

JAPAN INTERNATIONAL COOPERATION AGENCY

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

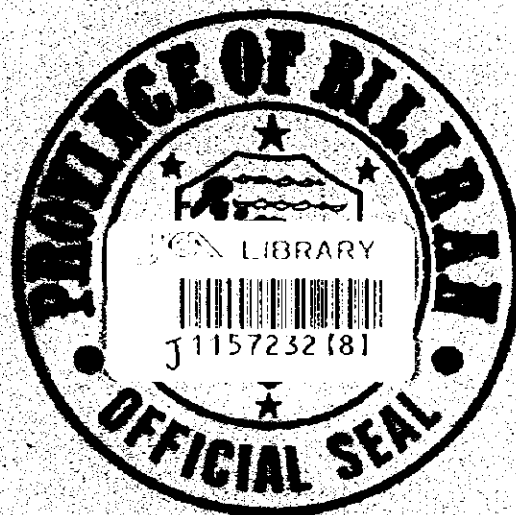
THE STUDY ON THE
PROVINCIAL WATER SUPPLY, SEWERAGE AND
SANITATION SECTOR PLAN
IN
THE REPUBLIC OF THE PHILIPPINES

VOLUME II - (1)

SUPPORTING REPORT

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

BILIRAN



DECEMBER 1999

NIPPON JOGESUIDO SEKKEI CO., LTD.





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**PROVINCIAL WATER SUPPLY, SEWERAGE AND
SANITATION SECTOR PLAN**

VOLUME II SUPPORTING REPORT

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**PROVINCIAL WATER SUPPLY, SEWERAGE AND
SANITATION SECTOR PLAN**

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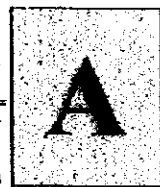
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**PROVINCIAL WATER SUPPLY, SEWERAGE AND
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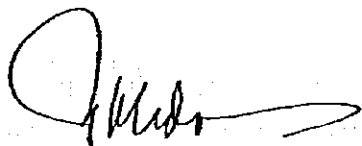
**BACKGROUND INFORMATION
AND EXISTING CONDITIONS**



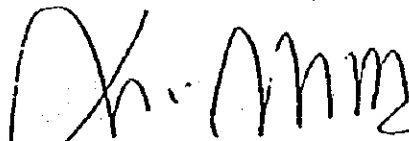
1. INTRODUCTION
1.3 The Provincial Plan for the Province of Biliran
1.3.1 Preparation of the Plan

MINUTES OF DISCUSSIONS
ON
THE INCEPTION REPORT
FOR
THE STUDY ON PROVINCIAL WATER SUPPLY, SEWERAGE AND
SANITATION SECTOR PLANS
FOR
VISAYAS AND MINDANAO
IN
THE REPUBLIC OF THE PHILIPPINES
AGREED UPON BETWEEN
THE DEPARTMENT OF THE INTERIOR AND
LOCAL GOVERNMENT
AND
THE STUDY TEAM OF
JAPAN INTERNATIONAL COOPERATION AGENCY

MANILA, JANUARY 26, 1998



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MR. MASATOSHI MOMOSE
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Japan International Cooperation
Agency

Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, dispatched the Study Team to the Republic of the Philippines on January 13, 1998 to conduct "The Study on Provincial Water Supply, Sewerage and Sanitation Sector Plans for Visayas and Mindanao" (hereinafter referred to as "the Study") in accordance with the Implementing Arrangement for the Study executed between the JICA and the Department of the Interior and Local Government (hereinafter referred to as "DILG") on August 27, 1997.

A series of discussions were made on the Inception Report for the Study between the Study Team and the officials of DILG and other agencies concerned. In the course of the discussions, both parties have agreed with the general approach and methodology, and implementation arrangements detailed in the Inception Report. Also agreed upon were the changes made as to which provinces are to be covered in 1st batch and 2nd batch (refer to 1. Study Area). The list of attendees in the series of discussions is presented in Appendix A.

1. Study Area

The subject twenty-one (21) provinces were grouped into four batches in the "Implementing Arrangement on the Study". However, a delay in the organization of the Provincial Sector Planning Team (PSPT) in the 1st batch provinces of Misamis Oriental and Surigao del Sur prompted their transfer to the 2nd batch. Instead, Davao del Sur and Davao Oriental from the 2nd batch whose PSPTs were already formed were moved up in their place. In this connection, the DILG completed to exchange MOA with the provinces on the participation and full support by the provinces.

The present study area covers the following 21 provinces grouped into four batches.

1 st BATCH	2 nd BATCH	3 rd BATCH	4 th BATCH
1. Agusan del Norte	1. Davao	1. Biliran	1. Aklan
2. Agusan del Sur	2. Misamis Oriental	2. Eastern Samar	2. Antique
3. Davao del Sur	3. Sarangani	3. Leyte	3. Capiz
4. Davao Oriental	4. South Cotabato	4. Northern Samar	4. Iloilo
5. Surigao del Norte	5. Surigao del Sur	5. Southern Leyte	5. Negros
		6. Western Samar	Occidental

With regard to Davao province, the separation into two provinces is currently under legislative process. Upon the formalization of an additional province, the total number of the provinces in the study area would be 22. The DILG has requested that the forthcoming province be included in the study area. The JICA Study Team will relay the request to JICA headquarters for consideration. The DILG is expected to complete the execution of the MOAs of the 2nd batch provinces by early July to catch up with the planned schedule. The required arrangements in terms of subject provinces and study period will be discussed between the DILG and JICA.

2. General Approach and Methodology to the Study

The PW4SPs will be prepared with the full participation of the respective PSPTs together with DILG coordinators and the Study team in accordance with the approach and methodology outlined in the Inception Report. The following topics were confirmed during the discussions:

(1) Planning framework for future sector development

- a) Planning base year is 1997 for 1st and 2nd batches and 1998 for 3rd and 4th batches. Medium-term and long-term target years are 2005 (implementation program: year 2001 to year 2005) and 2010, respectively.
- b) Plan will be prepared in compliance with "Implementing Rules and Regulations of NEDA Board Resolution No. 4".

(2) Standard provision of school toilets

Discussions and confirmation on the provision of school toilets will be arranged with DECS.

(3) Options on the sludge removal from septic tank and its disposal will be shown in the plan.

(4) Model province for 1st batch is Agusan del Sur.

3. Sector Information Collection

The DILG and the JICA Study Team will continuously collect information on the projects/programs assisted by various financial sources. The information will be reflected in the plans.

4. Implementation Set-Up for the Study

In accordance with the Implementing Arrangements between the DILG and the JICA, the DILG shall:

- (1) Secure the safety of the JICA Study Team;
- (2) Assign DILG counterpart staff members who will coordinate and assist PSPTs at the provincial level;
- (3) Set-up PSPTs by respective provincial governments in the study area and secure budget to carry out the Study;
- (4) Through PSPT in each study area province; facilitate and coordinate in data gathering with municipal government and other agencies concerned, and participate in workshops and preparation of PW4SP;

- (5) Facilitate coordination with concerned agencies like DPWH, DOH, NEDA, LWUA and with appropriate bodies.

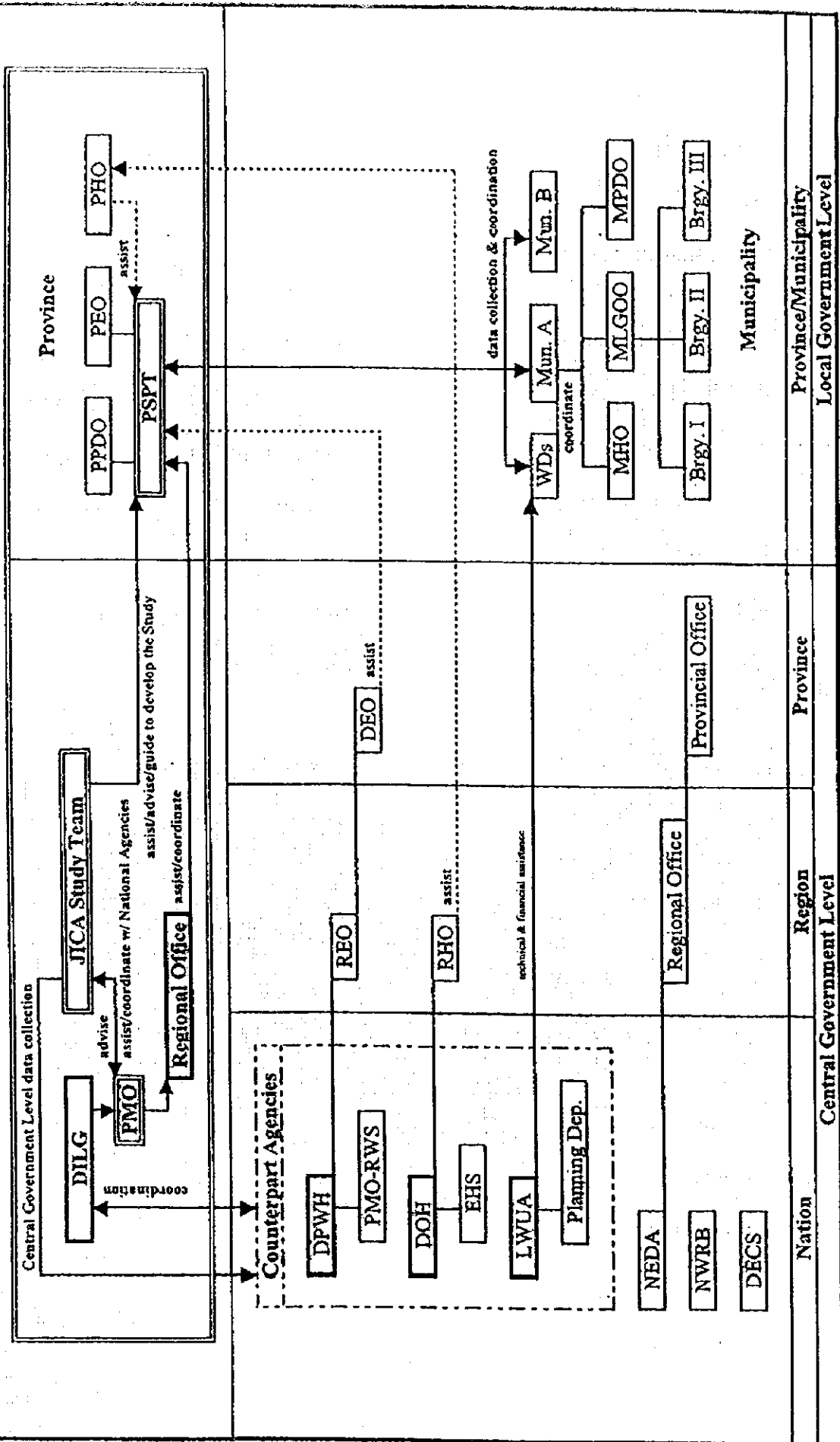
The JICA Study Team shall:

- (1) Pursue technology transfer to the Philippine counterpart personnel in the course of the Study and;
- (2) Assist PSPTs in the preparation of the PW4SP.

