

JAPAN INTERNATIONAL COOPERATION AGENCY

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

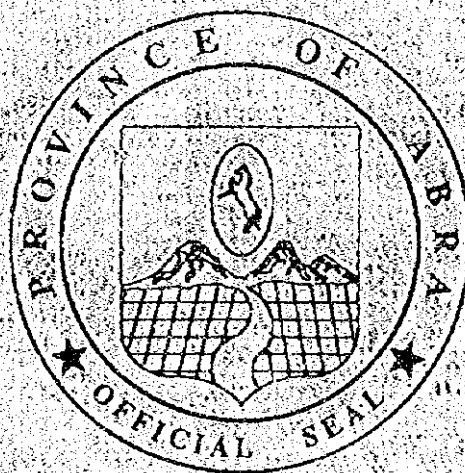
STUDY ON THE  
PROVINCIAL WATER SUPPLY, SEWERAGE AND  
SANITATION SECTOR PLAN  
IN  
THE REPUBLIC OF THE PHILIPPINES

VOLUME III - 5

SUPPORTING AND DATA REPORT

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

ABRA



FEBRUARY 1996

NIPPON JOGESUIDO SEKKEI CO., LTD.

EXCHANGE RATE (As of 1 August 1995)

US \$ 1.0 = Peso 25.7 = Yen 88.3

**JAPAN INTERNATIONAL COOPERATION AGENCY**

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

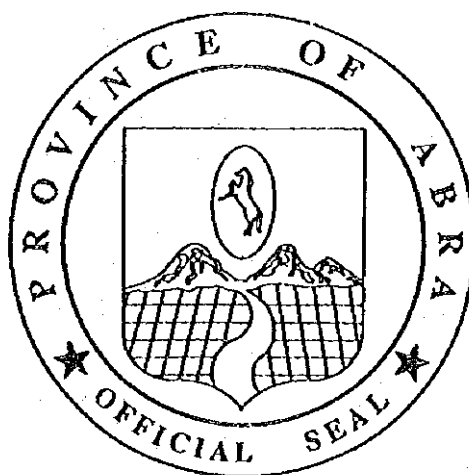
**STUDY ON THE  
PROVINCIAL WATER SUPPLY, SEWERAGE AND  
SANITATION SECTOR PLAN  
IN  
THE REPUBLIC OF THE PHILIPPINES**

**VOLUME III - 5**

**SUPPORTING AND DATA REPORT**

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

**ABRA**



**FEBRUARY 1996**

**NIPPON JOGESUIDO SEKKEI CO., LTD.**





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

**VOLUME III - 5 SUPPORTING AND DATA REPORT**

**TABLE OF CONTENTS**

<b>CHAPTER</b>	<b>PAGE NO.</b>
<b>LIST OF TABLES</b>	iv
<b>LIST OF FIGURES</b>	vii
<b>SUPPORTING REPORT</b>	
<b>A. BACKGROUND INFORMATION AND EXISTING CONDITIONS</b>	
<b>1. INTRODUCTION</b>	
1.3 The Provincial Plan for the Province of Abra	1 - 1
1.3.1 Preparation of the Plan	1 - 1
<b>2. PLANNING APPROACH FOR FUTURE SECTOR DEVELOPMENT</b>	
2.6 Planning Principles and Data Management	2 - 1
2.6.2 Data Management	2 - 1
<b>3. PROVINCIAL PROFILE</b>	
3.3 Socio-economic Conditions	3 - 1
3.3.1 Economic Activities and Household Income	3 - 1
3.3.3 Education	3 - 3
3.4 Population	3 - 4
3.4.2 Classification of Urban and Rural Areas	3 - 4
3.5 Health Status	3 - 5
3.5.3 Health Facilities and Practitioners	3 - 5
3.6 Environmental Conditions	3 - 6
3.6.2 Water Pollution	3 - 6
<b>4. EXISTING FACILITIES AND SERVICE COVERAGE</b>	
4.1 Water Supply	4 - 1
4.1.3 Level III Systems	4 - 1
4.1.4 Level II Systems	4 - 5
4.1.5 Level I Facilities	4 - 29
4.1.6 Water Supply Service Coverage	4 - 29
4.2 Sanitation and Sewerage	4 - 42
4.2.2 Types of Facilities and Definition of Service Level Standard	4 - 42
4.2.3 Sanitation Facilities and Service Coverage	4 - 44

