.1	8
	10. Anemias	178	1,057.76	206,164	343.1	1
Mortality	1. Pneumonia	19	112.91	50,609	84.2	2
	2. Ill-Defined Condition/Mycardial Infaction	19	112.91	33,917	56.4	-
	3. Obstructive Pulmonary/Cardio-Resp. Distress	8	47.54	-	-	5
	4. Other Accidents	7	41.60	15,193	25.3	3
	5. Vascular Diseases	5	29.71	26,436	43.9	4
	6. Tuberculosis	4	23.77	20,949	34.9	6
	7. Malignant Neoplasms	3	17.83	14,723	24.5	-
	8. Respiratory Arrest	3	17.83	-	-	-
	9. Appendicitis	3	17.83	-	-	-
	10. Nervous System	2	12	-	-	-
Infant Mortality	1. Suffoc. Foreign Body	3	17.83	-	-	-
	2. Anemias	1	5.94	-	-	-
	3. Vascular Diseases	1	5.94	773	-	8
	4. Pneumonia	1	5.94	11,942	-	1
	5. Cardio-Pulmonary Arrest-Prematurity	1	5.94	-	-	-
	6. Prematurity	1	5.94	4,786	-	2
	7. Cardio-Respiratory Arrest	1	5.94	1,167	-	6
	8. Aspiration Pneumonia	1	5.94	949	-	7
	9. Dehydration/Severe Diarrhea	1	5.94	2,430	-	3

Water-related diseases in the ten leading causes of morbidity include skin diseases (rank 2), gastroenteritis (4th), diarrhea (6th) and intestinal parasitism (9th). Diarrhea also ranked 9th as the leading cause of infant mortality.

3.5.2 Water Related Diseases

An indicator of health problems related to water supply and sanitation is the incidence of water-related diseases. The World Health Organization (WHO) has classified diseases related to water into four (4) categories: 1) water-borne diseases e.g., cholera, typhoid, hepatitis A, diarrhea and dysentery; 2) water-based diseases e.g., schistosomiasis; 3) water-washed diseases e.g., diarrhea, intestinal parasitism, scabies, conjunctivities (sore eyes), and skin diseases; and 4) water-vector related diseases i.e., malaria, filariasis and dengue or H-

fever, although the control of malaria and filariasis is beyond the scope of this Master Plan. A safe water supply, sanitary latrine and proper hygiene practices are conditions necessary for the control and prevention of these diseases.

Water-related diseases reported in the province were skin diseases, gastroenteritis, diarrhea and intestinal parasitism. Table 3.5.2 presents the reported cases and deaths of notifiable water-related diseases in the province.

Table 3.5.2 Reported Cases and Deaths of Notifiable Water Related Diseases

Rate: 1/100,000

Diseases	Morbidity		Mortality		Infant Mortality	
	Number	Rate	Number	Rate	Number	Rate
Water-borne						
1. Diarrhea	497	2,953.41	0	0.00	1	5.94
2. Gastroent. Colitis	714	4,243.92	0	0.00	0	0.00
Water-washed						
1. Intestinal Parasitism	220	1,307.34	0	0.00	0	0.00
2. Skin Diseases	1,413	8,396.72	0	0.00	0	0.00

3.5.3 Health Facilities and Practitioners

Present facilities servicing the health care of the population are 2 hospitals/clinics, 6 rural health units and 6 barangay health stations. The number and ratio to population of health facilities and/or medical practitioners in the province as well as in the Philippines are presented in Table 3.5.1, Supporting Report.

3.6 Environmental Conditions

3.6.1 General

Environmental issues and problems directly affecting the sector and/or how the sector affects these environmental concerns are dealt with in this sub-section. Specifically, the problems of water pollution and solid waste disposal spawned by rapid population growth and increasing industrial and economic activities are discussed. These problems put a strain on the provincial water resources and hinder their optimum utilization.

3.6.2 Water Pollution

There is no existing sewerage system in the province. Majority of the drainage facilities in all municipalities are open canals or ditches. The streams function as the drainage system. These streams receive the domestic wastewater and storm water collected by the segmented drainage facilities in urban centers or poblacions.

A major water pollution source in urban areas is domestic wastewater. Graywater generated by households is simply allowed to discharge into nearby channels. Effluent from septic tanks/cesspool is also flowing into the streams. The other major pollutant is dumped refuse that finds its way to the waterbodies during rain or is thrown indiscriminately into the rivers and seashores. In rural areas, natural assimilation may be expected to purify organic substances. However, pollution or contamination is anticipated caused by agricultural activities especially with reference to fertilizers and pesticides.

The province has no major pollution related industries. Only small-scale and cottage industries such as food processing and handicrafts are existing. Hence, the waterbodies are not yet polluted/contaminated by industrial pollutants. As of now, the rivers of the province have not been classified as to their usage by the Department of Environment and Natural Resources (refer to general information in Table 3.6.1 DENR Water Quality Criteria/Water Usage and Classification, Supporting Report).

3.6.3 Solid Waste Disposal

Only Basco has a municipal refuse collection and disposal service. It has 2 units of open dump trucks. In the province, only 37% of the households is served, while majority (63%) is unserved. Table 3.6.1 reflects the breakdown of the manner of solid waste collection and disposal, and service coverage by municipality.

Open dumping is commonly practiced by the LGUs as a disposal of solid wastes. The dumped refuse is usually burned or left unattended. Some significant negative effects associated with this unsanitary method are surface and groundwater pollution, air pollution, scattered solid waste, breeding grounds for insects, rodents and other disease vectors and fire hazard. At the household level, unserved households by the LGUs primarily depend on individual disposal such as dumping in vacant lots or body of water, burying and composting.

Table 3.6.1 Municipal Solid Waste Collection and Disposal, and Service Coverage, 1995

Municipality	Numbers of Households 1995	With Service						Without Service				Percentage of Households Served	Percentage of Households Unserved
		No. of Collection Trucks			Disposal			Manner of Disposal (Number of Household)					
		Open Dump Trucks	Closed Type Trucks	Total Units	Number of Households Served by Open Dump Site	Number of Households Served by Sanitary Landfill	Total Households Served	Dumping (Land and Water)	Burying	Composting	Total Households Unserved		
Basco (Capital)	1,283	2	0	2	1,216	0	1,216	0	0	67	67	95	5
Itbayat	742	0	0	0	0	0	0	563	159	20	742	0	100
Ivana	262	0	0	0	0	0	0	200	38	24	262	0	100
Mahatao	390	0	0	0	0	0	0	329	38	23	390	0	100
Sabtang	373	0	0	0	0	0	0	330	23	20	373	0	100
Uyugan	252	0	0	0	0	0	0	249	3	0	252	0	100
Provincial Total	3,302	2	0	2	1,216	0	1,216	1,671	261	154	2,086	37	63

Chapter 4

EXISTING FACILITIES AND SERVICE COVERAGE

4. EXISTING FACILITIES AND SERVICE COVERAGE

4.1 Water Supply

4.1.1 General

Existing water supply facilities and conditions were surveyed by municipality under the category of urban and rural areas (as of July, 1995). Facilities are classified into three service levels, of which Level I facilities are further classified into safe and unsafe for drinking purpose.

The percentages of service coverage by different service level were estimated covering urban and rural areas by municipality. The served population is defined as "population served adequately with access to safe water sources/facilities." The rest of the population with unsafe sources/facilities and without access to water supply facilities was then defined as "underserved population" and "unserved population," respectively. The service coverage was figured out using estimated population in 1995.

Service profile and operating conditions of existing facilities are summarized by service level to come up with problem areas and the need of rehabilitation to reflect in the development plan.

As a provincial total, approximately 91% of the present population (of which 36% in urban area and 67% in rural area) is considered as adequately served (refer to detailed study in Supporting Report). Under the area classification, 92% of urban population and 90% of rural population have access to safe water sources/facilities, while the rest is underserved and/or unserved. Although majority of the population (14,894 persons or 96%) are served by Level III and/or Level II systems, an intermittent supply is prevalent mainly caused by the unbalance between supply capacity and demand. The rest, only 635 persons or 4% of the served population depend on Level I facilities.

4.1.2 Types of Facilities and Definition of Service Level Standard

(1) Composition of Water Supply System/Facility

The NSMP defines service level and system components of the water supply systems/facilities as shown in Table 4.1.1.