LIST OF ATTENDEES IN THE SERIES OF DISCUSSIONS

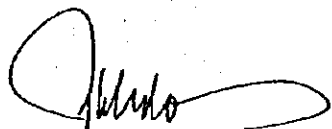
<u>ATTENDEES</u>	<u>DESIGNATION</u>
A. DILG	
1. Mr. Normando J. Toledo	Director, Office of Project Development Services
2. Mr. Orville M. Roque	Program Manager, WSS-PMO
3. Ms. Ellen I. Pascua	Asst. Program Manager, WSS-PMO
4. Mr. Rogelio B. Ocampo	Chief, Planning Division, WSS-PMO
5. Ms. Fe Crisilla M. Banluta	PW4SP Project Officer, WSS-PMO
B. Other Agencies	
1. Mr. Sam Siao	Officer, PMO-RWS, DPWH
2. Dr. Mario Villaverde	Director, EHS, DOH
C. JICA Advisory Committee	
1. Ms. Keiko Yamamoto	Chairman, Advisory Committee
2. Mr. Keiichi Kanaya	Member, Advisory Committee
D. JICA Headquarters	
1. Mr. Shigeyuki Matsumoto	Second Development Study Division, Social Development Study Dept.
E. JICA Study Team	
1. Mr. Masatoshi Momose	Team Leader/Water Supply Planning
2. Mr. Nobuki Abe	Water Supply/Sanitation Engineer
3. Ms. Consuelo B. Estepa	Community Dev't/WID Specialist
4. Ms. Elizabeth L. Verzola	Socio-Economic/Financial Specialist
5. Mr. Kenji Takayanagi	Water Source Development Specialist
6. Mr. Emmanuel L. Patingo	Data Management Specialist

Figure 1.3.1
Organization Chart for Study Implementation

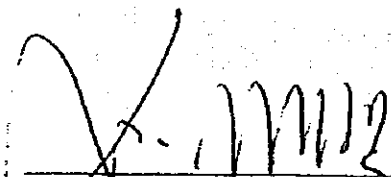


MINUTES OF DISCUSSIONS
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THE PROGRESS REPORT
FOR
THE STUDY ON PROVINCIAL WATER SUPPLY, SEWERAGE AND
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FOR
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THE DEPARTMENT OF THE INTERIOR AND
LOCAL GOVERNMENT
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THE STUDY TEAM OF
JAPAN INTERNATIONAL COOPERATION AGENCY

MANILA, MARCH 18, 1998



MR. NORMANDO J. TOLEDO
Director
Office of the Project Development
Service
Dept. of the Interior and Local Government



MR. MASATOSHI MOMOSE
Team Leader, Study Team
Japan International Cooperation
Agency

The Stage I fieldwork for "the Study on Provincial Water Supply, Sewerage and Sanitation Sector Plan" started on January 13, 1998 and completed on March 23, 1998.

A series of discussions were held throughout the course of the Study, between JICA Study Team and officials concerned including DILG, NEDA, DOH, DPWH and other central government agencies and provinces. The general approach and methodologies, as presented in the Inception Report, have been employed for the fieldwork.

A Progress Report, which covers all outputs during the work period, was prepared entailing part of PW4SP for the respective provinces. The contents of the report were basically agreed upon on March 18, 1998 between JICA Study Team and officials of the DILG. The list of attendees to the meeting is presented in Appendix A. The following issues/problems on the arrangements required for the implementation of the Study were discussed, and the Study Team will relay the modified arrangements required to JICA headquarters.

(1) Modified Arrangements Required for 1st batch Study

1) Due to the presidential election scheduled on May 11, 1998, the second workshop may be held from May 18 to May 22, 1998 after the election, and tentatively starting the 2nd field work on May 13, 1998.

2) The venue for the final workshop was requested by concerned PPDCs to be held in Mindanao rather than in Manila as originally planned. This is because of the financial constraint on the travel expenses required for 7 members of respective PSPTs under the current GOP instruction to LGUs to reduce its planned annual expenditures of up to 25%.

(2) Provinces to be Covered by the 2nd Batch

The total number of provinces for the 2nd batch (5 provinces) will be kept as previously agreed between the two parties. However, Surigao del Sur will be omitted from the Study, since timely establishment of the PSPT by the province seems to be difficult. Instead of the said province, either the newly created Compostela Valley or Bukidnon (Region X) would be included.

The DILG will inform the Study Team of the possibility in the setting up of PSPT by the administration of Compostela Valley by the middle of June 1998. If not, DILG will make an advanced arrangement with Bukidnon.

(3) Electric Resistivity Prospecting and Test Boring

Comparatively reliable data to evaluate the development potential of water source were collected for 1st batch provinces during the fieldwork. It is assumed that the conduct of the field test for groundwater analysis, given a limited period, cannot be able to contribute significantly to the level of accuracy in the preparation of M/P and F/S. The situation will remain the same for 2nd batch provinces. Accordingly, it is not recommended to conduct field test for this study.

The required areas and the scope of work/surveys, such as field tests, will be recommended in the PW4SP and will be considered during detailed design and construction stages.

(4) Time Constraint in Data Collection/Validation/Follow-up

It was found, both by the Study Team and the DILG through the fieldwork, the following problems on data collection/validation/follow-up:

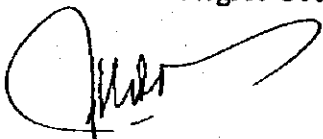
- 1) The summary reports on the sector status prepared by NEDA Regional Office through UNICEF fund were field confirmed as the materials to provide approximate sector situations in the fact of no existence of sector related information at present.
- 2) Data collection by PSPTs had sometimes to be done at the barangay level, due to limited data available in the municipal level. Thus, additional time was required for PSPTs to access to remote rural barangays.
- 3) Comprehensive planning work by the province in Mindanao area is still initial stage. It is necessary for the activities to ensure much more time through intensive technology transfer to DILG coordinators and PSPTs.

Based on the lessons learned, the Study Team and the DILG recognized the need of the review on the allotted period for the activities. The Study Team will relay this matter to JICA headquarters.

(5) Cities to be Covered in the Preparation of PW4SP

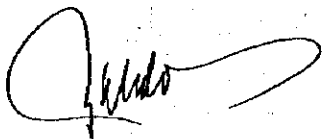
Of the three classes of cities in the Local Government Code, only component cities, which are under the jurisdiction of the provincial government will be considered. The subject cities are as follows:

<u>Province</u>	<u>Component City</u>
Surigao del Norte	Surigao City
Davao	Tagum City and Island Garden City
Leyte	Tacloban City
Western Samar	Calbayog City
Capiz	Roxas City
Iloilo	Passi City
Negros Occidental	Bago City, Cadiz City, La Carlota City, San Carlos City and Silay City



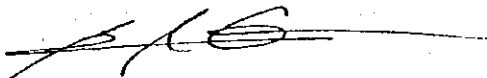
LIST OF ATTENDEES IN THE SERIES OF DISCUSSION

<u>ATTENDEES</u>	<u>DESIGNATION</u>
A. DILG	
1. Mr. Orville M. Roque	Program Manager, WSS-PMO
2. Ms. Ellen I. Pascua	Asst. Program Manager, WSS-PMO
3. Mr. Rogelio B. Ocampo	Chief, Planning Division, WSS-PMO
4. Ms. Fe Crisilla M. Banluta	PW4SP Project Officer, WSS-PMO
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6. Ms. Maria Contessa Navarro	Area Coordinator, WSS-PMO
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2. Mr. Nobuki Abe	Water Supply/Sanitation Engineer
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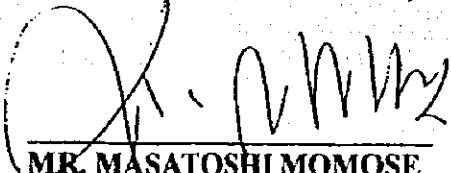


MINUTES OF DISCUSSIONS
ON
THE DRAFT FINAL REPORT
FOR
THE STUDY ON PROVINCIAL WATER SUPPLY, SEWERAGE AND
SANITATION SECTOR PLANS
FOR
VISAYAS AND MINDANAO
IN
THE REPUBLIC OF THE PHILIPPINES
AGREED UPON BETWEEN
THE DEPARTMENT OF THE INTERIOR AND
LOCAL GOVERNMENT
AND
THE STUDY TEAM OF
JAPAN INTERNATIONAL COOPERATION AGENCY

MANILA, AUGUST 27, 1998



MR. BENITO R. CATINDIG
Assistant Secretary for Support
Services and Regional Offices
Dept. of the Interior and Local Government



MR. MASATOSHI MOMOSE
Team Leader, Study Team
Japan International Cooperation
Agency

The Stage II fieldwork for "the Study on Provincial Water Supply, Sewerage and Sanitation Sector Plan" (hereinafter referred to as "the Study") resumed on May 20, 1998 and will be completed on March 30, 1999. Upon completion of the 1st batch study, the study for the 2nd batch will start on August 30 with an "Orientation Workshop". It is further scheduled that the 2nd batch study will be finalized by February 1999 and 3rd batch work will be commenced before the completion of this fieldwork.

Major conditions and assumptions for the development of Medium-Term and Long-Term sector plans for the subject provinces under the 1st batch were discussed and finalized between respective PSPTs and the JICA Study Team (hereinafter referred to as "the Team") through Workshop No. 2 (held between May 26 and 28, 1998) and during planning work thereafter. In this connection, the target year for the Medium-Term development plan was revised from 2005 to 2003 in order to realize the plan earlier.

The Draft Final Reports for the five (5) provinces of the 1st batch were prepared and the final workshop was conducted between August 24 and 26, 1998 to present and discuss the contents of the reports. The contents of the reports were basically agreed upon on August 27, 1998 by the Team and officials concerned on the Philippine side. The list of attendees to the meeting is presented in Appendix A. The following were confirmed and agreed upon by both parties.

1. Correction of typographical errors of the Draft Final Report will be undertaken by the Team prior to printing of the Final Report. The Final Report will be submitted by October 1998.
2. Adoption of the Plans by the Provincial Council (Sangguniang Panlalawigan) shall be facilitated by the DILG.
3. Inclusion of the Message of the Governor in the Main Report of respective PW4SPs.

With regard to the 2nd batch study, both parties have agreed on the general approach and methodology, and implementation arrangements adopted for the 1st batch study. Among them, the following are the basic conditions to be applied for the planning.

(1) Study Area

The DILG completed the exchange of MOA with the 2nd batch provinces on the participation and full support by the concerned provinces. The subject provinces are Misamis Oriental, Bukidnon, Davao del Norte, South Cotabato and Sarangani. The province of Bukidnon was selected for model province study.

(2) Planning Framework for Future Sector Development

- a) Planning base year is 1997 and Medium-Term and Long-Term target years are 2003 (implementation program: year 1999 to year 2003) and 2010, respectively.
- b) Plans will be prepared in compliance with the "Implementing Rules and Regulations of NEDA Board Resolution No. 4".

(3) Implementation Set-Up/Arrangements for the Study

The study will be conducted in accordance with the Implementing Arrangements between the DILG and the JICA, as done with the 1st batch study.

Both parties will make timely and effective arrangements through the study period to achieve the purpose of the Study within the set time-table based on the lessons learned from the 1st batch study. In this regard, the following are put into practice.

- a) Data collection by the PSPTs will be commenced in advance (overlapped activity with the preceding batch study) to ensure longer period for this activity as compared with the original time allotted.
- b) Planning period by the PSPTs will be extended by adjusting the timing for the conduct of 2nd workshop for data encoding and discussions to set-up planning fundamentals.
- c) Practical arrangements will be made to increase the opportunities for further collaboration in the planning work among PSPTs, DILG coordinators and the Team.

For the arrangement of the 3rd batch study, the DILG will confirm the subject provinces including the model province through the MOA by December 1998.