CHAPTER	PAGE NO.
<b>5. EXISTING SECTOR ARRANGEMENTS AND INSTITUTIONAL CAPACITY</b>	
5.5 Sector Agencies at the Local Level	5 - 1
<b>6. PAST FINANCIAL PERFORMANCE IN WATER SUPPLY AND SANITATION</b>	
6.2 Past Public Investment	6 - 1
<b>7. WATER SOURCE DEVELOPMENT</b>	
7.3 Groundwater Sources	7 - 1
7.3.2 Groundwater Availability in the Province	7 - 1
7.4 Spring Sources	7 - 6
7.5 Surface Water Sources	7 - 6
7.6 Future Development Potential of Water Sources	7 - 9
<b>B. FUTURE REQUIREMENTS AND DEVELOPMENT PLAN</b>	
<b>8. FUTURE REQUIREMENTS IN WATER SUPPLY AND SANITATION IMPROVEMENT</b>	
8.2 Targets of Provincial Sector Plan	8 - 1
8.3 Projection of Frame Values	8 - 14
8.3.1 Review of Past Population Development and Population Projection	8 - 14
8.3.2 School Enrollment Projection	8 - 19
8.3.3 Projection of the Number of Public Utilities	8 - 20
8.4 Types of Facilities and Implementation Criteria	8 - 22
8.4.1 Water Supply	8 - 22
8.4.3 Urban Sewerage	8 - 23
8.5 Service Coverage by Target Year	8 - 24
8.5.1 Water Supply	8 - 24
8.5.2 Sanitation	8 - 32
8.6 Facilities, Equipment and Rehabilitation Required to Meet the Target Services	8 - 41
8.6.1 Water Supply	8 - 41
8.6.2 Sanitation	8 - 49
<b>9. SECTOR MANAGEMENT PLAN</b>	
9.4 Project Management Arrangements	9 - 1
9.5 Community Development Model	9 - 20
<b>10. COST ESTIMATES FOR FUTURE SECTOR DEVELOPMENT</b>	
10.2 Assumptions for Cost Estimates	10 - 1
10.2.1 Unit Construction Cost	10 - 1
10.2.2 Unit Cost of Equipment	10 - 26
10.3 Cost of Required Facilities and Equipment	10 - 28
10.3.1 Cost of Required Facilities	10 - 28
10.4 Costs of Sector Management	10 - 32
10.4.1 Breakdown of Community Development and Training Cost	10 - 32

**C. SECTOR IMPLEMENTATION ARRANGEMENTS****11. FINANCIAL ARRANGEMENTS**

11.3 Additional Funding Requirements	11 - 1
11.4 Medium-Term Implementation Arrangements	11 - 2
11.4.2 Alternative Countermeasures	11 - 2

**12. MONITORING**

12.4 Evaluation of Plan Implementation and Updating the PW4SP	12 - 1
---	--------

**DATA REPORT****1. INTRODUCTION**

1.3 The Provincial Plan for the Province of Abra	1 - 1
1.3.2 Outline of the Report	1 - 1
1.4 Acknowledgments	1 - 3

**2. PLANNING APPROACH FOR FUTURE SECTOR DEVELOPMENT**

2.6 Planning Principles and Data Management	2 - 1
2.6.1 Planning Principles	2 - 1
2.6.2 Data Management	2 - 29
2.6.2.1 Questionnaire Forms	2 - 29
2.6.2.2 Definition of Terms	2 - 94
2.6.2.3 User's Guide for Computer-Aided Planning	2 - 102

**3. PROVINCIAL PROFILE**

3.2 Natural Conditions and Geographical Features	3 - 1
3.2.3 Topography and Drainage	3 - 1
3.3 Socio-economic Conditions	3 - 4
3.3.2 Basic Infrastructure	3 - 4
3.5 Health Status	3 - 5
3.5.1 Morbidity, Mortality and Infant Mortality	3 - 5
3.5.3 Health Facilities and Practitioners	3 - 6
3.6 Environmental Conditions	3 - 7
3.6.3 Solid Waste Disposal	3 - 7

**4. EXISTING FACILITIES AND SERVICE COVERAGE**

4.2 Sanitation and Sewerage	4 - 1
4.2.3 Sanitation Facilities and Service Coverage	4 - 1

**7. WATER SOURCE DEVELOPMENT**

7.1 General	7 - 1
7.3 Groundwater Sources	7 - 16
7.3.2 Groundwater Availability in the Province	7 - 16
7.5 Surface Water Sources	7 - 21
7.6 Future Development Potential of Water Sources	7 - 23