Table 4.1.1 Composition of Water Supply System/Facility by Service Level

Description	Level I (Point Source Facility)	Level II (Communal Faucet System)	Level III (Individual House Connection)
1. Water Source	Drilled/driven shallow well Drilled/driven deep well Dug well Spring Rain collector	Drilled shallow/deep well Spring Infiltration gallery	Drilled deep well Spring Infiltration gallery Surface water intake
2. Water Treatment	Generally none. Disinfection of wells is conducted periodically by local health authorities. Iron removal facilities are provided in problem areas.	Generally none. Disinfection facility is sometimes provided.	Disinfection is provided. Systems with a surface water source have a series of water treatment facilities.
3. Distribution	None	Piped system provided with reservoir/s.	Piped system provided with reservoir/s and pumping facilities.
4. Delivery & Service Level	At point (within 250 m radius)	Communal faucet (within 25 m radius)	Individual house connection/ household tap
5. Consumption Rate (adequately served)	at least 20 lpcd	at least 60 lpcd	at least 100 lpcd

(2) Safe and unsafe classification of water sources

DOH has classified Level I water source facilities as safe (reliable water source) and unsafe sources/facilities under the drinking water quality standard.

Safe source: Protected deep well, protected shallow well, improved/covered dug well and developed spring

Unsafe source: Unprotected deep well, unprotected shallow well, open dug well, undeveloped/unprotected spring and rain collector

Water sources other than the above, such as untreated surface water of rivers, lakes and ponds are among unsafe sources. Level II and III water supply systems are, on the other hand, regarded to have safe/reliable sources in a provision of adequate treatment.

(3) Service level standard

The NSMP defines "adequate service level" by different water supply system. Improvement in the number of households per system may be expected for Level I services in the future. On the contrary, the number of households served by a unit of private/public source is sometimes beyond the standard on a current basis.

Level III: 1 household/connection

Level II: 5 (4 to 6) households/communal faucet

Level I: 15 households/point source
1 household/private well

4.1.3 Level III Systems

Level III systems (individual house connection system) at municipal level are usually established and operated by WD under technical and financial assistance of LWUA. Some LGUs also implement and operate Level III systems commonly at barangay level.

In the province of Batanes, there are 6 Level III systems being operated under different kinds of ownership (authority or association) as shown in Table 4.1.2. These are:

- Municipal waterworks in Basco, Ivana, Mahatao, Sabtang and Uyugan, and
- Barangay waterworks for Chanarian in Basco municipality.

Five Level III systems except Sabtang M.W. entail Level II services through communal faucets. Service coverage in Table 4.1.2 shows combined figures of Level III and Level II services.

Table 4.1.2 Information on Existing Level III Systems

Municipality	Name of System (Operating Body)	Water Source and Consumption			Service Coverage						
		Type of Water Source[1]	Water Consumption (cu. m/day)	Domestic Supply (%)	Number of Barangays Served			HH Pop.	Number of HHs/ Pop. Served		
					Urban	Rural	Total		Urban	Rural	Total
Basco	Basco M.W.	SP	899	91.10	2	3	5	HHs	830	285	1,115
								Pop.	4,150	1,482	5,798
	Chanarian RWSA	SP	21	100.00	0	1	1	HHs	0	35	35
								Pop.	0	175	175
	Municipal Total		920	91.30	2	4	6	HHs	830	320	1,150
								Pop.	4,316	1,664	5,980
Ivana	Ivana M.W.	SP	128	98.44	0	4	4	HHs	0	249	249
								Pop.	0	1,215	1,215
Mahatao	Mahatao M.W.	SP	284	98.94	1	3	4	HHs	84	265	349
								Pop.	353	1,299	1,652
Sabtang	Sabtang M.W.	Dg-W/ SP	28	100.00	2	0	2	HHs	119	0	119
								Pop.	595	0	595
Uyugan	Uyugan M.W.	SP	132.5	99.62	0	4	4	HHs	0	246	246
								Pop.	0	1,205	1,205
Provincial Total			1,493	94.24	5	15	20	HHs	1,033	1,080	2,113
								Pop.	5,264	5,383	10,647

Note: 1. Type of Water Source; *DW* - Deep Well, *Surf.* - Surface Water (River), *SP* - Spring, *Dg. W* - Dug Well

The largest system in the province is the Basco M.W. covering 2 urban barangays and 3 rural barangays in provision of 2 spring sources. Sabtang M.W. is serving only for 2 urban barangays, while Chanarian RWSA, Ivana M.W. amd Uyugan M.W. are catering rural barangays. Mahatao M.W. is operated for 1 urban and 3 rural barangays.

All Level III systems utilize spring sources. Sabtang M.W. has 2 dug wells as major water sources supplemented by the spring source (details are referred to in Table 4.1.1, Supporting Report).

Although a higher service coverage (Level II and III) has been achieved, an intermittent supply is prevalent mainly caused by the imbalance between supply capacity and demand. Related problems were wastage due to leakages, friction loss due to small pipelines and unprotected pipelines that are exposed to possible damages during typhoons.

4.1.4 Level II Systems

Generally, Level II systems (communal faucet system) are designed to cater for barangay level water supply with a limited service coverage and supply capacity, and being implemented by different agencies (DPWH, LWUA, DILG, DENR, LGUs) encouraging the use of spring sources and are operated by LGUs, RWSAs or NGOs.

There are 2 individual Level II systems being operated by respective municipalities as enumerated below and shown in Table 4.1.3 (details are referred to in Table 4.1.2, Supporting Report).

- Municipal Waterworks for 4 rural barangays in Itbayat, and
- Municipal Waterworks for 4 rural barangays in Sabtang.

Table 4.1.3 Information on Existing Level II Systems

Municipality	Name of System (Operating Body)	Type and No. of Water Source[1]		Number of Barangays Served			Number of Households Served			Number of Population Served		
				Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Itbayat	Itbayat M.W.	SP	1	0	4	4	0	650	650	0	3,315	3,315
Sabtang	Sabtang M.W.	SP	1	0	4	4	0	75	75	0	375	375
Provincial Total			2	0	8	8	0	725	725	0	3,690	3,690

Note: 1. Type of Water Source; *DW* - Deep Well, *Surf.* - Surface Water (River), *SP* - Spring, *IG* - Infiltration Gallery.

These Level II systems use spring sources. All these systems are reported to be providing potable water, although no disinfection is provided. Itbayat M.W. supplies water to consumers through its 80 communal faucets throughout the day, while Sabtang M.W. is serving for 18 hours a day. Both systems are reported to have inadequate water pressure at 30 to 35% of communal faucets. The collection efficiencies of water bill are 100% in Itbayat M.W. and 90% in Sabtang M.W.

Problem areas identified on existing Level II systems and necessary countermeasures for the improvement are discussed both in managerial and technical aspects.

(1) Management practice

Insufficient management practices are observed on these Level II systems through questionnaire survey that although water bills seem to be effectively collected, expenditures and billings/revenues are not answered. To attain financial and managerial sustainability especially for future repair/replacement of facilities, reinforcement of the operating body shall be promoted with reference to the institutional development.

(2) Technical skill for O&M of facilities

Reported problems on inadequate supply pressure/discharge are usually associated with insufficient source capacity and hydraulic head, clogging of spring box and pipelines, friction loss by inadequate small diameter of pipelines, leakage and improper usage of supplied water. In some cases, scheduled supply to sub-divided service areas through valve control is effective for equal distribution of limited water available.

For sustainable O & M of existing facilities, an appropriate technical guidance and skills training shall be arranged by concerned agencies/LGUs.

4.1.5 Level I Facilities

Level I facilities (point source) are common in rural barangays, majority of which are public facility. Major facilities are different types of wells equipped with handpumps or developed spring with transmission line and one communal faucet. A rain collector is also used in some areas.

Level I facilities are classified in terms of safe and unsafe sources referring to the water quality examination results conducted by PHO as presented in Table 4.1.4 (details are referred to in Supporting Report).

Table 4.1.4 Information on Existing Level I Facilities

Municipality	Number of Safe Water Sources					Number of Unsafe Water Sources					Served by Safe Sources					
											Number of Households			Number of Population		
	Deep Wells	Shallow Wells	Covered/ Improved Dug Wells	Developed Springs	Total	Shallow Wells	Open Dug Wells	Rain Collectors	Un-developed Spring	Total	Urban	Rural	Total	Urban	Rural	Total
Basco (Capital)	4	1	0	1	6	1	0	0	0	1	30	21	51	158	108	266
Ibayat	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Ivana	2	3	0	0	5	4	0	0	0	4	0	7	7	0	33	33
Mahatao	2	0	0	0	2	1	0	0	0	1	0	20	20	0	99	99
Sabtang	0	4	0	0	4	7	0	2	0	9	23	22	45	114	115	229
Uyugan	3	0	0	0	3	0	0	0	0	0	0	2	2	0	8	8
Provincial Total	12	8	0	1	21	13	0	2	0	15	53	72	125	272	363	635

Of the operational Level I facilities (total of 36 facilities), more than 58% is shallow wells. According to the PHO water quality analysis results, about 70% of Level I facilities is determined to be unsafe as the provincial average of random samples (0 to 100% on a municipal level). All deep wells were regarded as safe water sources. In application of the unsafe percentage to shallow wells for each municipality, 21 Level I facilities are classified as safe sources, while 15 facilities are under unsafe sources.