LIST OF ATTENDEES IN THE SERIES OF DISCUSSIONS

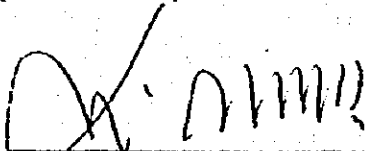
<u>ATTENDEES</u>	<u>DESIGNATION</u>
<i>A. DILG</i>	
1. Mr. Normando J. Toledo	Director, Office of Project Development Services
2. Ms. Ellen I. Pascua	Acting Program Manager, WSS-PMO
3. Mr. Rogelio B. Ocampo	Chief, Planning Division, WSS-PMO
4. Ms. Fe Crisilla M. Banluta	PW4SP Project Officer, WSS-PMO
<i>B. Other Agencies</i>	
1. Ms. Cristina Santiago	PIS, NEDA
<i>C. JICA Advisory Committee</i>	
1. Ms. Keiko Yamamoto	Chairman, Advisory Committee
2. Mr. Keiichi Kanaya	Member, Advisory Committee
<i>D. JICA Headquarters</i>	
1. Ms. Akiko Hayashi	Second Development Study Division, Social Development Study Depart.
<i>E. JICA Study Team</i>	
1. Mr. Masatoshi Momose	Team Leader/Water Supply Planning
2. Mr. Nobuki Abe	Water Supply/Sanitation Engineer
3. Mr. Kenji Hiramatsu	Institutional Specialist
4. Ms. Consuelo B. Estepa	Community Dev't./Gender Specialist
5. Ms. Elizabeth L. Versola	Socio-Economic/Financial Specialist
6. Mr. Emmanuel L. Patingo	Data Management Specialist

MINUTES OF DISCUSSIONS
ON
THE DRAFT FINAL REPORT (2nd BATCH)
FOR
THE STUDY ON PROVINCIAL WATER SUPPLY, SEWERAGE AND
SANITATION SECTOR PLANS
FOR
VISAYAS AND MINDANAO
IN
THE REPUBLIC OF THE PHILIPPINES

AGREED UPON BETWEEN
THE DEPARTMENT OF THE INTERIOR AND
LOCAL GOVERNMENT
AND
THE STUDY TEAM OF
JAPAN INTERNATIONAL COOPERATION AGENCY

QUEZON CITY, FEBRUARY 22, 1999


MR. BENITO R. CATINDIG
Assistant Secretary
Dept. of the Interior and Local Government


MR. MASATOSHI MOMOSE
Team Leader, Study Team
Japan International Cooperation Agency

The Stage II fieldwork for "the Study on Provincial Water Supply, Sewerage and Sanitation Sector Plan" (hereinafter referred to as "the Study") resumed on May 20, 1998 and will be completed on March 30, 1999.

The study for the 2nd batch started on August 30, 1998 and will be completed with the final workshop scheduled between February 24 and 26, 1999. During the finalization stage of the 2nd batch study, the study for the 3rd batch was started with an "Orientation Workshop" on February 8 to 10, 1999. It is further scheduled that the 3rd batch study will be finalized by the end of this year.

With regard to the 2nd batch study, major conditions and assumptions for the development of Medium-Term and Long-Term sector plans for the subject provinces were discussed and finalized between the respective PSPTs and the JICA Study Team (hereinafter referred to as "the Team") during Workshop No. 2 between November 4 to 6, 1998 and also at the time of the planning work thereafter. For the entire duration of the planning work, the Team stayed intermittently in Davao City, Cagayan de Oro City and Malaybalay City for better collaboration with the PSPTs.

The Draft Final Reports for the five (5) provinces of the 2nd batch were prepared and discussed on the contents of the reports between the respective PSPTs and the Team during February 15 and 19, 1999. The contents of the reports were basically agreed upon on February 22, 1999 by the Team and the officials concerned in the Philippine side in consideration of the discussion results with PSPTs.

The list of attendees to the meeting on February 22, 1999 is presented in Appendix A. The followings were confirmed and agreed upon by both parties.

1. Further modification/correction on the Draft Final Report will be undertaken by the Team prior to printing of the Final Report based on the discussions with PSPTs. The Final Report will be sent by May, 1999.
2. Adoption of the Plans by the Provincial Council (Sanggunian Panlalawigan) will be pursued and facilitated by the DILG.
3. Inclusion of the Message of the Governor in the Main Report of respective PW4SPs.

Concerning the 3rd batch study, both parties have agreed on the general approach and methodology, and implementation arrangements adopted for the previous batch studies. Among others, the followings are the basic conditions to be applied for the planning.

(1) Study Area

The DILG completed the exchange of MOAs with the 3rd batch provinces regarding the participation and full support by the concerned provinces. The subject provinces are Northern Samar, Eastern Samar, Samar, Biliran, Leyte and Southern Leyte. The province of Leyte was selected for model province study.

(2) Planning Framework for Future Sector Development

- a) Planning base year is 1998 and Medium-Term and Long-Term target years are 2004 (implementation program: year 2000 to year 2004) and 2010, respectively.
- b) Plans will be prepared in compliance with the "Implementing Rules and Regulations of NEDA Board Resolution No. 4", Series of 1994.

(3) Implementation Set-Up/Arrangements for the Study

The study will be conducted in accordance with the Implementing Arrangements between the DILG and the JICA, as done with the 1st and 2nd batch studies.

Both parties will make timely and effective arrangements throughout the study period to achieve the purpose of the Study within the set time-table based on the lessons learned from previous batch studies. In this regard, the following will be put into practice.

- a) Data collection by the PSPTs will start in advance (overlapped activity with the preceding batch study) to ensure longer period for this activity as compared with the original time allotted.
- b) Planning period by the PSPTs will be extended by adjusting the timing for the conduct of the 2nd workshop for data encoding and discussions to set-up planning fundamentals.
- c) Practical arrangements will be made to increase the opportunities for further collaboration in the planning work among PSPTs, DILG coordinators and the Team.

For the arrangement of the 4th batch study, the DILG will confirm the subject provinces including the model province through a MOA by May, 1999.

LIST OF ATTENDEES IN THE SERIES OF DISCUSSIONS

	<u>ATTENDEES</u>	<u>DESIGNATION</u>
<i>A.</i>	<i>DIIG</i>	
1.	Mr. Benito R. Catindig	Assistant Secretary
2.	Ms. Ellen I. Pascua	Program Manager, WSS-PMO
3.	Mr. Rogelio B. Ocampo	Chief, Planning Division, WSS-PMO
4.	Ms. Fe Crisilla M. Bauluta	PW4SP Project Officer, WSS-PMO
<i>B.</i>	<i>Other Agencies</i>	
1.	Ms. Christina Santiago	PIS, NEDA
<i>C.</i>	<i>JICA Advisory Committee</i>	
1.	Ms. Keiko Yamamoto	Chairman, Advisory Committee
2.	Mr. Keiichi Kanaya	Member, Advisory Committee
<i>D.</i>	<i>JICA Study Team</i>	
1.	Mr. Masatoshi Momose	Team Leader/Water Supply Planning
2.	Mr. Nobuki Abe	Water Supply/Sanitation Engineer
3.	Mr. Kenji Hiramatsu	Institutional Specialist
4.	Mr. Nobukatu Sakiyama	Water Source Specialist
5.	Ms. Consuelo B. Estepa	Community Dev't./Gender Specialist
6.	Ms. Elizabeth L. Versola	Socio-Economic/financial Specialist
7.	Mr. Emmanuel Patingo	Data Management Specialist

2. PLANNING APPROACH FOR FUTURE SECTOR DEVELOPMENT

2.6 Planning Principles and Data Management

2.6.2 Data Management

(I) Computer-based System

The data management system was established to support the Provincial Sector Planning Team (PSPT) in the preparation of the Provincial Water Supply, Sewerage and Sanitation Sector Plan (PW4SP). An essential task of data management is to organize various kind of data an effective and efficient information base.

A computer-based system was applied as a viable solution to process large amount of data and to minimize the human-error in calculation. For this particular project, a dynamic system is designed to allow the planner to adjust planning factors and update the information when further data becomes available.

It is viable and economical t choose the microcomputer with software suitable for the average skills of the common user. In this connection, of the two types of software package available, database and spreadsheet, the latter method was selected. Among the available spreadsheet-type software, EXCEL was used. Excel support file conversion (opening and saving), multiple file opening, graphic presentation of data, What-You-See-Is-What-You-Get (WYSIWYG) formatting, scaleable font and view, etc. The following are the advantage and disadvantages of the spreadsheet method with reference to database method.

Advantage	Disadvantage
1. Minimum programming skills	1. Repeated entry of same formula
2. Friendly environment to users	2. Sorting or indexing is done manually
3. Graphics presentation of data at user's option.	3. All data are loaded in memory, which require huge amount of memory.
4. Execution of data linkages at formula level entry	4. Limited to static data linkages
5. Guided formula creation using function wizard	

Data management task starts from the collection of data using the questionnaire forms. The existence and accuracy of data are major concern at this stage to prepare main information bases. Using the microcomputer provided with EXCEL spreadsheet, data in the questionnaire forms are transferred into the forms constructed in EXCEL. Applicable policy, criteria and assumption are entered into key parameter tables. These data are then processed and finally consolidated into target forms. These final provide a map of provincial profile, service coverage, future requirements, cost estimates for future sector development, and funding requirements.

Table 2.6.1 Key Parameter

No.	Description of Key Parameter		Unit	Values
1.	Service Level	<i>Water Supply</i>		
		Number of household to be served by Level I Facility	HH/Source	
		Number of household to be served by Level II System	HH/Public Faucet	
		Water Consumption Rate for Level III System	Liter/capita/day	
		<i>Sanitation</i>		
		Std. number of student to be served by a unit of Sanitary toilet	Student/Toilet	
		Standard number of toilets for a public utility	Toilet/Public Facility	
2.	Provincial Sector Target	Medium Term Plan	<i>Water Supply</i>	
			Urban Water Supply	% of Population
			Rural Water Supply	% of Population
			<i>Sanitation</i>	
			Household Toilet	
			Urban Household Toilet	% of Household
			Flush	% of Household
			Pour Flush	% of Household
			VIP Latrine	% of Household
			Rural Household Toilet	% of Household
			Flush	% of Household
			Pour Flush	% of Household
			VIP Latrine	% of Household
			School Toilet	% of Public Student
			Public Toilet	% of Public Utility
		Solid Waste	% of Population	
		Long Term Plan	<i>Water Supply</i>	
			Urban Water Supply	% of Population
			Rural Water Supply	% of Population
			<i>Sanitation</i>	
			Household Toilet	
			Urban Household Toilet	% of Household
			Flush	% of Household
			Pour Flush	% of Household
			VIP Latrine	% of Household
			Rural Household Toilet	% of Household
			Flush	% of Household
Pour Flush	% of Household			
VIP Latrine	% of Household			
School Toilet	% of Public Student			
Public Toilet	% of Public Utility			
Urban Sewerage	% of Urban Population			
3.	Percentage of Level I Deep Wells to be Rehabilitated		%	
4.	Percentage of Sector Management Cost to Construction Cost			
	Feasibility and Detail Design		% of Construction Cost	
	Construction Supervision			% of Construction Cost
5.	Community Development and Training Cost			
	Level III		% of Construction Cost	
	Level I, II and Public Toilet			% of Construction Cost
6.	Recurrent Cost	Level III System (Operating Cost)		Pesos/HH/year
		Level III System (Spare Parts/Equipment)		% of Construction Cost
		Level II System (Spare Parts/Equipment)		Pesos/HH/year
		Level I System (Spare Parts/Equipment)		Pesos/HH/year
		Public School Toilet Maintenance Cost		Pesos/Toilet/year
	Public Utility Toilet Maintenance Cost			Pesos/Toilet/year
7.	Allocation factors/Percentages of IRA			
	From Provincial		%	
	From Municipality and Brgy.			%
8.	Funding Levels/Percentages for Different Financing Scenarios			
	1st Scenario		% Funding Available	
	2nd Scenario		% Funding Available	
	3rd Scenario		% Funding Available	
	4th Scenario		% Funding Available	
	5th Scenario			% Funding Available