# PROVINCIAL WATER SUPPLY, SEWERAGE AND SANITATION SECTOR PLAN

## LIST OF TABLES

Table No.	Title	Page No.
<b>SUPPORTING REPORT</b>		
2.6.1	Key Parameter	2 - 2
2.6.2	Composition of Well Sources and Specific Capacity	2 - 3
2.6.3	Annual Distribution of Investment Cost Required by Sub-sector for Medium-term Development Plan	2 - 4
2.6.4	Level I Safe & Unsafe Percentage	2 - 4
2.6.5	Unit Construction Cost of Different Facilities	2 - 5
2.6.6	Scoring Factor for Municipal Investment Ranking for Urban Water Supply	2 - 6
2.6.7	Scoring Factor for Municipal Comprehensive Investment Ranking	2 - 6
3.3.1	Distribution of Household by Income Class	3 - 1
3.3.2	Gainful Workers by Occupation Group and Major Industry Group	3 - 2
3.3.3	Household Population by Highest Educational Attainment	3 - 3
3.5.1	Number and Ratio to Population of Health Facilities and/or Medical Practitioners	3 - 5
3.6.1	DENR Water Quality Criteria/Water Usage and Classification for Fresh Water	3 - 6
4.1.1	Details on Existing Level III Systems	4 - 1
4.1.2	Existing Level II Systems	4 - 5
4.1.3	Number of Level I Facilities by Safe and Unsafe Classification	4 - 30
4.1.4	Estimation of Unserved Population by Municipality	4 - 33
4.1.5	Estimation of Population Covered by Safe and Unsafe Source by Municipality	4 - 36
4.2.1	Sanitation Facilities and Service Coverage of Household Toilets by Type, by Municipality, Urban and Rural, 1995	4 - 44
6.2.1	Past Internal Revenue Allotment to Municipalities in Abra Province in 1990-1994	6 - 1
7.4.1	Existing Spring Sources	7 - 6
7.5.1	River Information and Related Data	7 - 7
7.5.2	Water Quality Analysis Results	7 - 9
7.6.1	Well Sources Information	7 - 10
7.6.2	Hydrogeological Description by Municipality	7 - 12
7.6.3	Standard Specification of Wells by Municipality	7 - 15
8.2.1	Estimation of Base Year Service Coverage of Water Supply	8 - 1
8.2.2	Population Coverage in Phase I Provided by Served Population in the Base Year (Water Supply)	8 - 3
8.2.3	Number of Households Served by Sanitary Toilets in the Base Year (1995)	8 - 5



Table No.	Title	Page No.
8.2.4	Number of Public School Students Served by School Toilets in the Base Year (1995)	8 - 7
8.2.5	Number of Public Utilities with Sanitary Toilets in the Base Year (1995)	8 - 8
8.2.6	Households Coverage in Phase I Provided by Existing Facilities in the Base Year (Household Toilets)	8 - 11
8.2.7	Public School Students and Public Utilities Coverage in Phase I Provided by Existing Facilities in the Base Year	8 - 13
8.3.1	Past Population Development	8 - 14
8.3.2	Population Distribution in Urban and Rural Areas	8 - 15
8.3.3	Growth Rates and Population Projection for Target Years: Region and Province	8 - 17
8.3.4	Provincial Population for Target Years	8 - 17
8.3.5	Projected Number of Households by Urban and Rural Area by Municipality by Target Year	8 - 18
8.3.6	Projected School Enrollment by Municipality by Target Year	8 - 19
8.3.7	Projected Number of Public Utilities by Municipality by Target Year	8 - 20
8.5.1	Population to be Served by Level II System in Phase I	8 - 24
8.5.2	Population to be Served in Phase I (Water Supply)	8 - 26
8.5.3	Population to be Served in Phase II (Water Supply)	8 - 29
8.5.4	Additional Number of Households to be Served in Phase I (Household Toilets)	8 - 32
8.5.5	Additional Number of Households to be Served in Phase II (Household Toilets)	8 - 35
8.5.6	Additional Number of Public School Students to be Served in Phases I and II (School Toilets)	8 - 38
8.5.7	Number of Public Utilities with Sanitary Toilets in Phases I and II	8 - 39
8.6.1	Urban Water Supply Facilities Required by Target Year	8 - 42
8.6.2	Plan for Expansion of Existing Level III System	8 - 46
8.6.3	Rural Water Supply Facilities Required by Target Year	8 - 47
8.6.4	Urban Household Toilets Required by Target Year	8 - 49
8.6.5	Rural Household Toilets Required by Target Year	8 - 50
8.6.6	Public School Toilets Required by Target Year	8 - 51
8.6.7	Public Toilets Required by Target Year	8 - 52
9.4.1	Format for Level I Project Data	9 - 1
9.4.2	Format for Level II Feasibility Study	9 - 2
10.2.1	Unit Cost of Level I (Deep Well - 30m Depth)	10 - 1
10.2.2	Unit Cost of Level I (Deep Well - 50m Depth)	10 - 2
10.2.3	Unit Cost of Level I (Deep Well - 70m Depth)	10 - 3
10.2.4	Unit Cost of Level I (Deep Well Rehabilitation)	10 - 4
10.2.5	Unit Cost of Level I (Shallow Well - 18m Depth)	10 - 5
10.2.6	Unit Cost of Level I (Spring Development - 90 Service Population)	10 - 6
10.2.7	Unit Cost of Level II (600 Service Population)	10 - 7
10.2.8	Unit Cost of Level III (5,000 Service Population)	10 - 9
10.2.9	Unit Cost of Level III (10,000 Service Population)	10 - 10
10.2.10	Unit Cost of Level III (15,000 Service Population)	10 - 11
10.2.11	Unit Cost of Flush Water Sealed with Septic Tank Toilet	10 - 12
10.2.12	Unit Cost of Pour Flush with Double Pit Latrine	10 - 14