Problem areas observed on Level I facilities and necessary countermeasures for the improvement are summarized in terms of potable condition and functioning.

(1) Unsafe water sources

Most of the cases declared as unsafe sources are driven shallow wells which are unprotected against seepage of surface water and usually located nearby potential pollution sources, such as septic tank and piggery. (The Code on Sanitation of DOH requires a minimum 25m distance between water source and pollution sources.)

These shallow wells shall be provided with concrete apron on the ground surface and proper drainage facility at the surrounding area. Relocation of wells or pollution sources may be another countermeasure. For new construction of shallow wells, proper site selection and appropriate construction method shall be applied together with periodic monitoring of water quality.

(2) Non-functioning/abandoned wells

There are a lot of non-functioning public wells in the province as shown in Table 4.1.5. Private wells are also included in the table, however number of non-functioning wells is not available.

Table 4.1.5 Operating Status of Existing Wells in the Province

Operating Status	Unit	Public Wells		Private Shallow Well	Total
		Deep Well	Shallow Well		
Functioning	No.	12	16	5	33
	Percent	26	35	-	34
Non-Functioning	No.	35	30	N/A	65
	Percent	74	65	-	66
Total Number		47	46	5	98

Note: Number of non-functioning wells includes abandoned wells, but details in number and reasons are not available.
Total figures exclude number of non-functioning private wells.

Among others, deep wells usually necessitate repair/replacement of mechanical parts and redevelopment of the well itself. Aside from the same problems as deep wells, shallow wells have principal disadvantages in use of shallow aquifer easily affected by surrounding environmental conditions and caused by a simple construction method (driving well point) making it difficult to rehabilitate.

To prolong the service life of public deep wells, periodic check-up entailing preventive maintenance and redevelopment of wells are to be performed. Meanwhile, a proper site selection and protection of well sources are requisites for shallow wells.

4.1.6 Water Supply Service Coverage

According to the definition of DOH in terms of safe and unsafe sources, service coverage was studied under "served", "underserved" and "unserved" categories.

The present population of the municipalities as of 1995, base year for planning purpose, was estimated using 1990 population census data and annual average growth rate between census period 1980 and 1990. Details are referred to section 8.3 1 Population Projection.

Water supply service coverage by service level is estimated for urban and rural areas covering all municipalities under the following conditions and assumptions:

- Service percentage/population by Level III and Level II systems was estimated based on the questionnaire survey results.
- Unserved population was estimated using the percentages of unserved households to the total number of households by urban and rural area based on the 1990 population census data; "Households by Main Source of Drinking Water and City/Municipality."
- The rest of the population was considered to be served by Level I facilities assuming that 50% of private facilities was shared by neighbors to supplement insufficiency of public facilities.

Average number of households sharing at each Level I public/private facility was calculated with a range of 1 to 15 households/facility under the above assumptions (details are referred to in Supporting Report).

Table 4.1.6 presents the profile of the service coverage in terms of served, underserved and unserved. As a provincial total, 91% of the population is adequately served (92% of urban population and 90% of rural population). The provincial service coverage at present is exhibited in Figures 4.1.1 and 4.1.2 (details are referred to Supporting Report).

4.2 Sanitation and Sewerage

4.2.1 General

The national strategy for sanitation and sewerage is demand-oriented. It aims to stimulate sustainable improvements in sanitation service coverage, public health, and environmental pollution abatement. To achieve this goal, the Government has made investment choices based on demand and the extent to which choices contribute to efficiency and cost-effectiveness.

This sub-sector focuses on household toilets, school toilets and public toilets (public markets and bus/jeepney terminals). The latest data from the PHO on household and public toilets as well as from DECS on school toilets were gathered by municipality. In case of household toilets, data were consolidated by urban and rural area. These facilities were classified into sanitary and unsanitary in terms of structure rather than the surrounding conditions.

The Code on Sanitation of the Philippines provides the minimum standards for services dealing with public health. Specifically, Chapter XVII on Sewage Collection and Disposal, Excreta Disposal and Drainage defines alternatives for on-site sanitation and sewage collection and disposal. At present, the development of sewerage systems, even in the urban centers of the province is not given priority because of the huge investment cost it entails.

4.2.2 Types of Facilities and Definition of Service Level Standard

For this Master Plan, the types of household toilet facilities commonly used are categorized into: 1) sanitary toilets - approved types of toilet facilities include water-sealed pour flush or flush-type toilets either with receiving space/pit or septic tanks/vaults, and ventilated improved pit latrines and sanitary privy considering its low construction cost especially in rural areas; and 2) unsanitary facilities - these include the types of facilities used for

Table 4.1.6 Water Supply Service Coverage by Municipality

Municipality	Type	Population (1995)	Population Coverage							Percentage of Population Coverage						
			Served by Safe Source				Underserved/Unserved			Served by Safe Source				Underserved/Unserved		
			Level III	Level II	Level I	Total	Unsafe Source	Unserved	Total	Level III	Level II	Level I	Total	Unsafe Source	Unserved	Total
Basco (Capital)	Urban	4,651	4,316	0	158	4,474	158	19	177	93	0	3	96	3	1	4
	Rural	1,985	1,664	187	108	1,959	0	26	26	84	9	5	98	0	2	2
	Total	6,636	5,980	187	266	3,433	158	45	203	90	3	4	97	2	1	3
Itbayat	Urban	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rural	3,787	0	3,315	0	3,315	0	472	472	0	88	0	88	0	12	12
	Total	3,787	0	3,315	0	3,315	0	472	472	0	88	0	88	0	12	12
Ivana	Urban	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rural	1,317	1,215	25	33	1,273	27	17	44	92	2	3	97	2	1	3
	Total	1,317	1,215	25	33	1,273	27	17	44	92	2	3	97	2	1	3
Mahatao	Urban	424	353	0	0	353	71	0	71	83	0	0	83	17	0	17
	Rural	1,498	1,299	50	99	1,448	50	0	50	87	3	7	97	3	0	3
	Total	1,922	1,652	50	99	1,801	121	0	121	86	3	5	94	6	0	6
Sabtang	Urban	953	595	0	114	709	154	90	244	62	0	12	74	16	10	26
	Rural	975	0	375	115	490	291	194	485	0	38	12	50	30	20	50
	Total	1,928	595	375	229	1,199	445	284	729	31	19	12	62	23	15	38
Uyugan	Urban	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rural	1,238	1,205	25	8	1,238	0	0	0	97	2	1	100	0	0	0
	Total	1,238	1,205	25	8	1,238	0	0	0	97	2	1	100	0	0	0
Provincial Total	Urban	6,028	5,264	0	272	5,536	383	109	492	87	0	5	92	6	2	8
	Rural	10,800	5,383	3,977	363	9,723	368	709	1,077	50	37	3	90	3	7	10
	Total	16,828	10,647	3,977	635	15,259	751	818	1,569	63	24	4	91	4	5	9

Note: Level II services in 4 municipalities: Basco, Ivana, Mahatao and Uyugan are extended part of municipal water supply (Level III).