Table 2.6.2 Composition of Well Sources and Specific Capacity

Name of Municipality	Type	Type Water Source	Proportion (%)	Standard Specification		
				Depth (m)	SWL (m)	Specific Capacity (liter/sec/m)
	Urban	Shallow Well				
		Deep Well				
		Spring				
	Rural	Shallow Well				
		Deep Well				
		Spring				
	Urban	Shallow Well				
		Deep Well				
		Spring				
	Rural	Shallow Well				
		Deep Well				
		Spring				
	Urban	Shallow Well				
		Deep Well				
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		Deep Well				
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	Urban	Shallow Well				
		Deep Well				
		Spring				
	Rural	Shallow Well				
		Deep Well				
		Spring				
	Urban	Shallow Well				
		Deep Well				
		Spring				
	Rural	Shallow Well				
		Deep Well				
		Spring				

Sub-Sector	Component	1999	2000	2001	2002	2003	Total
Urban Water Supply	Level III System						
	Feasibility Study and Detail Design						
	Construction & Supervision Community Development & Training						
Rural Water Supply	Level I Facility						
	Detail Design						
	Construction & Supervision						
	Community Development & Training						
	Level II System						
	Detail Design						
Sanitation	Construction & Supervision						
	Community Development & Training						
	Urban Household Toilet						
	Rural Household Toilet						
	Public School Toilet						
	Public Toilet						
	Disinfection of Level I Wells						

Table 2.6.4 Level I Safe & Unsafe Percentage

Name of Municipality	Safe (%)	Unsafe (%)
Provincial Total		

Table 2.6.5 Unit Construction Cost of Different Facilities

Description	Unit Construction Cost (Pesos)	Service Coverage		Unit Cost	
		Served Population	Served Household	Pesos/ Person	Pesos/ Household
Water Supply					
<i>Level III - New System</i>					
For 5000 Population					
For 10000 Population					
For 15000 Population					
<i>Level III - Expansion</i>					
For 5000 Population					
For 10000 Population					
For 15000 Population					
<i>Level II</i>					
<i>Level I</i>					
Deep Well - 40 meter depth					
Deep Well - 80 meter depth					
Deep Well - 120 meter depth					
Shallow Well - 18 meter depth					
Spring Development					
<i>Rehabilitation Cost for Level I Deep Well</i>					
<i>Disinfection of Level I Wells</i>					
Sanitation					
Flush					
Pour Flush					
VIP / Dry					
School Toilet					
Public Toilet					
Urban Sewerage					

Table 2.6.6 Scoring Factor for Municipal Investment Ranking for Urban Water Supply

Score	Underserved and Unserved Population in Base Year	Underserved and Unserved Population in Phase I	Population Unserved by Level III Systems in Base Year
1.0	< %	< %	< %
0.8	< % < 40	< % <	< % <
0.6	< % < 30	< % <	< % <
0.4	< % < 20	< % <	< % <
0.2	% < 10	% <	% <
Weight Allocation Score (%)			

Table 2.6.7 Scoring Factor for Municipal Comprehensive Investment Ranking

Score	Urban Water Supply	Rural Water Supply	Urban Sanitation	Rural Sanitation
1.0	N.A.	< %	< %	< %
0.8	N.A.	< % <	< % <	< % <
0.6	N.A.	< % <	< % <	< % <
0.4	N.A.	< % <	< % <	< % <
0.2	N.A.	% <	% <	% <
Weight Allocation Score (%)				

3. PROVINCIAL PROFILE

3.3 Socio-economic Conditions

3.3.1 Economic Activities and Family Income

Table 3.3.1 Distribution of Families by Income Class

Income Class	Biliran				Region VIII	
	Total Number of Families		Annual Income		Total Number of Families	Annual Income Average (Pesos)
	Number	Share	Total (P '000.00)	Average (Pesos)		
Under 15,000	3,222	13	44,473	13,803	87,207	13,748
15,000 - 19,999	2,524	10	58,166	23,045	85,948	22,862
20,000 - 29,999	6,798	27	206,829	30,425	180,372	30,065
30,000 - 39,999	5,027	20	214,939	42,757	137,133	42,930
40,000 - 59,999	4,635	18	282,234	60,892	120,101	62,345
60,000 - 99,999	2,203	9	244,879	111,157	58,068	112,836
100,000 - 249,999	1,169	5	225,582	192,970	23,431	232,048
250,000 and over	68	0	32,110	472,207	1,418	473,960

Source: 1994 Family Income and Expenditures Survey by NSO

Notes:

- (1) Derived from Region VIII FIES; Biliran figures were adopted from the figures of Leyte Province.
- (2) Based on NEDA and other agencies, poverty threshold in Region VIII was estimated at P-37,053 (P 6,444 annual per capita poverty threshold).
- (3) For purposes of the survey, a family is defined as a group of persons usually living together and composed of the head and other persons related by blood, marriage and adoption. A single person living alone is considered as a separate family. A household is composed of 1 or more families in the same housing unit and has a common arrangement of food preparation and consumption.

Table 3.3.2 Employment by Major Industry Group and Class of Worker, 1994

Major Industry Group	Household Population 15 years and Over Who Worked	Class of Worker							Not Reported
		Worked for Private Household (Domestic Services)	Worked for Private Business/ Enterprise/ Farm	Worked for Government/ Government Corporation	Self-employed Without Any Paid Employee	Employer In Own Farm or Business	Work With Pay in Own Family Operated Farm or Business	Work Without Pay in Own Family Operated Farm or Business	
Agriculture, Hunting and Forestry	26,940	54	7,802	62	10,450	1,511	380	6,665	16
Fishing	6,896	14	857	1	4,034	208	46	1,725	14
Mining and Quarrying	22		3		5	2	0	12	
Manufacturing	1,667	11	633	5	825	33	8	143	4
Electricity, Gas and Water	129	4	91	7	26			1	
Construction	2,520	21	2,255	18	200	11		10	5
Trade	4,330	10	490	11	2,891	110	33	715	10
Services	11,809	4,213	2,199	3,974	1,140	57	4	208	14
Not Stated	76	3	35	7	15			7	9
Provincial Total	54,389	4,330	14,365	4,083	19,536	1,932	471	9,551	69

Source: 1995 NSO Socioeconomic and Demographic Characteristic

3.3.3 Education

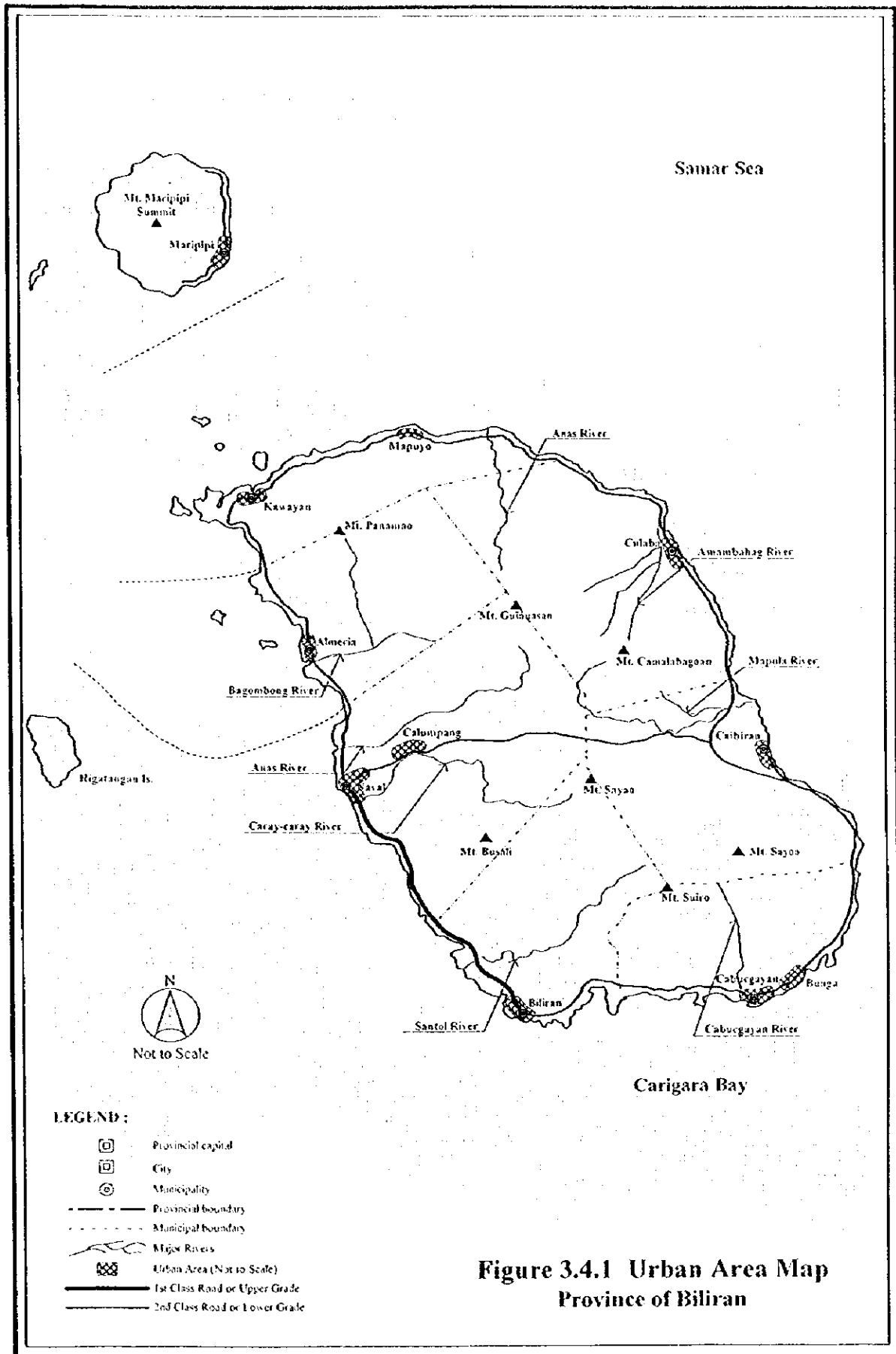
Table 3.3.3 Household Population by Highest Educational Attainment

Highest Educational Attainment	Household Population 5 years Old and Over	Age Group				
		Below 20	20 - 24	25 - 29	30 - 34	35 and Over
No Grade Completed	10,140	6,443	227	201	192	3,077
Pre-school	4,515	4,262	17	25	19	192
Elementary						
1st - 4th Grade	34,092	17,830	1,561	1,517	1,514	11,670
5th - 7th Grade	27,157	8,288	2,178	2,387	2,314	11,990
High School						
Undergraduate	16,238	8,222	1,988	1,510	1,171	3,347
Graduate	7,631	1,596	1,526	1,240	987	2,282
Post Secondary						
Undergraduate	111	22	39	26	7	17
Graduate	640	46	215	131	95	153
College Undergraduate	5,521	1,242	1,486	801	608	1,384
Academic Degree Holder	6,007	67	989	1,141	1,046	2,764
Post-Baccalaureate	136	0	8	10	21	97
Not Stated	600	365	39	29	20	147
Total	112,788	48,383	10,273	9,018	7,994	37,120

Source: 1995 NSO Socioeconomic and Demographic Characteristic

3.4 Population

3.4.1 Classification of Urban and Rural Area



**Figure 3.4.1 Urban Area Map
Province of Biliran**

3.5 Health Status

Table 3.5.1 Number and Ratio of Population to Health Facilities and/or Medical Practitioners

Health Facilities and Practitioners	Biliran		Philippines	
	Number	Ratio	Number	Ratio
Health Facilities				
Hospital	1	1/136,851	1,700	1/40,206
Rural Health Units	8	1/17,129	2,335	1/29,272
Barangay Health Station	36	1/3,806	11,646	1/5,869
Practitioners				
Doctors	22	1/6,229	6,913	1/9,887
Nurses	25	1/5,481	8,849	1/7,724
Midwives	46	1/2,979	10,831	1/6,311
Dentists	6	1/22,839	1,895	1/36,068
Others Medical Practitioner				

Source: PSPT and 1997 Philippine Statistical Yearbook.