Table No.	Title	Page No.
10.2.13	Unit Cost of Ventilated Improved Pit Latrine (VIP)	10 - 15
10.2.14	Unit Cost of School Toilet	10 - 16
10.2.15	Unit Cost of Public Toilet	10 - 21
10.3.1	Construction Cost of Water Supply Facilities Required for Phase I (2000)	10 - 28
10.3.2	Construction Cost of Water Supply Facilities Required for Phase II (2010)	10 - 29
10.3.3	Costs of Sanitation Facilities Required for Phase I (2000)	10 - 30
10.3.4	Costs of Sanitation Facilities Required for Phase II (2010)	10 - 31
10.4.1	Breakdown of Community Development and Training Cost	10 - 32
11.3.1	Percentages for Annual Investment	11 - 1
11.4.1	Comprehensive Investment Need Ranking of the Municipalities	11 - 5
12.4.1	Draft Formats for Annual Sector Performance Summary Report (Provincial and Municipal Levels)	12 - 1

## **DATA REPORT**

1.3.1	List of Report/Data/Information/Materials Collected	1 - 1
1.4.1	List of Persons and Institutions Who Participated in the Preparation of PW4SP	1 - 3
2.6.1	Guideline for Preparation of PW4SP (Composition of Figures and Tables by Chapter/Section)	2 - 1
2.6.2	Data File Linkages	2 - 129
3.2.1	Flow Data of Major Rivers	3 - 1
3.3.1	Number of Elementary School, High School and Other Served Facilities	3 - 4
3.5.1	Morbidity, Mortality and Infant Mortality by Municipality (Annual Incidence per 100,000 persons)	3 - 5
3.5.2	Number of Health Facilities and Practitioners by Municipality	3 - 6
3.6.1	Municipal Solid Waste Collection and Disposal by Municipality	3 - 7
7.1.1	Water Source Information	7 - 1
7.3.1	Major References	7 - 16
7.3.2	Well Inventory by Municipality	7 - 17
7.5.1	Water Quality Examination Results	7 - 21

# PROVINCIAL WATER SUPPLY, SEWERAGE AND SANITATION SECTOR PLAN

## LIST OF FIGURES

Figure No.	Title	Page No.
<b><i>SUPPORTING REPORT</i></b>		
1.3.1	Organization Chart for Implementation of PW4SP	1 - 13
3.4.1	Distribution of Urban and Rural Areas	3 - 4
4.2.1	Standard Structure of Private Toilet Facility	4 - 42
4.2.2	Standard Structure of School Toilet Facility	4 - 43
5.5.1	Organizational Chart (Provincial Planning and Development Office, Province of Abra)	5 - 1
5.5.2	Organizational Chart (Provincial Engineer's Office, Province of Abra)	5 - 2
5.5.3	Organizational Chart (Provincial Health Office, Province of Abra)	5 - 3
7.3.1	Work Flow of Groundwater Availability Map	7 - 2
7.3.2	Groundwater Potential Area in the Province	7 - 3
7.3.3	Potential Areas of High Yielding & With Salt Intrusion Problem	7 - 5
7.3.4	Area Category by Groundwater Utilization	7 - 4
7.5.1	Study River Basin and Water Sampling Points	7 - 8
8.4.1	Standard Structure of Level I Wells	8 - 22
8.4.2	Staged Improvement in Sewage Collection Method	8 - 23
<b><i>DATA REPORT</i></b>		
7.6.1	Individual Well Location and Specifications Map	7 - 23

## **SUPPORTING REPORT**

**A. BACKGROUND INFORMATION AND  
EXISTING CONDITIONS**




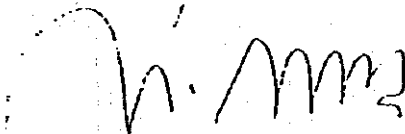
- 1. INTRODUCTION
- 1.3 The Provincial Plan for the Province of Abra
- 1.3.1 Preparation of the Plan

MINUTES OF DISCUSSIONS  
ON  
THE INCEPTION REPORT  
FOR  
STUDY ON PROVINCIAL WATER SUPPLY, SEWERAGE AND  
SANITATION SECTOR PLAN  
IN  
THE REPUBLIC OF THE PHILIPPINES

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

MANILA, SEPTEMBER 5, 1994

  
HON. YOLANDA MA. L. DE LEON  
Assistant Secretary  
Dept. of the Interior and Local Government

  
MR. MASATOSHI MOMOSE  
Team Leader, Study Team  
Japan Int'l 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 August 31, 1994 to conduct "the Study on Provincial Water Supply, Sewerage and Sanitation Sector Plan" (hereinafter referred to as "the Study") in accordance with the Implementing Arrangement for the Study between the JICA and the Department of the Interior and Local Government (hereinafter referred to as "DILG") on November 19, 1993.

A series of discussions was made on the Inception Report for the Study between the Study Team and officials of DILG. In the course of discussions, both parties have agreed to the main items described in the Inception Report. The list of attendants in the series of discussions is presented in Appendix A.

## 1. Objectives and Scope of Work for the Study

- (1) Formulation of long-term provincial development plan for water supply, sewerage and sanitation sector to the year 2010 through technical assistance to the provincial staff; and
- (2) Preparation of medium-term (five year) sector investment plan based on the long-term development plan.