Figure 4.1.1 Water Supply Coverage by Municipality
Unserved
Unsafe
Level I
Level II
Level III
Provincial Average of Served Percentage
Boundary between Served and Underserved
Percentage of Population Coverage
100
90
80
70
60
50
40
30
20
10
0
Municipalities
Province
Basco (Capital)
Itbayat
Ivana
Mahatao
Sabtang
Uyugan
BATANES

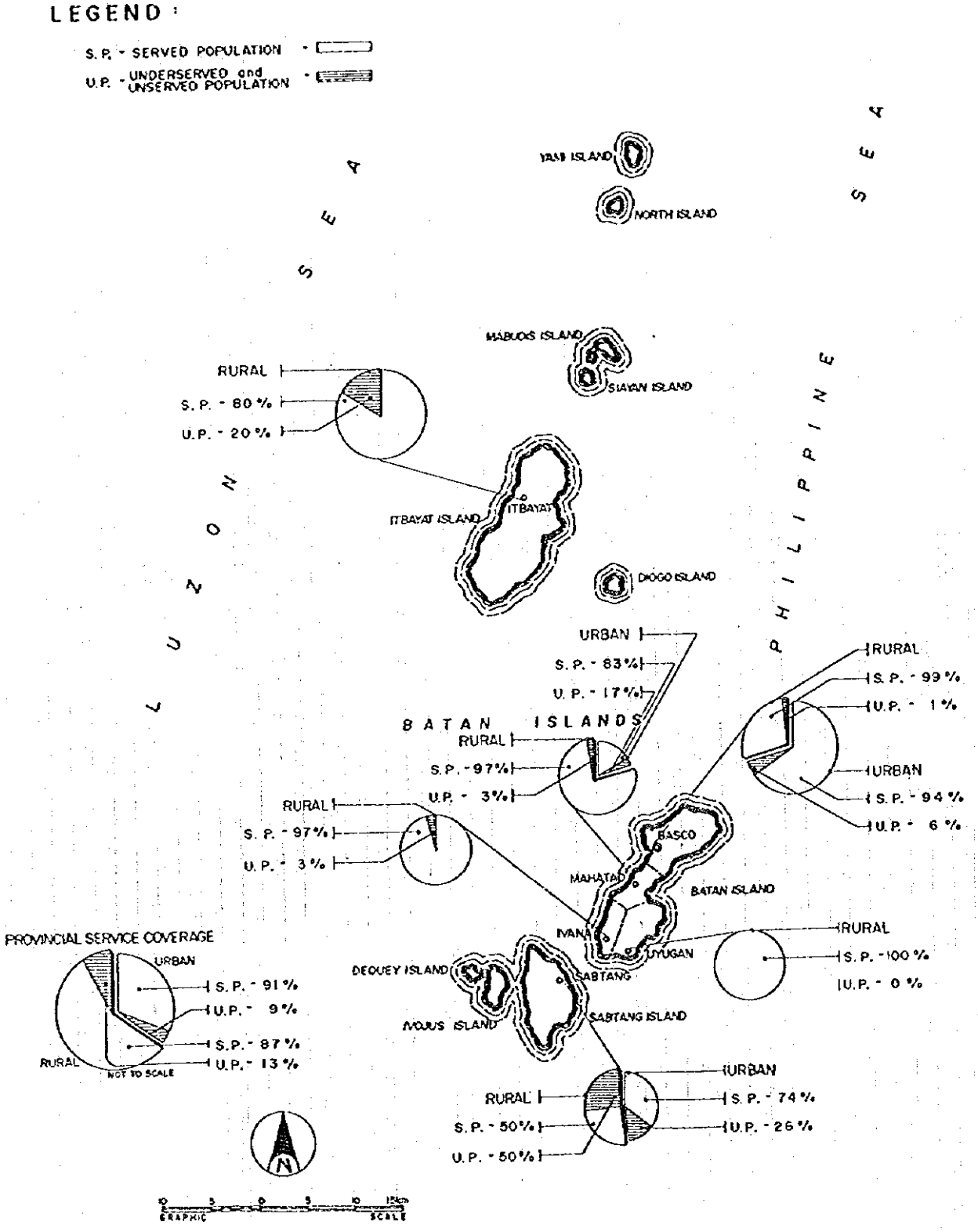


FIGURE 4.1.2
EXISTING WATER SUPPLY SERVICE COVERAGE MAP

receiving and disposing human waste which do not fall under the category of approved types of toilet facilities such as open pit privy and over-hung latrines (refer to Figure 4.2.1 DOH standard structure of a household toilet that meets the minimum requirements of a sanitary facility, Supporting Report).

In terms of service level, households are classified into: 1) served households - households with at least one (1) sanitary toilet; 2) underserved households - households with unsanitary toilets; and 3) unserved households - households without toilet. Coverage of adequately served households (with sanitary toilets) was estimated by urban and rural area of municipalities. The remaining households were considered as underserved and/or unserved. The service coverage was determined using the estimated number of households in 1995.

Service level standard for both elementary and secondary school toilets is translated in terms of: 1) served students - students who are adequately covered by the DECS standard ratio of one (1) unit per 50 students with access to sanitary toilets (number of sanitary toilet units multiplied by 50); and (2) underserved and/or unserved students - those with unsanitary and without toilet facilities, and students unserved (based on the standard ratio) even though they have access to sanitary toilets. Service coverage of adequately served students was estimated both for public and private schools by municipality. Figure 4.2.2, Supporting Report shows a standard structure of a school toilet facility adopted by the DOH through the JICA-DPWH and DOH Rural Environmental Sanitation Project.

For public toilets, the service level is classified into: 1) served - utilities that have at least one (1) sanitary toilet, and 2) underserved and/or unserved - utilities that have unsanitary or without toilet facilities. Service coverage of public utilities was estimated as a percentage of sanitary facilities to the total number of utilities.

4.2.3 Sanitation Facilities and Service Coverage

(1) Household Toilets

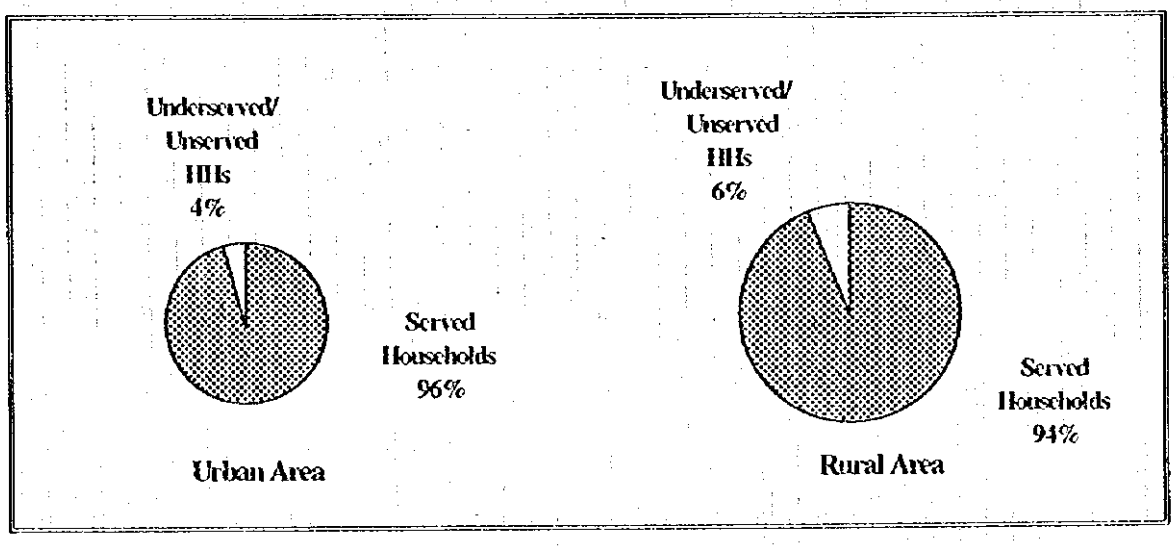
The service coverage of sanitary toilets in the province is 95% of the total number of households. The rest is underserved and/or unserved. Of this, about 27% is without toilet facilities (refer to Table 4.2.1, Supporting Report and 4.2.3 Sanitation Facilities and Service Coverage, Data Report).

In urban areas, approximately 96% of the total households is served, while 94 % in rural area. Table 4.2.1 shows the municipal breakdown in the number of urban and rural household toilets by category, and service coverage. Figures 4.2.1 and 4.2.2 reflect the provincial service coverage of household toilet facilities for urban and rural areas.

Table 4.2.1 Sanitation Facilities and Service Coverage of Household Toilets, Urban and Rural, 1995

Municipality	Households 1995			Household Toilet Facilities and Service Coverage											
				Urban				Rural				Municipal Total			
	Urban	Rural	Total	Households Served by Sanitary Toilets		Underserved / Unserved HHs		Households Served by Sanitary Toilets		Underserved / Unserved HHs		Households Served by Sanitary Toilets		Underserved / Unserved HHs	
				Number	% of HH	Number	% of HH	Number	% of HH	Number	% of HH	Number	% of HH	Number	% of HH
Basco (Capital)	891	392	1,283	874	98	17	2	379	97	13	3	1,253	98	30	2
Itbayat	0	742	742	0	0	0	0	669	90	73	10	669	90	73	10
Ivana	0	262	262	0	0	0	0	255	97	7	3	255	97	7	3
Mahatao	82	308	390	81	99	1	1	294	95	14	5	375	96	15	4
Sabtang	188	185	373	162	86	26	14	162	88	23	12	324	87	49	13
Uyugan	0	252	252	0	0	0	0	250	99	2	1	250	99	2	1
Provincial Total	1,161	2,141	3,302	1,117	96	44	4	2,009	94	132	6	3,126	95	176	5

Figure 4.2.1 Provincial Service Coverage of Household Toilet Facilities, 1995



(2) School and Public Toilets

Toilet facilities in elementary and secondary schools for both public and private schools were investigated. The province has a total of 88 toilet units found in 24 schools. About 86% of the students is adequately served by sanitary toilets. The rest, 14% is underserved and/or unserved.