3.6 Environmental Conditions

3.6.2 Water Pollution

Table 3.6.1 Types of Drainage Facilities

Type	Length (km)
Drainage Main	2
Open Channel (with Concrete & rubble masonry)	6
Open Ditches & Unlined Laterals	22
Reinforced Concrete Circular Pipes	2
Street Gutters	0
Outfalls to rivers from drainage mains (number)	2

Source: PSPT

Table 3.6.2 DENR Water Quality Criteria/Water Usage and Classification for Fresh Water

Parameter	Unit	Class AA	Class A	Class B	Class C	Class D
Color	PCU	15	50	(C)	(C)	(C)
Temperature (max. rise in deg. Celsius)	°C rise	--	3	3	3	3
pH (range)		6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.0-9.0
Dissolve Oxygen (Minimum)	%satn	70	70	70	60	40
	mg/l.	5.0	5.0	5.0	5.0	3.0
5-Day 20°C BOD	mg/l.	1	5	5	7(10)	10(15)
Total Suspended Solids	mg/L	25	50			
Total Dissolved Solids	mg/L	500	1,000	--	--	1,000
Surfactants (MBAS)	mg/L	nil	0.2(0.5)	0.3(0.5)	0.5	--
Oil/Grease (Petroleum Ether Extract)	mg/L	nil	1	1	2	5
Nitrate as Nitrogen	mg/L	1	10	NR	10	--
Phosphate as Phosphorous	mg/L	nil	0.1	0.2	0.4	--
Phenolic Substances as Phenols	mg/L	nil	0.002	0.005	0.02	--
Total Coliforms	MPN/100mL	50	1,000	1,000	5,000	--
or Fecal Coliforms	MPN/100mL	20	100	200	--	--
Chloride as Cl	mg/l	250	250	--	350	--
Copper	mg/L	1	1	--	0.05	--

Notes:

Class AA - Public Water Supply Class I. Intended for waters having watersheds that are uninhabited and otherwise protected and which require only approved disinfection in order to meet the national standards for drinking water.

Class A - Public Water Supply Class II. Sources of water supply that will require complete treatment (coagulation, sedimentation, filtration and disinfection) in order to meet drinking water standards.

Class B - Recreational Water Class I. For primary contact recreation such as bathing, swimming skin diving, etc. (particularly for tourism purposes).

Class C - Fishery Water for the propagation and growth of fish and other aquatic resources; recreational (for boating, etc.); industrial water supply class I for manufacturing processes after treatment.

Class D - For agriculture, irrigation, livestock watering, etc.; for industrial water supply class II (cooling, etc.); other inland waters by their quality, belong to this specification.



4. EXISTING FACILITIES AND SERVICE COVERAGE

4.1 Water Supply

4.1.3 Level III Systems

Table 4.1.1 Details on Existing Level III Systems
Sheet 1 of 4

Name of Municipality	Name of Operating Body	Level III Service								
		Number of Barangays Served			Number of Households Served			Number of Population Served		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Almeria	Almeria WWS	1	6	7	492	1,193	1,687	2,567	6,573	9,140
Biliran	LGU-Biliran	2		2	320		320	1,920		1,920
Cabucgayan	Sitio Naga WWS	3	2	5	200	400	600	1,600	2,000	3,600
Caibiran	Caibiran WWS	1		1	147		147	1,032		1,032
	Caibiran WWS	2	1	3	464	54	518	2,784	324	3,108
	Municipal Total	3	1	4	611	54	665	3,816	324	4,140
Culaba	Bool RWSA		4	4		273	273		1,638	1,638
	Culaba Central	3		3	304		304	2,128		2,128
	Kalipayan		1	1		16	16		96	96
	Pinamhagan		1	1		20	20		140	140
	Municipal Total	3	6	9	304	309	613	2,128	1,874	4,002
Kawayan	Baganito		1	1		20	20		100	100
	Bahite WW	1		1	90		90	428		428
	Bilwang WW		1	1		6	6		30	30
	Bulalacao WW		1	1		5	5		25	25
	Burabod WW		1	1		35	35		175	175
	Inasuyan		1	1		50	50		250	250
	Kansanoc WW		1	1		20	20		100	100
	Madao WW		1	1		50	50		250	250
	Mapuyo WW		1	1		63	63		378	378
	Masagaosab WW		1	1		25	25		125	125
	Masagongsong		1	1		55	55		275	275
	Poblacion WW	1		1	121		121	605		605
	San Lorenzo WWS		1	1		15	15		75	75
	Tabunan-North		1	1		15	15		75	75
	Tubig Guinoo WW		1	1		30	30		150	150
	Tucdao WW		1	1		108	108		540	540
Ungale WW		1	1		80	80		400	400	
V. Comejo WW		1	1		15	15		75	75	
Municipal Total	2	16	18	211	592	803	1,033	3,023	4,056	
Naval (Capital)	Naval WD	3	8	11	1,926	770	2,696	9,630	3,850	13,480
Provincial Total		17	39	56	4,064	3,320	7,384	22,694	17,644	40,338

Table 4.1.1 Details on Existing Level III Systems

Sheet 2 of 4

Name of Municipality	Name of Operating Body	Level III Service								
		Number of Public Faucets			Number of Households Served			Number of Population Served		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Almeria	Almeria WWS									
Biliran	I.GU-Biliran	11		11	55		55	330		330
Cabucgayan	Sitio Naga WWS		9	9		45	45		270	270
Caibiran	Caibiran WWS	2		2	12		12	30		30
	Caibiran WWS		6	6		32	32		192	192
	Municipal Total	2	6	8	12	32	44	30	192	222
Culaba	Bool RWSA		2	2		10	10		60	60
	Culaba Central									
	Kalipayan		4	4		28	28		88	88
	Pinamihagan		6	6		30	30		210	210
	Municipal Total		12	12		68	68		358	358
Kawayan	Baganito		13	13		65	65		325	325
	Balite WW	23		23	100		100	475		475
	Bilwang WW		10	10		50	50		250	250
	Bulalacao WW		10	10		50	50		250	250
	Burabod WW		10	10		50	50		250	250
	Inasuyan		20	20		100	100		500	500
	Kansanoc WW		11	11		55	55		275	275
	Madao WW		20	20		100	100		500	500
	Mapuyo WW		25	25		125	125		750	750
	Masagaosao WW		10	10		50	50		250	250
	Masagongsong		7	7		35	35		175	175
	Poblacion WW	10		10	50		50	250		250
	San Lorenzo WWS		18	18		90	90		450	450
	Tabunan-North		1	1		5	5		25	25
	Tubig Guinoo WW		15	15		75	75		375	375
	Tucdao WW		26	26		130	130		650	650
	Ungale WW		25	25		125	125		625	625
	V. Cornejo WW		12	12		60	60		300	300
Municipal Total		33	233	266	150	1,165	1,315	725	5,950	6,675
Naval (Capital)	Naval WD									
Provincial Total		46	260	306	217	1,310	1,527	1,085	6,770	7,855

Table 4.1.1 Details on Existing Level III Systems

Sheet 3 of 4

Name of Municipality	Name of Operating Body	Water Sources			Consumption			
		Type ¹	Number	Production (cu.m/day)	Domestic	Institutional	Commercial	Industrial
					(cu.m/day)			
Almeria	Almeria WWS	SP	5		15	20		
Biliran	LGU-Biliran	SP	1	361	361			
Cabucayan	Sitio Naga WWS							
Caibiran	Caibiran WWS	SP	1					
	Caibiran WWS	SP	1					
	Municipal Total	SP	2					
Culaba	Bool RWSA	SP	1	2,160	1,375			
	Culaba Central	SP	1	2,640				
	Kalipayay	SP	1	864	864			
	Pinamihagan	SP	1	167				
	Municipal Total	SP	4	5,831	2,239			
Kawayan	Baganito	SP	1					
	Balite WW	SP	1					
	Bilwang WW	SP	1					
	Bulalacao WW	SP	1					
	Burabod WW	SP	1					
	Inasuyan	SP	1					
	Kansanot WW	SP	1					
	Madao WW	SP	1					
	Mapuyo WW	SP	1					
	Masagaosao WW	SP	1					
	Masagongsong	SP	1					
	Poblacion WW	SP	1					
	San Lorenzo WWS	SP	1					
	Tabunan-North	SP	1					
	Tubig Guinoo WW	SP	1					
	Tucdao WW	SP	1					
	Ungale WW	SP	1					
	V. Cornejo WW	SP	1					
Municipal Total	SP	18						
Naval (Capital)	Naval WD	SP	1	2,765				
Provincial Total			31	8,957	2,615	20		

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

Table 4.1.1 Details on Existing Level III Systems
Sheet 4 of 4

Name of Municipality	Name of Operating Body	Consumers														
		Domestic House Connections			Domestic Public Faucets			Institutional Consumers			Commercial Consumers			Industrial Consumers		
		Connection		Consumption (m ³ /day)	Connection		Consumption (m ³ /day)	Connection		Consumption (m ³ /day)	Connection		Consumption (m ³ /day)	Connection		Consumption (m ³ /day)
Metered	Unmetered	Metered	Unmetered		Metered	Unmetered		Metered	Unmetered		Metered	Unmetered				
Almeria	Almeria WWS	1,078			1		15.00	8		20.00						
Biliran	LGU-Biliran	412		361.00	5	6										
Cabugayan	Sitio Naga WWS		432													
Caibiran	Caibiran WWS		147					1			21					
	Caibiran WWS		464							4						
	Municipal Total		611					1		25						
Culaba	Bool RWSA		273	1,365.00		3	10.00									
	Culaba Central															
	Kalipayan		16	691.20		4	172.80									
	Municipal Total		289	2,056.20		6	182.80									
Kawayan	Baganika		20			13										
	Balric WW		90			23										
	Bilwang WW		6			10										
	Bulalacao WW		5			10										
	Burabod WW		35			10										
	Inasuyan		50			20										
	Kansuoc WW		20			11										
	Madao WW		50			20										
	Mapuyo WW		63			25										
	Masagaosao WW		25			10										
	Masagongsong		55			7										
	Poblacion WW		121			10										
	San Lorenzo		15			18										
	Tabunan-North		15			1										
	Tubig Guinoo		30			15										
	Tuedao WW		108			26										
Ungale WW		80			25											
V. Comejo WW		15			12											
	Municipal Total		803			266										
Naval (Capital)	Naval WD	2,696		1,325.64				62		2.42	364		1.03			
Provincial Total		4,186	2,135	4,143	6	278	197.80	70	1	22.42	364	25	1.03			