The Study will be conducted in two stages for the two batches.

## 2. Study Area

The study area covers the following nine (9) provinces and are grouped as follows:

### BATCH No. 1

- (1) Zambales
- (2) Rizal
- (3) Mindoro Oriental
- (4) Mindoro Occidental

### BATCH No. 2

- (1) Abra
- (2) Ilocos Norte
- (3) Ilocos Sur
- (4) Nueva Vizcaya
- (5) Batanes

For Rizal province, four (4) municipalities covered by the MWSS will be excluded in the future plan. The conduct of the Study for Batch No. 2 shall be finally determined after ascertaining the peace and order conditions in the subject provinces by the end of the Batch No. 1 Study.



### 3. General Approach and Methodology to the Study

#### (1) Planning framework for future sector development

- a. Base years shall be determined after discussion with NEDA to conform with national plans and programs.
- b. The PW4SP shall be prepared within the context of existing plans and projects. However some modifications may be made where appropriate to reflect the updated information.
- c. Conformity and consistency of the Study with the national plans and programs such as the NEDA Board Resolutions Nos. 4 and 5 - Series 1994; the Water Sector Reforms Study and the National Urban Sewerage and Sanitation Strategy Plan for the Philippines.

#### (2) Establishment of data base

To maintain consistency and compatibility with the existing data base of previously developed PW4SPs, the Study will adopt the same in principle and will be modified if needed.

#### (3) Water source development

Water Availability Maps will be developed through update of the NWRB's Rapid Assessment Report and other studies.

#### (4) Community development and training

Training needs assessment will be undertaken to guide the Study in identifying manpower development strategies and programs. Existing local training resources and activities will be evaluated. A community development study will be undertaken entailing model studies for each of the three service levels in every province.

#### (5) Technology Transfer

Capacity building and technology transfer are important elements of the Study. To the extent possible, counterpart staff at the local and national levels shall participate actively in data collection and analysis, formulation of strategic recommendations, and the preparation of the PW4SP.

#### 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 such as PCC (FW4SP) and the like.

The JICA 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.



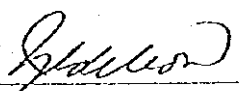
## LIST OF ATTENDANTS IN THE SERIES OF DISCUSSIONS

<u>ATTENDANTS</u>	<u>DESIGNATION</u>
<b>A. DILG</b>	
1. HON. YOLANDA MA. L. DE LEON	Assistant Secretary, Plans and Programs
2. MR. ORVILLE M. ROQUE	Project Manager I, PMO
3. MR. ROGELIO B. OCAMPO	Chief, Planning Div., PMO
4. MS. ELLEN I. PASCUA	Chief, Admin. Div., PMO
5. MS. FE CRISILLA M. BANLUTA	PW4SP Overall Coordinator, PMO
<b>B. OTHER AGENCIES</b>	
1. MR. ANTONIO DE VERA	Administrator, LWUA
2. MR. ROGELIO A. FLORES	Director, PMO-RWS, DPWH
3. DR. MARIO VILLAYERDE	Director, EHS, DOH
<b>C. JICA</b>	
1. MR. MASAO TATEBA	Supervisor, Second Dev't. Study Div., Social Dev't. Study Dept.
2. MR. EIJI IWASAKI	Asst. Resident Representative, Phil. Office
<b>D. JICA STUDY TEAM</b>	
1. MR. MASATOSHI MOMOSE	Team Leader
2. MR. MASUOMI HIROYAMA	Water Supply Engr.
3. MR. KENSUKE ICHIKAWA	Hydrogeologist
4. MS. YOLANDA M. MINGOA	Sanitary Engr.
5. MR. WILFRIDO C. BARREIRO	Institutional/CD/T Specialist
6. MR. ALLEN M. LOWE	System Engr.
7. KENJI KASAMATU	Coordinator

MINUTES OF DISCUSSIONS  
ON  
THE PROGRESS REPORT I  
FOR  
STUDY ON PROVINCIAL WATER SUPPLY, SEWERAGE AND  
SANITATION SECTOR PLAN  
IN  
THE REPUBLIC OF THE PHILIPPINES

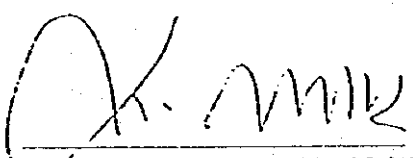

AGREED UPON BETWEEN  
THE DEPARTMENT OF THE INTERIOR AND  
LOCAL GOVERNMENT  
AND  
STUDY TEAM OF  
JAPAN INTERNATIONAL COOPERATION AGENCY

MANILA, DECEMBER 20, 1994

---

HON. YOLANDA MA. L. DE LEON  
Assistant Secretary  
Dept. of the Interior and Local Government

---

MR. MASATOSHI MOMOSE  
Team Leader, Study Team  
Japan Int'l. Cooperation Agency

The Stage I field work for "the Study on Provincial Water Supply, Sewerage and Sanitation Sector Plan" (hereinafter referred to as "the Study") started on August 31, 1994 and completed on December 28, 1994.