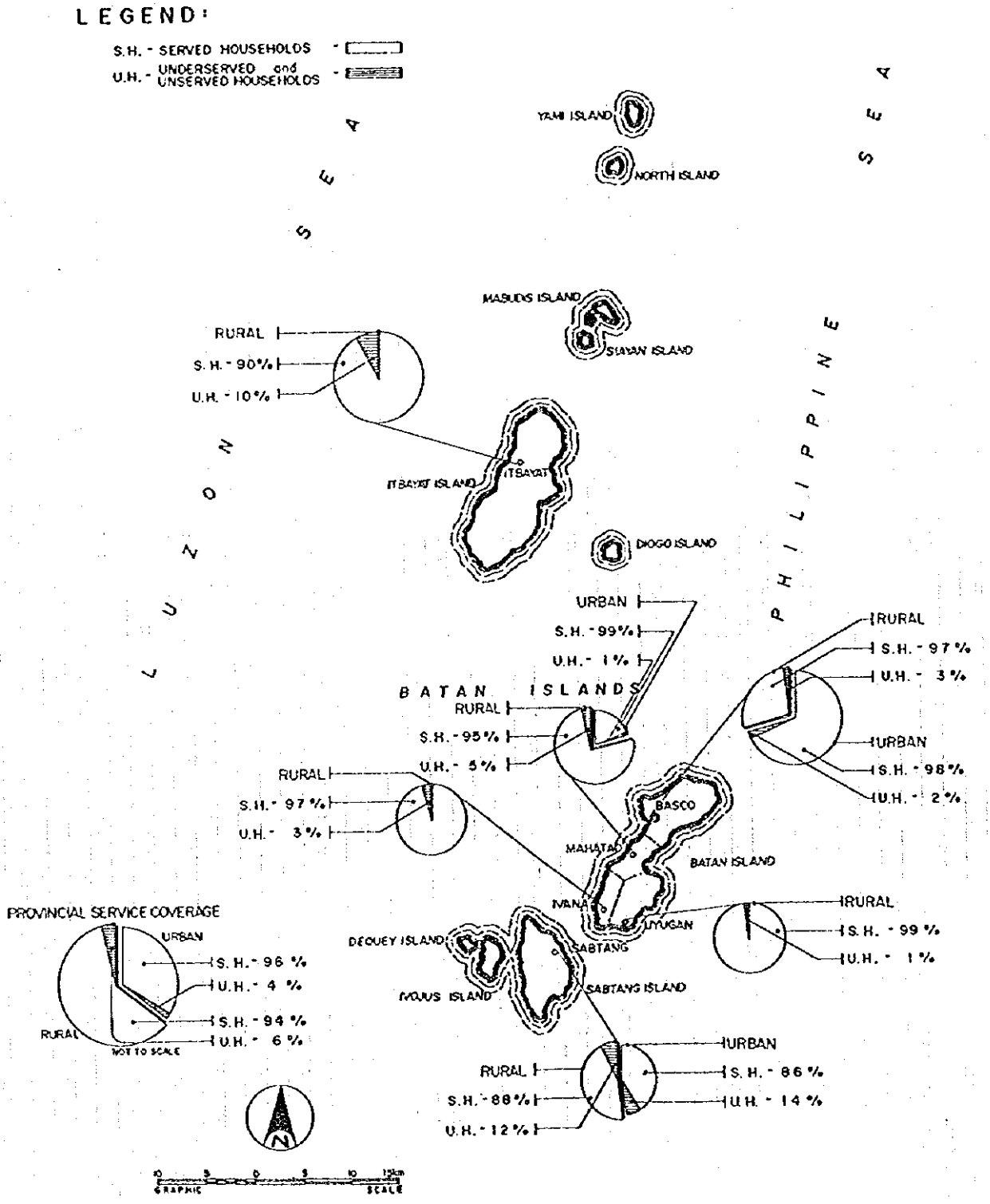


FIGURE 4.2.2
EXISTING HOUSEHOLD TOILETS SERVICE COVERAGE MAP

There are 6 public markets, bus/jeepney/airport terminals and parks/playgrounds in the province. About 67% of these public utilities is served, while the remaining 33% is underserved and/or unserved. Table 4.2.2 and Table 4.2.3 provide the number and service coverage of toilet facilities of schools and public utilities, respectively.

(3) Problem Areas

Compared to the national service coverage of sanitary household toilets of 77%, the province showed a higher sanitation level. Likewise, school and public toilets manifested high service coverage.

Even if a high service percentage of sanitary toilets is revealed, problems arise from the unsatisfactory disposal of the effluent from the septic tanks, or the direct discharge of wastewater to the local drains. Generally, there is little concern about the unsatisfactory disposal of wastes once it is outside their dwelling units. Practically, almost all the households dispose their wastes in the manner that poses risks to public health.

A common problem of school and public toilets is the lack of water supply on-site for flushing, cleaning and other hygiene-related activities. Further, public toilets at markets and bus/jeepney terminals, although culturally acceptable, are improperly used and maintained resulting in unsanitary conditions. In most cases, no specific arrangements are made for the operation and maintenance and for the collection of fees to cover such costs.

4.2.4 Sewerage Facilities

There are no existing sewerage facilities in the province. Most of the wastewater from the dwelling units with acceptable facilities finds its way to open drains and watercourses. These deficiencies are the major contributing factors to the poor condition of the water environment in some areas of the province.

Table 4.2.2 School Toilet Facilities and Service Coverage in 1995

Municipality	Number of Schools			Number of Students			Number of Toilet Units							Service Coverage											
							Sanitary			Unsanitary			Total Units	Served						Underserved/Unserved					
														Public		Private		Total		Public		Private		Total	
	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total		Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Basco (Capital)	5	0	5	1,685	0	1,685	39	0	39	0	0	0	39	1,685	100	0	0	1,685	100	0	0	0	0	0	0
Itbayat	4	0	4	1,009	0	1,009	9	0	9	0	0	0	9	450	45	0	0	450	45	559	55	0	0	559	55
Ivana	3	0	3	302	0	302	10	0	10	0	0	0	10	302	100	0	0	302	100	0	0	0	0	0	0
Mahatao	2	0	2	405	0	405	9	0	9	0	0	0	9	405	100	0	0	405	100	0	0	0	0	0	0
Sabtang	6	0	6	349	0	349	8	0	8	0	0	0	8	349	100	0	0	349	100	0	0	0	0	0	0
Uyugan	4	0	4	295	0	295	13	0	13	0	0	0	13	295	100	0	0	295	100	0	0	0	0	0	0
Provincial Total	24	0	24	4,045	0	4,045	88	0	88	0	0	0	88	3,486	86	0	0	3,486	86	559	14	0	0	559	14

Table 4.2.3 Public Toilet Facilities and Service Coverage in 1995

Municipality	Public Markets				Jeepney/Bus/Airport Terminals				Parks/Playgrounds				Total No. of Public Utilities	Served		Underserved/Unserved	
	Number	Number of Toilets			Number	Number of Toilets			Number	Number of Toilets				No. of Sanitary Toilets	%	No. of Unsanitary Toilets	%
		Sanitary	Unsanitary	No Facility		Sanitary	Unsanitary	No Facility		Sanitary	Unsanitary	No Facility					
Basco (Capital)	1	1	0	0	1	1	0	0	0	0	0	0	2	2	100	0	0
Itbayat	0	0	0	0	1	1	0	0	0	0	0	0	1	1	100	0	0
Ivana	0	0	0	0	1	1	0	0	1	0	0	1	2	1	50	1	50
Mahatao	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1	100
Sabtang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uyugan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Provincial Total	1	1	0	0	3	3	0	0	2	0	0	2	6	4	67	2	33

Chapter 5

EXISTING SECTOR ARRANGEMENTS AND INSTITUTIONAL CAPACITY

5. EXISTING SECTOR ARRANGEMENTS AND INSTITUTIONAL CAPACITY

5.1 General

Much has happened in the sector since 1987 when the national master plan was initially prepared. The water supply, sewerage and sanitation sector today is in a transition stage. The Local Government Code (LGC) has essentially re-defined the role, relationship and linkages of central, provincial, municipal and barangay institutions in the provision of basic services, including water and sanitation. The responsibility for water supply and sanitation functions were lodged with various national agencies. The new direction mandates the LGUs to play a larger role in planning and implementing water supply and sanitation projects. This raises serious institutional capacity and resource reallocation issues.