4.1.4 Level II Systems

Table 4.1.2 Details on Existing Level II Systems
Sheet 1 of 6

Name of Municipality	Name of Operating Body	Water Source			Existing Facilities				
		Type	Number	Discharge (m ³ /day)	Length of Transmission Line (meter)	Reservoir		Length of Distribution Line (meter)	Number of Public Faucets
						Number	Volume (m ³)		
Almeria	Iyosan BWS	SP			4,200			500	14
	Jamorwon BWS	SP	1	432.0	2,500			400	10
	Pulang Bato BWS	SP			3,000	2	13.8	500	12
	Salangi BWS	SP			1,500			200	12
	Sampao BWS	SP			1,100			200	8
	Tabunan BWS	SP			800			300	9
	Municipal Total	SP	1	432.0	13,100	2	13.8	2,100	65
	Bato	SP				1			2
	Burabod	SP	1	129.6	6,000	2	4.5	1,000	40
	Busali	SP	1	17.3	30,000	1	3.0	1,080	54
Biliran	Camila	SP				1			3
	Hugpa	SP				1			5
	Julita	SP				2			5
	Pinangumhan	SP							3
	Sanggalang	SP				1			6
	Villa Enage (Baras)	SP			4,000	1		600	17
	Municipal Total	SP	2	146.9	40,000	10	7.5	2,680	135
	Balaquid BWSA	SP	1	345.6	2,500	2	6.8	1,000	4
	Baso BWSA	SP	1	259.2	3,000			500	2
	Cabucgayan	Bunga BWSA				3,000	1	100.0	1,500
Caambongan BWSA		SP	1	259.2	1,500	2	6.8	500	2
Casiawan BWSA		SP	1	259.2	2,500	2	16.0	500	7
Esperanza BWSA		SP	1	345.6	5,000	1	8.0	2,500	7
Laggao BWSA		SP	1	259.2	3,000	1	8.0	1,500	6
Libertad BWSA		SP	1	259.2	2,000	1	3.4	1,000	5
Looc BWSA		SP	1	691.2	1,500	1	8.0	1,000	2
Magbagon BWSA		SP	1	115.2	1,500	1	88.0	1,000	2

Table 4.1.2 Details on Existing Level II Systems (Cont'd.)
Sheet 1 of 6

Name of Municipality	Name of Operating Body	Water Source			Existing Facilities					
		Type	Number	Discharge (m ³ /day)	Length of Transmission Line (meter)	Reservoir		Length of Distribution Line (meter)	Number of Public Faucets	
						Volume (m ³)	Number			
Cebuayan	Pawikan BWSA	SP	1	345.6	2,800	1	27.0	1,500	8	
	Salawad BWSA	SP	1	345.6	2,000	1	8.0	1,500	5	
	Talibong BWSA	SP	1	345.6	500	1	3.4	500	6	
	Municipal Total	SP	12	3,830.4	30,800	15	283.3	14,500	71	
	Caibiran	Asug	SP	1	9.6	500	1	10.0		4
		Bari-is	SP	1	10.1	2,000	1	10.0		5
		Binohangan	SP	1	12.0	1,900	1	10.0		5
		Cabibihan	SP	1	9.6	700	1	10.0		5
		Looc, Caibiran	SP			600				4
		Manlabang	SP	1	9.6	60				4
Maurang		SP	1	9.6	1,500	1	10.0		5	
Tomalistas		SP	1	9.6	900	1	10.0		4	
Union		SP	1	9.6	1,200	1	10.0		5	
Uson		SP	1		850	3	24.0		10	
Culaba	Municipal Total	SP	9	79.7	10,210	10	94.0		51	
	Acaban & Salvacion	SP	1	259.2	2,000	2	16.4	600	11	
	Habubab WS	SP	1	172.8	1,700	1	12.7	300	6	
	Looc - BWSA	SP	1	259.2	325	1	5.4	761	10	
	Patag	SP	1	216.0	1,500	1	4.7	250	10	
	San Roque BWS	SP	1	259.2	3,000	1	6.8	500	4	
	Sinio Patag WS	SP	1	172.8	300	1	1.7	280	3	
	Municipal Total	SP	6	1,339.2	8,825	7	47.8	2,691	44	
	Balacson WW	SP			7,000	1	10.0	600	13	
	Buyo WW	SP			1,500	1	8.0	500	10	
Maripipi	Municipal Total	SW	1		8,500	2	18.0	1,100	23	
	Agutay SWA	DgW	1			1	20.0		5	
	Banlas SWA	DgW	1			1	10.0		7	
	Bato SWA	DgW	1			1	10.0		7	

Table 4.1.2 Details on Existing Level II Systems (Cont'd.)

Sheet 1 of 6

Name of Municipality	Name of Operating Body	Water Source			Existing Facilities				
		Type	Number	Discharge (m ³ /day)	Length of Transmission Line (meter)	Reservoir		Length of Distribution Line (meter)	Number of Public Faucets
						Number	Volume (m ³)		
	Binalayan East SWA	DW	1		70	3	20.0	200	7
	Binongto-an SWA	DW	1			1	20.0	200	5
	Burabod SWA	DgW	1			1	10.0		7
	Calbani SWA	DW	1		30	1	20.0	335	4
	Canduhao SWA	DW	1			1	10.0		5
	Danao SWA	DW	1			1	10.0		7
	Ermita SWA	SP	1			1	40.0	1,280	10
	Trabagan SWA	DgW	1			1	10.0		5
	Viga SWA	SP	1			1	20.0		8
	Municipal Total	DgW/DW/SP/SW	4/5/2/1		100	14	200.0	2,015	77
Naval (Capital)	Anislagan	SP	1	64.8		1	5.6		4
	Cabunga-an	SP	1			1	5.6		3
	Capitahan	SP	1			1	5.6		5
	Imelda	SP	1	25.1		1	8.0		8
	Libtong	SP	1	25.1		2	16.0		14
	Lucsoon	SP	1	25.1		2	5.2		5
	Talustusan	SP	1			4	13.6		30
	Villa Caneja	SP	1			2	10.0		6
	Villa Consuelo	SP	1						2
	Municipal Total	SP	9	140.0		14	69.6		77
	Provincial Total		45	5,968.1	111,505	66	594.0	23,271	492

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

Table 4.1.2 Details on Existing Level II Systems
Sheet 2 of 6

Name of Municipality	Name of Operating Body	Number of Barangay Served			Number of Households Served			Number of Population Served		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Almeria	Iyosan BWS		1	1		74	74		445	445
	Jamorawon BWS		1	1		50	50		300	300
	Pulang Bato BWS		1	1		64	64		382	382
	Salangi BWS		1	1		61	61		366	366
	Sampao BWS		1	1		42	42		251	251
	Tabunan BWS		1	1		45	45		267	267
	Municipal Total		6	6		336	336		2,011	2,011
	Bato		1	1		10	10		50	50
	Burabod		1	1		200	200		1,000	1,000
	Busali		1	1		270	270		1,350	1,350
Biliran	Canila		1	1		15	15		75	75
	Hugpa		1	1		25	25		125	125
	Julita		1	1		25	25		125	125
	Pinangumhan		1	1		15	15		75	75
	Sanggalang		1	1		30	30		150	150
	Villa Enage (Baras)		1	1		102	102		551	551
	Municipal Total		9	9		692	692		3,501	3,501
	Balaquid BWSA		1	1		20	20		100	100
	Baso BWSA		1	1		10	10		50	50
	Bunga BWSA	1		1	75	75	375		375	375
Cabugayan	Caanibongan BWSA		1	1		10	10		50	50
	Casiawan BWSA		1	1		35	35		175	175
	Esperanza BWSA	1		1	35	35	210		210	210
	Langgao BWSA		1	1		30	30		150	150
	Libertad BWSA	1		1	25	25	125		125	125
	Looc BWSA		1	1		10	10		50	50
	Municipal Total		4	4		110	110		550	550

Table 4.1.2 Details on Existing Level II Systems (Cont'd.)
Sheet 2 of 6

Name of Municipality	Name of Operating Body	Number of Barangay Served			Number of Households Served			Number of Population Served		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Cebuigan	Magbangan BWSA	1		1	10		10	60		60
	Pawikan BWSA		1	1		40	40		200	200
	Salawad BWSA		1	1		25	25		125	125
	Talibong BWSA		1	1		30	30		150	150
	Municipal Total	4	9	13	145	210	355	770	1,050	1,820
	Asug		1	1		20	20		120	120
Caibiran	Bari-is		1	1		25	25		150	150
	Binohangan		1	1		25	25		150	150
	Cabibihan		1	1		30	30		180	180
	Looc, Caibiran		1	1		23	23		79	79
	Manlabang		1	1		20	20		120	120
	Maurang		1	1		25	25		150	150
	Tomalistas		1	1		20	20		120	120
	Union		1	1		25	25		150	150
	Uson		1	1		50	50		200	200
	Municipal Total		10	10		263	263		1,419	1,419
Culaba	Acaban & Salvacion WS		2	2		72	72		430	430
	Habuhab WS		1	1		30	30		180	180
	Looc - BWSA		1	1		65	65		389	389
	Parag		1	1		60	60		360	360
	Municipal Total		4	4		227	227		1,359	1,359
Culaba	San Roque BWS		1	1		26	26		156	156
	Sitio Patag WS					18	18		108	108
	Municipal Total		6	6		271	271		1,623	1,623
Kawayan	Balacson WW		1	1		65	65		325	325
	Buyo WW		1	1		50	50		250	250
	Municipal Total		2	2		115	115		575	575

Table 4.1.2 Details on Existing Level II Systems (Cont'd.)
Sheet 2 of 6

Name of Municipality	Name of Operating Body	Number of Barangay Served			Number of Households Served			Number of Population Served			
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	
Maripipi	Agutay SWA		1	1		25	25		127	127	
	Banlas SWA		1	1		35	35		178	178	
	Bato SWA		1	1		35	35		178	178	
	Binalayan East SWA		1	1		35	35		178	178	
	Binongto-an SWA	1		1	25		25	122		122	
	Burabod SWA		1	1		35	35		178	178	
	Calbani SWA		1	1		20	20		102	102	
	Canduhao SWA		1	1		25	25		127	127	
	Danao SWA		1	1		35	35		178	178	
	Ermita SWA	1		1	50		50	244		244	
	Trabugan SWA		1	1		25	25		127	127	
	Viga SWA		1	1		40	40		204	204	
	Municipal Total		2	10	12	75	310	385	366	1,578	1,944
	Naval (Capital)	Anislagan		1	1		20	20		95	95
		Cabunga-an		1	1		15	15		71	71
		Capinahan		1	1		25	25		119	119
		Imelda		1	1		40	40		190	190
Libtong			1	1		70	70		332	332	
Lucsoon			1	1		25	25		119	119	
Talustusan			1	1		150	150		711	711	
Villa Caneja			1	1		30	30		142	142	
Villa Consuelo			1	1		10	10		47	47	
Municipal Total			9	9	9	385	385	385	1,825	1,825	
Provincial Total			6	61	67	220	2,582	3,062	1,136	13,582	14,718

Table 4.1.2 Details on Existing Level II Systems

Sheet 3 of 6

Name of Municipality	Name of Operating Body	Service Conditions During Dry Season											
		Supply (Hrs/day)	Dirty Water ¹	Taste or Smell ²	Supply Interruption (number/month)				Supply Water Pressure (% of total)				
					Power Failure	Pump Breakdown	Pipe Burst	Others	Adequate	Inadequate			
Almeria	Iyosan BWS	24											
	Jamorawon BWS	24											
	Pulang Bato BWS	24											
	Salangi BWS	24											
	Sampao BWS	24											
	Tabunan BWS	24											
Buliran	Bato		O	M				1					
	Burabod		O	M				1			50	50	
	Busali	24	O	M				1			50	50	
	Canila		O	M				1					
	Hugpa		O	G/M				1					
	Julita	24	O	M				1					
	Pinangumban		O	G/M				1					
	Sanggalang		O	M				1		1	5	95	
	Villa Enage (Baras)		O	S/M				1					
	Balaquid BWSA	24											
Cabucgayan	Baso BWSA	24											
	Bunga BWSA	8											
	Caambongan BWSA	24											
	Casiawan BWSA	24											
	Esperanza BWSA	12											
	Langgao BWSA	24											
	Libertad BWSA	24											
	Looc BWSA	24											
	Magbangon BWSA	8											

Table 4.1.2 Details on Existing Level II Systems (Cont'd.)