A series of discussions was held, through the course of the Study, between JICA Study Team and officials concerned including DILG, NEDA, DPWH, LWUA, other central agencies and provinces. General approach and methodologies, as presented in the Inception Report, have been employed for the planning work.

Progress Report I, which covers all outputs during the work period, was prepared entailing part of PW4SP for respective provinces. The contents of the report were basically agreed upon on December 20, 1994 between JICA Study Team and officials concerned in the Philippine side. The list of attendees to the meeting is presented in Appendix A. The following were confirmed and/or agreed upon by both parties.

1. Study Area Coverage

For Rizal province, four (4) municipalities covered by the MWSS were initially agreed to be excluded from the sector plan. However, inclusion of the Talim Island, part of Binangonan (rural area) which is one of the four municipalities, has been reconsidered upon request by the Governor.

2. Planning Conditions

- (1) Table of Contents for PW4SP: referring to previous PW4SPs, some modifications were made.

- (2) Planning Conditions:

- a. Conformity and consistency of the Study shall be ensured especially with "Medium-Term Philippine Development Plan 1993-1998."
    - b. Planning base year is 1994, while target years are 2000 and 2010 for medium-term and long-term purposes, respectively. The start year of 5-year medium-term development is set to be 1996.

- c. Population projection: NSO projection was basically adopted. However, some modifications on urban and rural population by municipality were made with reference to re-classification of barangays reviewed by respective PSPTs.
- d. Data management: outputs in tables and graphics are prepared in EXCEL spreadsheets for final analysis and presentation.
- e. Sector arrangements and institutional capacity: previous arrangements adopted and experiences learned by the central government agencies are discussed in detail for reference/basis of LGUs in coming up with sector plan.

(3) Future Arrangements by DILG

- a. Further arrangements with PSPTs will be done by DILG to catch up with the schedule to complete PW4SP within one month during February, 1995 after holding workshop at respective provinces.
- b. Arrangements with Batch No. 2 provinces will be initiated based on the experience in Batch No. 1 study, ascertaining the peace and order in the provinces.
- c. To ensure timely completion/finalization of the Plans, DILG shall work closely with the LGUs and other agencies in getting the comments and recommendations on the Draft Plans.
- d. Adoption of the Plans by the Provincial Council (Sangguniang Panlalawigan) shall also be facilitated by DILG.

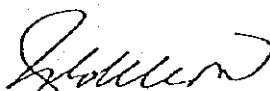
LIST OF ATTENDANTS

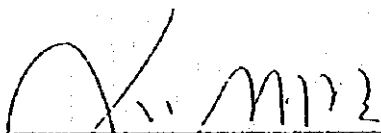
<u>Attendants</u>	<u>Designation</u>
<b>A. DILG</b>	
1. MR. ORVILLE M. ROQUE	Project Manager, PMO
2. MR. ROGELIO B. OCAMPO	Chief, Planning Div., PMO
3. MS. ELLEN I. PASCUA	Chief, Admin. Div., PMO
4. MR. MARIO VERGEL DE DIOS	Chief, Operations Div., PMO
5. MS. FE CRISILLA M. BANLUTA	PW4SP Overall Coordinator, PMO
6. MS. JOSEPHINE RAMOS	DILG Coordinator, Oriental Mindoro
7. MS. LINA GRIEGO	DILG Coordinator, Occidental Mindoro
8. MS. MA. CONTESSA NAVARRO	DILG Coordinator, Rizal
9. MS. VIVIAN BIALA	DILG Coordinator, Zambales
<b>B. OTHER AGENCIES</b>	
1. MR. ROGELIO FLORES	Director, PMO-RWS, DPWH
2. MR. VIRGILIO CACUSANA	Chief, Planning Division, PMO, DPWH
3. MR. VICTOR SABANDEJA	Chief, Environmental Health Division, DOH
4. MR. ANIANO FORNELOS JR.	Sanitary Engineer II, DOH
<b>C. JICA</b>	
1. MR. EIJIE IWASAKI	Asst. Resident Representative, Philippine Office
<b>D. JICA Study Team</b>	
1. MR. MASATOSHI MOMOSE	Team Leader
2. MR. MASUOMI HIROYAMA	Water Supply Engineer
3. MS. YOLANDA M. MINGOA	Sanitary Engineer
4. MR. WILFRIDO C. BARREIRO	Institutional/CD/T Specialist
5. MR. ALLEN LOWE	System Engineer

MINUTES OF DISCUSSIONS  
ON  
THE PROGRESS REPORT II  
FOR  
STUDY ON PROVINCIAL WATER SUPPLY, SEWERAGE AND  
SANITATION SECTOR PLAN  
IN  
THE REPUBLIC OF THE PHILIPPINES

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

MANILA, MARCH 8, 1995

  
HON. YOLANDA MA. L. DE LEON  
Assistant Secretary  
Dept. of the Interior and Local Government

  
MR. MASATOSHI MOMOSE  
Team Leader, Study Team  
Japan Int'l. Cooperation Agency



The Stage II field work for "the Study on Provincial Water Supply, Sewerage and Sanitation Sector Plan" (hereinafter referred to as "the Study") resumed on January 14, 1995 and completed on March 14, 1995.