Chapter Five provides an overview of existing sector policies and arrangements as a basis for formulating modifications and improvements. It identifies current capacity building issues which need to be addressed in the early stages of master plan implementation. Most importantly, it assesses the impact of the present centralized delivery system at the local levels.

5.2 Sector Reforms

The GOP has set the future agenda for sector reform. These initiatives followed the completion of the Water Supply Sector Reform Study and the National Urban Sewerage and Sanitation Strategy Study. The GOP has endorsed the major recommendations of these studies through the following NEDA resolutions:

(1) NEDA Resolution No. 4 (series of 1994): LGUs, in the context of the LGC and related decentralization efforts, now play a lead role in service delivery. The resolution allows LGUs to implement all levels of water supply projects and redefines the roles of other sector agencies. LWUA shall implement only financially viable Level III water supply projects in areas outside the MWSS jurisdiction. DILG's participation will consist of general administration and institution building, such as assistance to the LGUs in the formation of Rural and/or Barangay Waterworks and Sanitation Association and in the identification of water supply systems. *DPWH, together with DILG and DOH, will provide technical assistance (within a period of about 2 years) to LGUs in the planning, implementation and operation and maintenance of water supply facilities.*

(2) NEDA Resolution No. 5 reaffirms the principle of provision of sewerage and sanitation services on the basis of willingness-to-pay. The resolution mandates the establishment of a Central Project Support Office (CPSO) at LWUA to assist LGUs in the formulation, preparation and implementation of sewerage and sanitation projects.

5.3 Sector Institutions

(1) Existing Institutional Arrangements

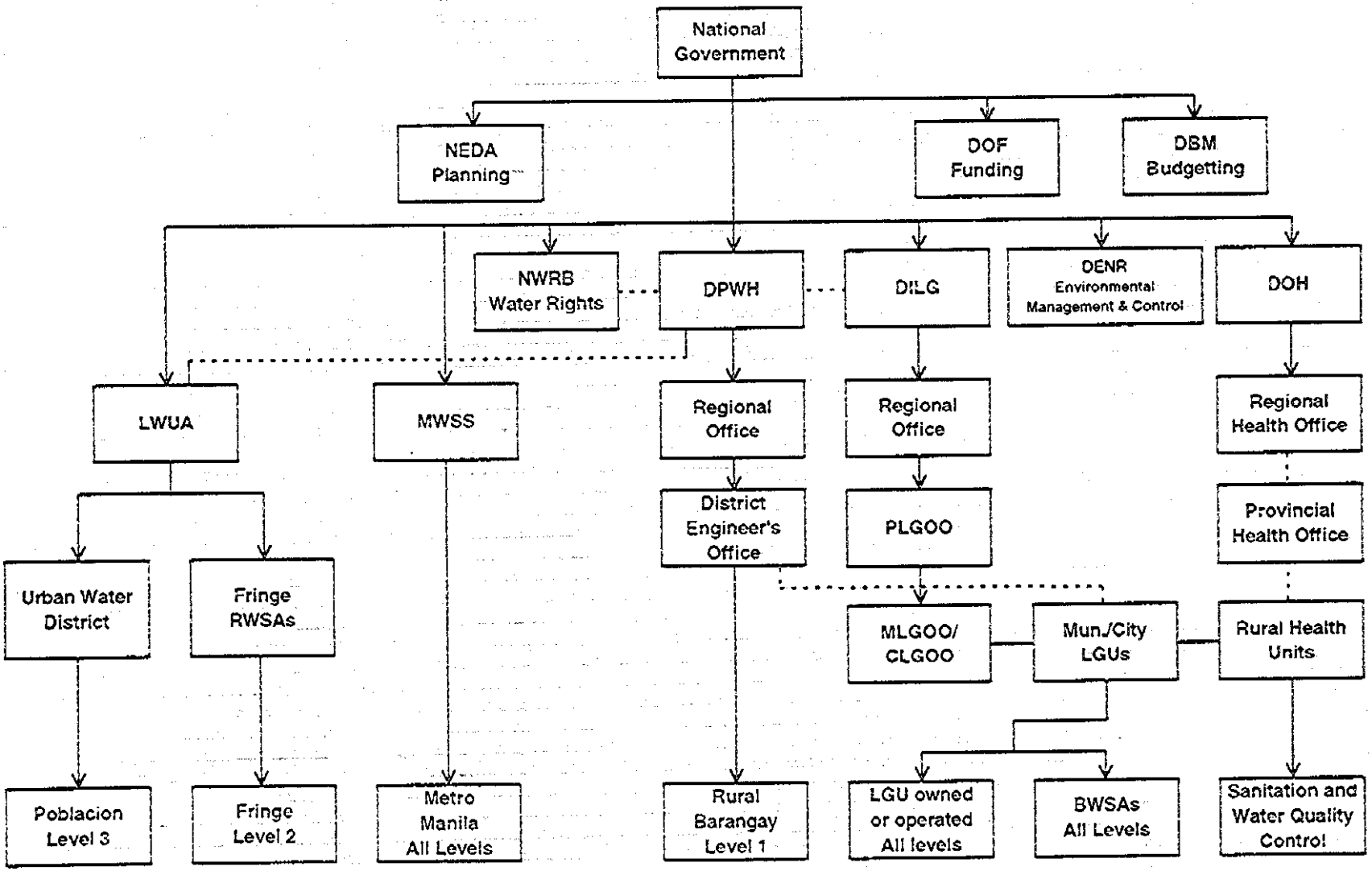
In the beginning of this chapter, it was noted that the sector is in transition. The LGC, however, mandates major changes on sector structure and performance in the future. New Implementing Rules and Regulations (IRR) reflecting the new sector role of the LGUs and national agencies are being prepared. Sector projects are still led generally by national agencies, in coordination with LGUs. The following discussion on institutional arrangements therefore presents the starting point of the transition (i.e., the existing set-up).

At the central level, there are three (3) line departments (DILG, DPWH and DOH) and two (2) government owned and controlled corporations (LWUA and MWSS) responsible for planning and implementation (refer to Figure 5.3.1, Functional Relationship). Other GOP departments are concerned with macro-planning, national resource allocation decisions, as well as exercise of regulatory powers for tariff setting, and environmental protection and management issues.

At the provincial and municipal levels, there are central agency field offices (of DPWH and DILG) and LGU offices working in the sector. DOH field offices have since been devolved and most of its resources are already under LGU supervision. Water districts, RWSAs and BWSAs have been organized to deal with the actual delivery of services. Some LGUs continue to operate municipal or provincial water and sanitation systems. As the LGC is gradually put into operation, many of the responsibilities and resources currently administered by central departments may be devolved to LGUs. Project management offices (PMOs, at the central level), *ad hoc* inter-agency committees and task forces have been organized to address coordination issues.

There are many water and sanitation activities outside the government realm. The private sector, NGOs and community-based organizations (CBOs), out of necessity, are rehabilitating publicly-installed, non-operating facilities or constructing new ones.

Figure 5.3.1 - Functional Relationships



The current major institutional issues are those of management of the transition process and of re-establishing leadership in the sector. Major resource realignments and capacity building initiatives are needed. The formulation of a new set of implementing rules and regulations will be started shortly.

(2) Sector finance

The water sector reform study reports that in order to increase nationwide water supply coverage to about 87% by 1998, new investments of about ₱39.3 B will be needed. Of this, only ₱12.8 B has been secured, i.e., carried over from existing projects. In addition, the level of public investment in water supply has declined in real terms in recent years. During the period 1988 through 1992, ₱17.268 B was allocated of which only ₱10.453 B was disbursed. Despite the declining trend in investments, the water sector fund utilization rate is only 60.5% - indicating serious institutional planning and implementation capacity issues. The delay in the institutional response to the policy shifts has invariably contributed to this decline in activity level.

If the new arrangements are to flourish, the issue of LGU access to external sources of capital development funds (backed by GOP guarantees) needs to be addressed.

5.4 Sector Agencies at the National Level

(1) Department of the Interior and Local Government (DILG)

Responsibility: The Department has the mandate of strengthening local capacity for delivery of basic services, including water and sanitation. It is responsible for providing general administration and institution-building support to LGUs including assistance in the formation and training of BWSAs; coordination of master plan preparation; sourcing of external funds; formulation and installation of sector management systems, including O&M and BWSA financial management systems. Ultimately, DILG is geared to provide a range of support activities to develop the capability of LGUs to provide, manage, operate and maintain water supply projects either directly or through community-based organizations, like BWSAs.