Sheet 3 of 6

Name of Municipality	Name of Operating Body	Service Conditions During Dry Season									
		Supply (Hrs/day)	Dirty Water ¹	Taste or Smell ²	Power Failure	Pump Breakdown	Pipe Burst	Others	Supply Water Pressure (% of total)		
Cabugayan	Pawikan BWSA	24									
	Salawad BWSA	24									
	Talibong BWSA	24									
Caibiran	Asug	24		G							
	Bar-is	24		G							
	Binohangan	24									
	Cabibihan	24		G							
	Looc, Caibiran	24		G							
	Manlabang	24									
	Maurang	24		G							
	Tomalistas	24		G							
	Union			G							
	Uson			G							
Culaba	Acaban & Salvacion WS	24									
	Habuhab WS	24									
	Looc - BWSA	24									
	Patag	24									
	San Roque BWS	24									
Kawayan	Sito Patag WS	24									
	Balacson WW	24									
	Buyo WW	24									
	Agutay SWA										
Maripipi	Banlas SWA										
	Bato SWA										

Table 4.1.2 Details on Existing Level II Systems (Cont'd.)

Sheet 3 of 6

Name of Municipality	Name of Operating Body	Supply (Hrs/day)	Dirty Water ¹	Taste or Smell ²	Service Conditions During Dry Season					Supply Water Pressure (% of total)		
					Supply Interruption (number/month)				Pipe Burst	Others	Adequate	Inadequate
					Power Failure	Pump Breakdown						
Mampipi	Binalayan East SWA	24										
	Binongto-an SWA											
	Burabod SWA											
	Calbani SWA											
	Canduhao SWA											
	Danao SWA											
	Ermita SWA	6										
	Trabugan SWA											
	Viga SWA											
	Anislagan	24	O	G							70	30
	Cabunga-an	18	O	G							60	40
	Capinahan	24	O	G							70	30
	Imelda	24	O	G							70	30
Libtong	24	O	G							70	30	
Lucsoon	24	O	G							60	40	
Talustusan	24	O	G							60	40	
Villa Caneja	24	O	G							50	50	
Villa Consuelo	24	O	G							75	25	

Note: 1. Dirty Water: E - Everyday, OW - Once a week, OM - Once a month, O - Occasional.

2. Taste or Smell: G - Good taste, S - Salty, W - Wood taste, M - Metallic taste, O - Others.

Table 4.1.2 Details on Existing Level II Systems
Sheet 4 of 6

Name of Municipality	Name of Operating Body	Number of Staff					Repair Work		
		Technical Staff	Administrative Staff	Collector	Total Number of Staff	Local Trademan	MEO/CEO	DEO	Others
Almeria	Iyosan BWS					✓			
	Jamorwon BWS					✓			
	Pulang Bato BWS					✓			
	Salangi BWS					✓			
	Sampao BWS					✓			
	Tabunan BWS					✓			
Biliran	Bato								
	Burabod								
	Busali					✓			
	Canila								
	Hugpa								
	Julita								
	Pinangumhan								
	Sanggalang								
	Villa Enage (Baras)								
	Balaquid BWSA								
Cabugayan	Baso BWSA								
	Bunga BWSA								
	Caanibongan BWSA								
	Casiawan BWSA								
	Esperanza BWSA								
	Langgao BWSA								
	Libertad BWSA								
	Loooc BWSA								
	Magbangon BWSA								

Table 4.1.2 Details on Existing Level II Systems (Cont'd.)
Sheet 4 of 6

Name of Municipality	Name of Operating Body	Number of Staff					Repair Work		
		Technical Staff	Administrative Staff	Collector	Total Number of Staff	Local Tradesman	MEO/CEO	DEO	Others
Cabucgayan	Pawikan BWSA								
	Salawad BWSA								
	Talibong BWSA								
	Asug								
	Bari-is								
	Binobangan								
	Cabibihan								
	Looc, Calbiran								
	Manlabang								
	Maurang								
Culaba	Tomahistis								
	Union								
	Uson								
	Acaban & Salvacion WS								
	Habuhab WS								
	Looc - BWSA								
	Patag								
	San Roque BWS								
	Sitio Patag WS								
	Balacson WW								
Kawayan	Buyo WW								
	Agutay SWA							✓	
	Banlas SWA							✓	
Maripipi	Bato SWA							✓	

Table 4.1.2 Details on Existing Level II Systems (Cont'd.)
Sheet 4 of 6

Name of Municipality	Name of Operating Body	Technical Staff	Administrative Staff	Collector	Total Number of Staff	Number of Staff			
						Local Trademan	MEO/CEO	DEO	Others
Maripipi	Binalayan East SWA					✓			
	Binongto-an SWA					✓			
Maripipi	Burabod SWA					✓			
	Calbani SWA					✓			
	Canduhao SWA					✓			
	Danao SWA					✓			
	Ermita SWA	5		1	6	✓			
	Trabugan SWA					✓			
	Viga SWA								
Naval (Capital)	Anislagan								Brgy. Off.
	Cabunga-an								Brgy. Off.
	Capiñahan					✓			
	Imelda		1		1				Brgy. Off.
	Libtong		1		1				Brgy. Off.
	Lucsoon		1		1	✓			
	Talusnasan		1		1				Brgy. Off.
	Villa Caneja								Brgy. Off.
	Villa Consuelo								Brgy. Off.

Table 4.1.2 Details on Existing Level II Systems
Sheet 5 of 6

Name of Municipality	Name of Operating Body	Expenditures (P' 000.00 / year)							Tariff				Average Collection Efficiency (%)		
		Annual	Wages	Fuel, Chem.	Transport	Repairs	Loan Repayment	Other	Consumer Payment (Year)	Cost per Pail	Cost per Cu. (Pesos)	Cost per HH/Mon		Other	
Almerna	Iyosan BWS												5		
	Jamorwon BWS												5		
	Pulang Bato BWS												5		
	Salangit BWS											free			
	Sampao BWS												2		
	Tabunan BWS												5		
Biliran	Bato														
	Burabod														
	Busali														
	Canila														
	Hugpa														
	Julita														
	Pinangumban														
	Sanggalang														
	Villa Enage (Baras)														
	Balaquid BWSA														
Cabugayan	Baso BWSA														
	Bunga BWSA														
	Caanibongan BWSA														
	Casiawan BWSA														
	Esperanza BWSA														
	Langgao BWSA														
	Libertad BWSA														
	Looc BWSA														
	Magbangon BWSA														
	Pawukan BWSA														
	Salawad BWSA														
	Talibong BWSA														
	Asug														
	Barais														
Cairan	Binhangan														
	Cabibhan														
	Looc, Cairan														
	Manlabang														

Table 4.1.2 Details on Existing Level II Systems (Cont'd.)
Sheet 5 of 6

Name of Municipality	Name of Operating Body	Expenditures (P '000.00 / year)						Tariff (Pesos)				Average Collection Efficiency (%)		
		Annual	Wages	Fuel, Chem. Mat'l.	Transport	Repairs	Loan Repayment	Other	Consumer Payment (Year)	Cost per Pail	Cost per Cu. Meter		Cost per HH/Mon	Other
Cebu	Maurang													
	Tomalistas													
	Union													
	Uson													
Culaba	Acaban & Salvacion WS													
	Habuhab WS													
	Looc - BWSA													
	Patag													
	San Roque BWS													
	Sitio Patag WS													
Kawayan	Balacson WW													
	Buyo WW													
	Agutay SWA													
Maripipi	Bimlas SWA													
	Bato SWA													
	Binalayan East SWA										30			
	Binongo-an SWA										45	1/gal.		
	Burabod SWA													
	Calbani SWA													
	Candubao SWA													
	Danao SWA													
	Ermita SWA													
	Trabugan SWA											30		
Naval (Capital)	Viga SWA													
	Anislagan													
	Cabungan-an													
	Capuhahan	17.5		1	0.5	17	3				10	5	100	
	Imelda					20					5	5	1	
	Libtong					3.5					50	4	100	
	Lucsoon	4		0.5		60					5	2	100	
	Talustusan	60												
	Villa Caneja													
	Villa Consuelo			0.5		5								

Table 4.1.2 Details on Existing Level II Systems

Sheet 6 of 6

Name of Municipality	Name of Operating Body	Billings				Revenues					
		Annual Billing (Number)	Public Faucet Consumer	House Connection Consumers	Expected Subsidies	Others	Annual Income (P '000.00 / year)	Payment by Public Faucet Consumers	Payment by House Connection	Subsidies	Other
Almeria	Iyosan BWS										
	Jamorawon BWS										
	Pulang Bato BWS										
	Salangi BWS										
	Sampao BWS										
	Tabunan BWS										
	Bato										
	Burabod										
	Busahi										
	Camila										
Biliran	Hugpa										
	Julita										
	Pinangumhan										
	Sanggalang										
	Villa Enage (Baras)										
	Balaquid BWSA										
	Baso BWSA										
	Bunga BWSA										
	Caanibongan BWSA										
	Casiawan BWSA										
Cabugayan	Esperanza BWSA										
	Langgao BWSA										
	Libertad BWSA										
	Looc BWSA										
	Magbangon BWSA										
	Pawikan BWSA										

Table 4.1.2 Details on Existing Level II Systems (Cont'd.)
Sheet 6 of 6

Name of Municipality	Name of Operating Body	Billings					Revenues					
		Annual Billing (Number)	Public Faucet Consumer	House Connection Consumers	Expected Subsidies	Others	Annual Income	Payment by Public Faucet Consumers	Payment by House Connection Consumer	Subsidies	Other	
Cabugayan	Salwad BWSA											
	Talibong BWSA											
Calibiran	Asug											
	Bari-is											
	Binhangan											
	Cabibihan											
	Looc, Caibiran											
	Manlabang											
	Maurang											
	Tomalistas											
	Union											
	Uson											
	Culaba	Acaban & Salvacion WS										
		Habuhab WS										
Looc - BWSA												
Patag												
San Roque BWS												
Kawayan	Sitio Patag WS											
	Balacson WW											
	Buyo WW											
Maripipi	Agutay SWA											
	Banlas SWA											
	Bato SWA											
	Binalayan East SWA											
	Binongto-an SWA											
Burabod SWA												

Table 4.1.2 Details on Existing Level II Systems (Cont'd.)
Sheet 6 of 6

Name of Municipality	Name of Operating Body	Billings				Revenues					
		Annual Billing (Number)	Public Faucet Consumer	House Connection Consumers	Expected Subsidies	Others	Annual Income (P '000.00 / year)	Payment by Public Faucet Consumers	Payment by House Connection Consumer	Subsidies	Other
Maripipi	Calbani SWA										
	Canduhao SWA										
	Danao SWA										
	Ermita SWA										
	Trabugan SWA										
Naval (Capital)	Viga SWA										
	Anislagan										
	Cabunga-an										
	Capmahan										
	Imelda										
	Libtong	1.5									
	Lucsoon	6							4.85		
	Talustusan										
	Villa Caneja										
	Villa Consuelo										

4.1.5 Level I Facilities

Safe and Unsafe Classification of Level I Facilities

According to the definition of DOH, the protected deep well, protected shallow well, covered/ improved dug well and developed spring are classified as safe sources, while unprotected shallow well, open dug well, undeveloped spring and rain water collector are classified as unsafe sources.

In the 1990 population census data, "Households by Main Source of Drinking Water and City/Municipality", it was shown that 23% of the households depended on shallow well, dug well, undeveloped spring, lake, river and rain water collector, etc. This figure was arrived as the percentage of underserved/unserved sources, if all shallow wells were regarded as doubtful.

On the other hand, the PHO has been conducting water quality analysis of samples collected at public and private Level I wells. However, the results of water quality analysis on existing shallow wells are not available at this study time.

As a reference information, the experiences in 1st and 2nd batch provinces in Mindanao area in the preparation of PW4SP show the unsafe percentage of 20-50% as summarized below.