Conditions and assumptions for development of Medium-Term and Long-Term sector plans were discussed and finalized between respective PSPTs and JICA Study Team through the conduct of Workshop No. 3.

Progress Report II, as a draft of PW4SP, was prepared. In this connection, contents of the report were basically agreed upon on March 8, 1995 between JICA Study Team and officials concerned in the Philippine side. The list of attendees to the meeting is presented in Appendix A.

The following are future arrangements required by both parties:

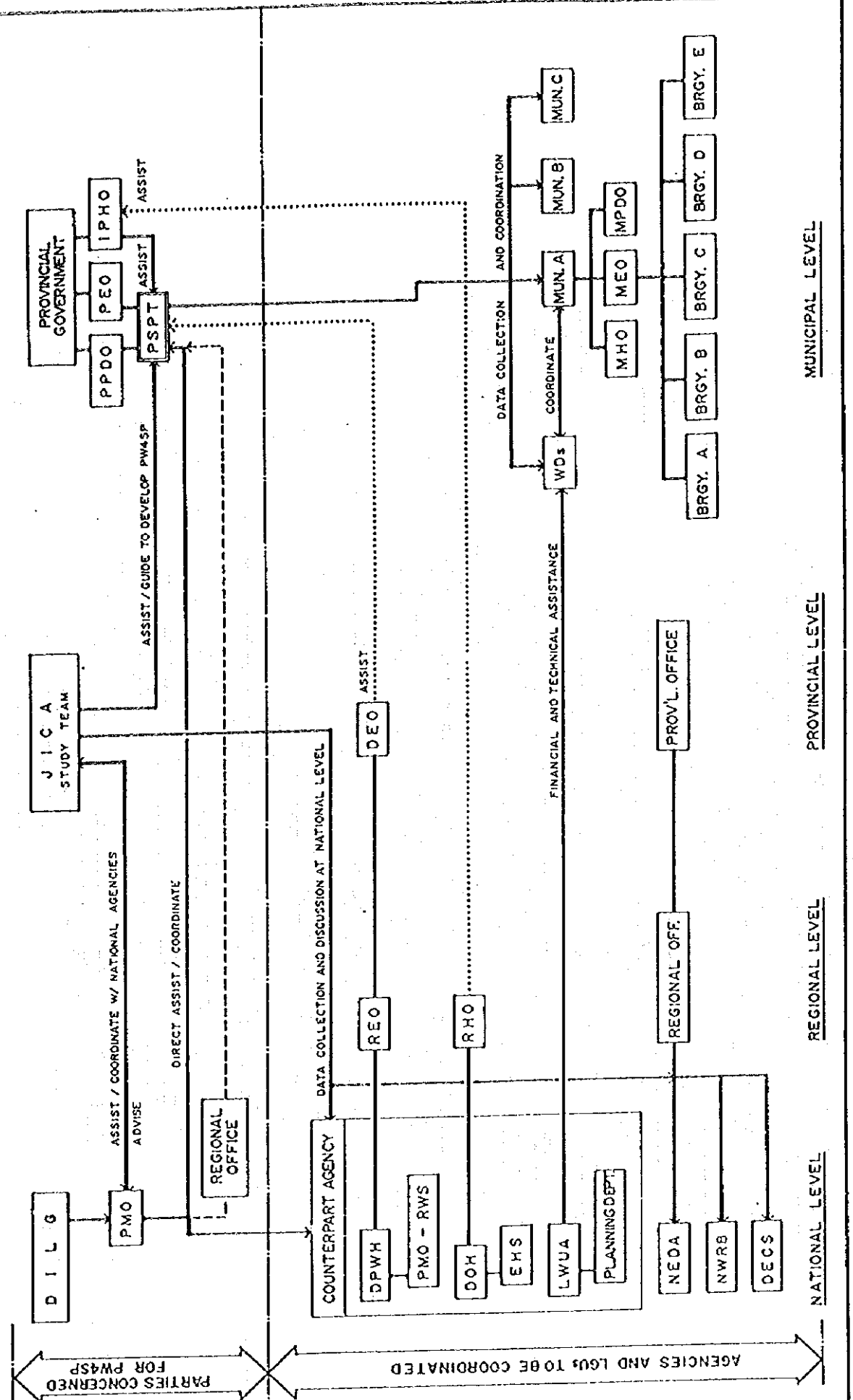
- (1) DILG will follow-up Batch No. 2 provinces for implementation of the PW4SPs, ascertaining the peace and order situation in the provinces.
- (2) The starting date of the third field work by JICA Study Team for Batch No. 2 will be informed to DILG through JICA Philippine Office.