Current Activities: On a transitory basis, interagency provincial and municipal water task forces have been established in some provinces. These task forces (TFs) are the

current sector entry point of DILG. Through the TFs, barangays needing improved water supply and households needing sanitation improvements are identified and organizations are formed. Training activities are also done with the TFs. Conferences are held regularly to assess performance and review sector experiences. Training generally follows the cascade approach from the national up to the barangay level.

Resources: The PMO for Water Supply and Sanitation is established under the Assistant Secretary for Plans and Programs. About sixty (60) staff members comprise the PMO. It has four (4) operating divisions (Administration; Finance and Procurement; Project Planning; and Field Operations). Its Work Program is integrated with the DILG Annual Plan of Implementation. Like other line Departments, DILG's annual budget allocation goes through the general appropriations review and approval process in Congress which usually requires a one-year lead time. Action officers are assigned for every active province. Monitoring and evaluation of project implementation are done by the provincial (and municipal) local government operations officers (PLGOOs/ MLGOOs). Funds for sector training and BWSA formation are channeled through the regional and provincial DILG offices.

(2) Local Water Utilities Administration (LWUA)

Responsibility: LWUA is a specialized lending institution mandated to promote and oversee the development of provincial water utilities based on financial viability of projects. Most water utilities were under the LGUs until 1973, when some LGUs opted to waive their control over the utility and organize water districts (WDs) to qualify under the LWUA program. In 1987, LWUA responsibilities were expanded to include assistance to Level II Rural Waterworks and Sanitation Associations (RWSAs). The provision of Level II and III service and of wastewater disposal systems in communities outside Metropolitan Manila are largely coordinated through the LWUA. The WDs currently serve about 18.43 M consumers in about 703 cities and municipalities. NEDA Resolution No. 4 directs LWUA to focus on its development banking role and to finance only viable WDs. Since its establishment in 1972, LWUA has formed 544 WDs (486 of which have availed of loans totaling P 4.0 B). It has completed over 880 water supply projects.

Activities: LWUA has since developed a wide array of support services for WD development.

Institutional development services for WDs and RWSAs include: formation, management advisory services, training programs, management audits and operations reviews, installation of uniform commercial practices systems; information and marketing support.

Financial services include: economic and financial analysis, tariff analysis and fund sourcing. Various types of loans are available to finance the construction of water systems; reactivation of non-operating systems, rehabilitation and expansion of facilities; and training. Special loans finance watershed management projects; construction of administration buildings; purchase of service vehicles, communication and computer facilities; restoration of facilities damaged by calamities; initial or emergency operational needs. Commodity loans support generation of additional service connections.

Technical services: LWUA oversees the planning, design, construction, and control of quality standards to improve the water system facilities of WDs and RWSAs. LWUA formulates uniform standards for design, materials and construction to lower project costs and disseminates periodic water supply industry performance indicators.

LWUA consults with interested LGUs on the formation of WDs and RWSAs. Public hearings are held prior to the formation of WDs and tariff adjustments. Where tariff increases are not accepted, improvement projects are either reviewed or shelved altogether. LWUA collaborates with LGUs and consumers on all phases of WD improvement programs especially during the construction of water supply facilities.

Resources: LWUA maintains and fields a pool of management advisors, trainers, engineers and other professionals to give WDs and RWSAs proper guidance in their operation and administration. In addition, the Central Sewerage and Sanitation Program Support Office (CPSO) was recently established at LWUA to coordinate the implementation of sewerage and sanitation projects at the national level and to assist LGUs and WDs plan and manage sewerage and sanitation projects and programs at the local level.

LWUA training programs embrace efforts directed at the training and education needs of those who manage and operate water supply systems and those who provide assistance from the national level so that the water systems will succeed. Training for the water districts comprise about 20 technical and 20 management courses while in-house courses

such as cadetship training for fresh engineering graduates, management advisors, and supervisors courses on construction project management, and computer education.

(3) Department of Public Works and Highways (DPWH)

Responsibility: The Department is responsible for the construction and major repair/rehabilitation of rural water supply systems (Level 1) and for the planning and execution of sewerage projects in some cities and larger poblaciones in the country with participation of LGUs.

Activities: The actual construction of the projects are done, through contract or force account by the regional and district offices of the Department or other designated agencies under supervision of the PMO and in accordance with approved work programs. The following describes the current project planning and programming process for water supply projects. The central office advises regional office that funding will be available and requests for proposals for a specified number of projects. The regional office allocates the total number of projects among the district offices and directs preparation of a Program of Work (PoW) with a listing of sites. A draft PoW is submitted to the PPDO for comments. In most instances, this is reviewed by the Provincial Board. PPDO endorses the PoW to the DPWH Regional Office. The PoW is sent to the PMO-RWS at the central office which authorizes the release of budget allotment. DEO is now cleared to start construction. Reporting is done based on accomplishments.

Resources: The PMO for Rural Water Supply was established in 1981 (Ministry Order 14) to "manage and direct the planning, design, construction, organization and maintenance of foreign-assisted rural water supply projects" of the Department. It consists of a 44 technical and 26 administrative staff (regular). In addition, as the loan project packages may require, project staff are recruited on contract. At the field level, the Department maintains about 92 District Engineering offices. Most of the DEOs are staffed with a water engineer, drilling crews and equipment. In some DEOs, staff have been assigned to oversee BWSA formation and training activities.

(4) Department of Health (DOH)

Responsibility: The Department is the principal health policy-making and implementing agency. Its main function is to develop and implement sanitation programs nationwide and administer health education aimed at reducing morbidity due to, among others,

waterborne and sanitation related illnesses specifically diarrhea diseases which ranked second leading cause of morbidity among the population in the past years. Its role in the water supply program is in the promotion of safe water supplies through water quality surveillance.

Activities: A major program of DOH (Environmental Health Service) is the improvement of the environmental sanitation conditions to make it more conducive to promotion and maintenance of the health of the people. The priority program components include water supply and sanitation (water treatment and disinfection, quality monitoring and surveillance), excreta and sewage disposal, wastewater collection and disposal. DOH also implements *Water for Life* project which calls for spring development for use in Level I systems and for organizing BWSAs. DOH is also responsible for the provision of sanitation facilities in rural areas.

Operating budgets come from general appropriations in the national budget. Capital expenditure funds to support construction of excreta and waste disposal systems come from project funds. Under the First Water Supply, Sewerage and Sanitation Sector Project, DOH administered a project subsidy of P105.00 (cost of the bowl) per toilet. Similar arrangements are ongoing with the IBRD-assisted FW4SP. In addition, it supervises the construction of public school toilets and sullage removal units and the distribution of household toilet bowls.

Resources: The health care system is delivered through five organizational levels: Central headquarters; Regional Health Offices and general and special hospitals; Integrated Provincial Health Offices, including provincial and district hospitals; Municipal Health Offices; and, Rural Health Units/Barangay Health Stations. Its unique structure enables the Department to reach up to the barangay level through its grassroots network of barangay health workers and volunteers. DOH manages regional and provincial laboratories with technicians who carry out water quality tests. It should be noted that a substantial segment of its institutional structure (from the provincial level downwards) has been devolved and is now supervised by the respective LGU.

Through its far-reaching network, DOH conducts health education campaigns which focus on women and children health in rural communities. The program is supported by centrally-produced information, education and communication materials. Enrichment of hygiene education lesson plans for the school curricula is undertaken by DECS and

DOH. Together with UNICEF, CIDA and other bilateral agencies, DOH has produced and distributed IEC materials with key messages on water supply, sanitation and hygiene behavior.

DOH provides training focused on skills development of its health workers, volunteers and community artisans. Its training programs are either conducted by in-house staff or commissioned through non-government organizations (NGOs). Provincial and district sanitary engineers and inspectors are trained on skills development and planning. Chemists and laboratory technicians are trained on tools and techniques to support on-going drinking water quality programs. BWSAs are instructed, among others, on protection and disinfection of water supply sources, constructing and maintaining toilets.

(5) Other National Agencies

Other national agencies provide macro-planning, funding and support, and regulatory guidelines for the water supply and sanitation sector.

The National Economic and Development Authority (NEDA), as the central planning office, ensures that all agency plans and programs are consistent with national priorities in the Medium-Term Public Investment Program and the Priority Sub-Sector Activity Layout. External grants and loan proposals are reviewed and approved at NEDA. It also coordinates the establishment of a system for national sector master planning and the monitoring system (with DILG).