Surigao del Norte	Agusan del Norte	Agusan del Sur	Bukidnon	Misamis Oriental	Davao Oriental	Davao del Norte	Davao del Sur	Sarangani	South Cotabato
20%	50%	23%	50%	50%	40%	20%	46%	30%	50%

Based on the above study, the rounded percentage of 30% may be adopted as an unsafe percentage to all municipalities both in urban and rural area in the classification of shallow wells. While, those sources other than shallow wells are processed as classified in the questionnaire. Table 4.1.4 (a) presents the numbers of Level I facilities by safe and unsafe classification.

Public and Private Level I Facilities for Rural Water Supply

Table 4.1.4 (b) presents the number and proportion of Level I facilities by public and private sources for rural water supply in the province. Public and private facilities share 55% and 45% of the total number of Level I facility, respectively. Developed springs occupy 33% of the total number of public facilities.

Table 4.1.4 (b) Public and Private Level I Facilities for Rural Water Supply

Facility	Public Source		Private Source		Total
	Number	%	Number	%	
Deep Well	29	100%			29
Shallow Well	25	23%	83	77%	108
Spring Development	44	100%			44
Others	35	57%	26	43%	61
Total	133	55%	109	45%	242

4.1.6 Water Supply Service Coverage

Estimation of Service Coverage in Terms of Safe, Unsafe and Unserved Classification

Through review of the number of water supply systems/facilities and the number of households that were derived from the questionnaire, it was found out that a great number of unserved population would be accounted as a balance between the total population and the population with any levels of services (including unsafe facilities) in application of the service level standard for Level I and II. To come up with more realistic service coverage, the unserved population in 1998 was referred to using the profile in the 1990 population census data, "Households by Main Source of Drinking Water and City/Municipality" prepared by NSO. The rest of the population, those who are not served by Level III and/or II systems, were considered to be covered by shared or own use of Level I facilities. The calculation procedure is as follows:

- Service percentage/population of Level III and Level II systems was estimated based on the questionnaire survey results.
- Percentage of unserved population (using undeveloped spring, lake water, river water, peddler, etc.) of respective municipality by urban and rural area, which were studied in the 1990 population census.
- Population covered by Level I facilities was calculated as the balance between the total population and the population served by Level III & II systems and the unserved population.
- Level I population coverage was estimated with the assumption that 50% of the private facilities were shared by neighbors.

Unserved population and the population covered by Level I facilities are presented in Table 4.1.5. Tables 4.1.6 9 (a) and (b) present the overall population covered by Level I facilities and the number of households.

Table 4.1.5 Estimation of Unserved Population by Municipality

Name of Municipality	Area	Population and Household (1998)		Served Population			Unserved Population			Population Covered by Level I Facilities	
		Number	HH Size	Level III	Level II	Total	Unserved Percentage (1995)		Unserved Population 1998		
							Total No. of HHs	No. of Unserved			%
Almeria	Urban	2,857	5.22	2,567		2,567	492	32	7	290	431
	Rural	11,023	5.08	6,573	2,011	8,584	2,135	389	18	2,008	431
	Total	13,880	5.11	9,140	2,011	11,151	2,627	421	16	2,298	431
Biliran	Urban	4,799	5.59	1,920	330	2,250	805	11	1	66	2,483
	Rural	9,710	5.64		3,501	3,501	1,646	138	8	814	5,395
	Total	14,509	5.62	1,920	3,831	5,751	2,451	149	6	880	7,878
Cebu	Urban	8,972	5.44	1,600	770	2,370	1,290	63	5	438	6,164
	Rural	7,937	5.10	2,000	1,320	3,320	1,857	768	41	3,283	1,334
	Total	16,909	5.24	3,600	2,090	5,690	3,147	831	26	3,721	7,498
Caibiran	Urban	6,053	5.37	3,816	30	3,846	1,081	65	6	2,207	
	Rural	12,851	5.33	324	1,611	1,935	2,399	797	33	4,269	6,647
	Total	18,904	5.34	4,140	1,641	5,781	3,480	862	25	6,476	6,647
Culaba	Urban	4,447	6.08	2,128		2,128	663	24	4	2,319	
	Rural	9,198	5.95	1,874	1,981	3,855	1,456	298	20	1,883	3,460
	Total	13,645	5.99	4,002	1,981	5,983	2,119	322	15	4,202	3,460
Kawayan	Urban	1,844	4.75	1,033	725	1,758	386	11	3	87	
	Rural	15,027	4.84	3,023	6,525	9,548	3,016	139	5	693	4,786
	Total	16,871	4.83	4,056	7,250	11,306	3,402	150	4	779	4,786
Maripipi	Urban	1,434	4.88		366	366	294	17	6	83	985
	Rural	6,717	5.09		1,578	1,578	1,260	209	17	1,114	4,025
	Total	8,151	5.05		1,944	1,944	1,554	226	15	1,197	5,010
Naval (Capital)	Urban	10,559	4.94	9,630		9,630	1,926	76	4	929	
	Rural	23,423	4.74	3,850	1,825	5,675	4,940	931	19	4,414	13,334
	Total	33,982	4.80	13,480	1,825	15,305	6,866	1,007	15	5,343	13,334
Provincial Total	Urban	40,965	5.29	22,694	2,221	24,915	6,937	299	4	6,418	9,632
	Rural	95,886	5.10	17,644	20,352	37,996	18,709	3,669	20	18,478	39,412
	Total	136,851	5.16	40,338	22,573	62,910	25,646	3,968	15	24,896	49,045

Table 4.1.6 (a) Estimation of Population Covered by Safe and Unsafe Source by Municipality

Name of Municipality	Area	Pop. Covered by Level I Facilities	Number of Facilities						Coverage of Own Use								
			Public Facilities			Private Facilities			Number of Private Facilities			(1) Population Covered					
			Safe	Unsafe	Total	Safe	Unsafe	Total	Safe	Unsafe	Total	Safe	Unsafe	Total			
Almeria	Urban																
	Rural		12	3	15												
	Total	431	12	3	15												
Biliran	Urban		2		2												
	Rural		9		9												
	Total	5,395	11		11												
Cebu	Urban		13	4	17	32	52	84	16	26	42	88	141	228			
	Rural		18	1	19	7	14	21	4	7	11	19	38	57			
	Total	1,334	31	5	36	39	66	105	20	33	53	107	179	286			
Calbiran	Urban																
	Rural		4		4												
	Total	6,647	4		4												
Culaba	Urban																
	Rural		1	1	2												
	Total	3,460	1	1	2												
Kawayan	Urban																
	Rural		14	2	15	1	1	2	1	1	2	3	5				
	Total	4,786	14	2	15	1	1	2	1	1	2	3	5				
Maripipi	Urban		9	2	11												
	Rural		34	1	35	39	29	67	19	14	34	94	70	163			
	Total	5,010	43	3	46	39	29	67	19	14	34	94	70	163			
Naval (Capital)	Urban																
	Rural		21	13	34	13	6	19	7	3	10	33	14	47			
	Total	13,334	21	13	34	13	6	19	7	3	10	33	14	47			
Provincial Total	Urban		24	7	30	32	52	84	16	26	42	88	141	228			
	Rural		114	20	133	60	49	109	30	24	55	149	123	272			
	Total	49,045	137	26	163	92	101	193	46	50	97	236	264	501			

Table 4.1.6 (b) Estimation of Population Covered by Safe and Unsafe Source by Municipality

Name of Municipality	Area	Coverage of Shared Well										Level I Coverage (1) + (2)								
		(2) Population Covered by Private and Public			Number of Households			No. of HHs per Shared Facility	Safe		Unsafe		Total							
		Safe	Unsafe	Total	Safe	Unsafe	Total		Pop.	%	Pop.	%	Pop.	%						
Almeria	Urban																			
	Rural	344	86	431	68	17	85	6	344	3	86	1	431	4						
	Total	344	86	431	68	17	85	6	344	2	86	1	431	3						
Biliran	Urban																			
	Rural	2,483		2,483	444		444	222	2,483	52			2,483	52						
	Total	2,483		2,483	444		444	222	2,483	52			2,483	52						
Cebuogayan	Urban																			
	Rural	5,395		5,395	957		957	106	5,395	56			5,395	56						
	Total	5,395		5,395	957		957	106	5,395	56			5,395	56						
Cebuogayan	Urban																			
	Rural	7,878		7,878	1,401		1,401	127	7,878	54			7,878	54						
	Total	7,878		7,878	1,401		1,401	127	7,878	54			7,878	54						
Culaba	Urban																			
	Rural	3,019		3,019	555		555	18	3,019	35			3,019	35						
	Total	3,019		3,019	555		555	18	3,019	35			3,019	35						
Culaba	Urban																			
	Rural	977		977	192		192	8	977	13			977	13						
	Total	977		977	192		192	8	977	13			977	13						
Culaba	Urban																			
	Rural	3,996		3,996	747		747	15	3,996	24			3,996	24						
	Total	3,996		3,996	747		747	15	3,996	24			3,996	24						
Culaba	Urban																			
	Rural	6,647		6,647	1,247		1,247	312	6,647	52			6,647	52						
	Total	6,647		6,647	1,247		1,247	312	6,647	52			6,647	52						
Culaba	Urban																			
	Rural	2,422		2,422	407		407	291	2,422	26			2,422	26						
	Total	2,422		2,422	407		407	291	2,422	26			2,422	26						
Kawayan	Urban																			
	Rural	4,248		4,248	878		878	62	4,248	28			4,248	28						
	Total	4,248		4,248	878		878	62	4,248	28			4,248	28						
Maripipi	Urban																			
	Rural	779		779	160		160	18	779	54			779	54						
	Total	779		779	160		160	18	779	54			779	54						
Maripipi	Urban																			
	Rural	3,152		3,152	619		619	11	3,152	48			3,152	48						
	Total	3,152		3,152	619		619	11	3,152	48			3,152	48						
Naval (Capital)	Urban																			
	Rural	3,931		3,931	779		779	12	3,931	49			3,931	49						
	Total	3,931		3,931	779		779	12	3,931	49			3,931	49						
Naval (Capital)	Urban																			
	Rural	8,491		8,491	1,791		1,791	64	8,491	36			8,491	36						
	Total	8,491		8,491	1,791		1,791	64	8,491	36			8,491	36						
Provincial Total	Urban																			
	Rural	6,282		6,282	1,159		1,159	24	6,282	16			6,282	16						
	Total	6,282		6,282	1,159		1,159	24	6,282	16			6,282	16						
Provincial Total	Urban																			
	Rural	31,676		31,676	6,158		6,158	41	31,676	53			31,676	53						
	Total	31,676		31,676	6,158		6,158	41	31,676	53			31,676	53						
Provincial Total	Urban																			
	Rural	37,958		37,958	7,317		7,317	36	37,958	28			37,958	28						
	Total	37,958		37,958	7,317		7,317	36	37,958	28			37,958	28						

The number of households per shared public/private facility is estimated at 24 households in urban area and 41 in rural area as provincial averages. Compared with the service level standard of Level I public facility (15 households/facility), these figures are considered within common range. However, those figures in the municipalities of Biliran, Caibiran and Culaba, are considered quite large. This reason seems to arise from a considerable number of non-reported/unidentified private wells.

Percentage of Population Covered by Level I Public Facility for Rural Water Supply

Grasping the current percentage of population covered by public facilities would be a useful information in considering to what extent the additional population to be covered by public facilities in the future plan. This takes into account that the major facilities would be Level I especially for rural water supply in the future.

Population served by public facilities is calculated using Tables 4.1.6 (a) and 4.1.6 (b) as a balance between the total population served by Level I facilities and the population covered by private facilities. Thus, it is estimated that 30,900 persons or 97% of the population served by Level I facilities are covered by public facilities.