The Department of Finance (DOF) is responsible for the generation and management of the financial resources of the government. It reviews and approves all public sector debt; oversees the fiscal soundness of public investments based on equity, cost recovery and economic growth, and sets the fiscal deficit of major government corporations, as part of the public sector borrowing program.

The Department of Budget and Management (DBM) plans the budget allocations for the government agencies, including capital and operating expenditures, equity infusion to public corporations, grants and subsidies for Congressional approval. DBM also ensures that budget releases conform with approved plans and programs.

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 province is responsible for the sector functions including: delivery of health services and infrastructure facilities intended to service the needs of the province, such as inter-municipal waterworks, drainage and sewerage, among others. The Province of Batanes has six (6) service priorities. These are:

a) Infrastructure including public works, school buildings and communication/ transportation facilities

b) Agriculture including agricultural research and agricultural extension

c) Health including hospital services, field and tertiary health services

e) Livelihood programs

f) Environmental and natural resources including community-based forestry program and environmental law enforcement

g) Social welfare and development including population development

1) The Provincial Planning and Development Office (PPDO) is primarily tasked to:

(a) Formulate integrated economic, social, physical and other development plans and policies;

(b) Conduct continuing studies, researches and training programs necessary to evolve plans and programs for implementation;

(c) Integrate and coordinate all sector plans and studies undertaken by the different functional groups and agencies; and

(d) Prepare comprehensive plans and other development planning documents.

Under the existing organizational set-up, the PPDO is composed of 15 personnel deployed in six (6) units (divisions) (refer to Figure 5.5.1, Supporting Report). Distribution of employees per division is as follows:

(a) Office of the Planning Coordinator	-	2
(b) Plans and Programs	-	4
(c) Research, Evaluation and Statistics	-	4
(d) Economic Enterprise Dev't. & Mgnt.	-	0
(e) Environment & Natural Resources	-	3
(f) Administrative	-	2
Total		15

Under the 20% development fund of the province, a certain amount is allotted to the sector based on the following scheme of selecting projects:

(a) The submission of the list of projects by barangay or municipal governments.

(b) The prioritization is done through the application of weight factors, like the number of beneficiaries, financial feasibility, acceptance, among others.

2) The Provincial Engineer's Office (PEO) is mandated to do the following:

(a) Initiate, review and recommend changes in policies and objectives, plans and

programs, techniques, procedures and practices in infrastructure development and public works in the province;

(b) Advice the governor on infrastructure, public works and other engineering matters;

(c) Administer, coordinate, supervise, and control the construction, maintenance, improvement, and repair of roads, bridges, buildings, water supply, sanitation, sewerage, etc. of the province;

(d) Provide engineering services including investigation and survey, engineering designs, feasibility studies, and project management.

The office has 5 divisions/sections consisting of 32 regular/permanent personnel (refer to Figure 5.5.2, Supporting Report). Distribution of personnel by division is as follows:

(a) Office of the Prov'l. Engineer	-	2
(b) Planning and Programming	-	4
(c) Construction	-	1
(d) Construction and Maintenance	-	12
(e) Motor Pool	-	9
(f) Administrative	-	4
Total		32

Regarding various water supply and sanitation projects which were implemented by PEO during the last five (5) years, the provincial government has spent for: a) Level I, P2.753 million; Level II, P1.266 million and Level III, P4.10 million. For sanitation projects, PEO has installed public school toilets amounting to P.95 million.

3) The Provincial Health Office (PHO) is in the front-line of the delivery of health services, particularly during and in the aftermath of man-made and natural disasters and calamities. It is mandated to undertake the following:

(a) Formulate plans, programs, policies and projects on the promotion of health and sanitation for consideration of the Sangguniang Panlalawigan (SP);

(b) Upon approval of the SP, implement plans and programs in coordination with other government agencies, NGOs and the private sector;

(c) Execute and enforce all laws, ordinances and regulations relating to public health

(d) Exercise general supervision over health officers of component cities and municipalities as well as over the provincial and district hospitals.

Under its existing organizational structure, the Provincial Health Office employs 76 personnel assigned in the Office of the Provincial Health Officer, Itbayat District Hospital and in five (5) services --Medical, Paramedical, Dietary, Nursing and Administrative (refer Figure 5.5.3, Supporting Report).

(2) Municipal and Barangay Levels

The municipality is responsible for the coordination and delivery of basic, regular and direct services and for effective governance of its inhabitants. The barangay manages the services and facilities related to primary programs and project planning. Both the barangay and municipality are still adjusting to the devolution of government functions. They rely on the provincial and central government for the funding and implementation of sector projects.

1) Municipal Planning and Development Office (MPDO)

Mandate: The MPDO is mandated to formulate an integrated economic, social, physical and other development plans and policies for consideration of the municipal development council.

Activities: The regular activities of MPDO includes:

(a) Inter-office coordination and assistance on plans and programs preparation and project monitoring.
(b) Conduct continuing studies, researches, and training programs necessary to evolve plans and programs for implementation;
(c) Integrate and coordinate all sector plans and studies undertaken by the different functional groups and agencies;
(d) Prepare comprehensive plans and other planning documents; and
(e) Promote people participation in development planning.

Resources: The Municipal Planning and Development Office typically consists of the following personnel: one Municipal Planning and Development Coordinator, a Statistician, Economic Researcher and Clerk/Typist.

2) Municipal Engineer's Office (MEO)

Mandate: The MEO is responsible for the administration, coordination, supervision and control of the construction, maintenance, improvement and repair of public infrastructure facilities belonging to the municipality.

Activities: The MEO regularly performs the following:

(a) Initiate, review, and recommend changes in policies and objectives, plans and programs, techniques, procedures and practices in infrastructure development and public works;

(b) Administer, coordinate, supervise, and control the construction, maintenance, improvement, and repair of roads, bridges, water supply, sewerage, sanitation, and other structures of the municipality; and

(c) Provide engineering services like investigation and survey, engineering designs, feasibility studies, and project management.

Resources: In the province of Batanes, an MEO is typically composed of the following personnel: a Municipal Engineer, a Foreman, one Draftsman, and one Equipment Operator.

3) Barangay Councils (BCs)

The Barangay Council is the most basic governmental unit in the Philippine Political Structure. The Barangay is headed by the Chairman or Captain who shall act as the Chief Executive Officer. On the other hand, the legislative branch is called the Sangguniang Barangay with the Barangay Captain as Chairman and Presiding Officer.

It is expected that the barangay council promotes people's participation in local development efforts and in monitoring of national and local programs and projects.

4) Rural Health Units/Barangay Health Stations (RHU/BHS)

Rural Health Units are under the supervision of the Municipal Health Officer. On the other hand, the extension of the Rural Health Unit in the barangay is under the Barangay Health Station In Batanes. There are six (6) rural health units and another six (6) BHS where a variety of medical services like medical and dental services are administered.

(3) Field Offices of Central Sector Agencies

1) DPWH District Engineering Office

Mandate: The DEO is in charge of constructing and maintaining public infrastructure facilities such as the national roads, airports, public buildings, water supply systems, sea ports, flood control and drainage, school buildings and others. It ensures the

safety of all infrastructure facilities within the engineering districts; and secures that all public works have the most appropriate quality in construction.

Its most recent activities involved the rehabilitation of selected artesian wells in Basco with the cost of P92,000.

2) Local Development Council/Provincial Development Council (LDC/PDC)

The Batanes Provincial Development Council has the following functions:

(a) Formulate and implement long-term, medium-term and annual socio-economic development plans and policies;
(b) Formulate local investment incentives;
(c) Coordinate, monitor and evaluate the implementation of development plans and projects.

The PDC is headed by the Governor and is composed of mayors of all component municipalities, Chairman of the Committee on Appropriations of the Sangguniang Panlalawigan, Congressman or his representative, and representatives of NGOs operating in the province.

(4) Rural Waterworks and Sanitation Associations (RWSAs)

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. The RWSAs provide Level II or III service. At present, only the Chanarian RWSA is operational in the province.

(5) Barangay Waterworks and Sanitation Association (BWSAs)

Republic Act 6716 mandated the construction of al least one Level I (point source) water supply system in all barangays and the formation of a BWSA to operate and maintain the system/s. The association consists of at least 50 households whose goal is 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.

In the province, there are at present two BWSAs.

(6) Others (including the private sector and NGOs/CBOs).

1) Private Sector

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.

(a) The Batanes Development Foundation Inc. is a provincial-level NGO which conducts research studies community organizing. It has 25 members and has assigned a representative in the Provincial Development Council.

(b) The Batanes Chamber of Commerce was established in 1983 to primarily implement economic enterprise program to stabilize prices of prime commodities.