Appendix A

LIST OF ATTENDEES

<u>Attendees</u>	<u>Designation</u>
<b>A. DILG</b>	
1. MR. ORVILLE M. ROQUE	Project Manager, PMO
2. MS. ELLEN I. PASCUA	Assistant Project Manager, PMO
3. MR. ROGELIO B. OCAMPO	Chief, Planning Div., PMO
4. MS. FE CRISILLA M. BANLUTA	PW4SP Overall Coordinator, PMO
5. MS. JOSEPHINE RAMOS	DILG Coordinator, Oriental Mindoro
6. MS. LINA GRIEGO	DILG Coordinator, Occidental Mindoro
7. MS. MA. CONTESSA NAVARRO	DILG Coordinator, Rizal
8. MS. VIVIAN BIALA	DILG Coordinator, Zambales
<b>B. OTHER AGENCIES</b>	
1. MR. VIRGILIO GACUSANA	Chief, Planning Division, PMO, DPWH
<b>C. JICA</b>	
1. MR. EIJI IWASAKI	Asst. Resident Representative, Philippine Office
2. MR. NOBUAKI MIYATA	Second Development Study Div., Social Development Study Dept.
<b>D. JICA Study Team</b>	
1. MR. MASATOSHI MOMOSE	Team Leader
2. MR. MASUOMI HIROYAMA	Water Supply Engineer
3. MS. YOLANDA M. MINGOA	Sanitary Engineer
4. MR. WILFREDO C. BARREIRO	Institutional/CD/T Specialist
5. MR. MANABU FUJIKAWA	Financial Specialist
6. MR. ALLEN LOWE	System Engineer


FIGURE 1.3.1  
ORGANIZATION CHART FOR IMPLEMENTATION OF PW4SP

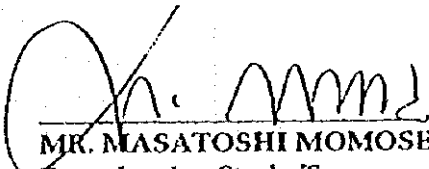


MINUTES OF DISCUSSIONS  
ON  
THE DRAFT FINAL REPORT  
FOR  
STUDY ON PROVINCIAL WATER SUPPLY, SEWERAGE AND  
SANITATION SECTOR PLAN  
IN  
THE REPUBLIC OF THE PHILIPPINES

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

MANILA, DECEMBER 7, 1995

  
HON. YOLANDA MA. L. DE LEON  
Assistant Secretary  
Dept. of the Interior and Local Government


  
MR. MASATOSHI MOMOSE  
Team Leader, Study Team  
Japan Int'l. Cooperation Agency

The Stage III field work for Batch II for "the Study on Provincial Water Supply, Sewerage and Sanitation Sector Plan" (hereinafter referred to as "the Study") started on May 22, 1995 and will be completed on December 15, 1995.

Major conditions and assumptions for the development of Medium-Term and Long Term sector plans for the remaining five (5) provinces under Batch II were discussed and finalized between respective PSPTs and JICA Study Team through the conduct of Workshop No. 3.

The Draft Final Reports for the nine (9) provinces, which cover all outputs during the study period, were prepared for respective provinces. The contents of the report were basically agreed upon on December 7, 1995 between JICA Study Team and officials concerned in the Philippine side. The list of attendees to the meeting is presented in Appendix A. The following were confirmed and/or agreed upon by both parties.

1. Correction of typographical errors of the Draft Final Report will be undertaken by the Study Team prior to printing of the Final Report.
2. Adoption of the Plans (Batch II) by the Provincial Council (Sangguniang Panlalawigan) shall be facilitated by DILG in the same manner as Batch I.
3. Inclusion of the Message of the Governor in the Main Report of respective PW4SPs.



## LIST OF ATTENDEES

<u>Attendees</u>	<u>Designation</u>
<b>A. DILG</b>	
1. HON. YOLANDA MA. L. DE LEON	Assistant Secretary
2. MR. ORVILLE M. ROQUE	Program Manager, PMO
3. MS. ELLEN I. PASCUA	Asst. Program Manager, PMO
4. MR. ROGER OCAMPO	Chief, Planning Div., PMO
5. MR. MARIO VERGEL DE DIOS	Chief, Operations Div., PMO
6. MS. FE CRISILLA M. BANLUTA	PW4SP Overall & Ilocos Norte Coordinator
7. MS. JOSEPHINE RAMOS	DILG Coordinator, Abra & Or. Mindoro
8. MS. LINA GRIEGO	DILG Coordinator, Batanes & Occ. Mindoro
9. MS. MA. CONTESSA NAVARRO	DILG Coordinator, Nueva Vizcaya & Rizal
10. MS. VIVIAN BIALA	DILG Coordinator, Ilocos Sur & Zambales
<b>B. OTHER AGENCIES</b>	
1. MR. ROGELIO A. FLORES	Director, PMO-RWS, DPWH
2. MR. VIRGILIO GACUSANA	Chief, Planning Division, PMO, DPWH
3. MR. VICTOR SABANDEJA	Chief, Environmental Health Division, DOH
4. MR. ANIANO FORNELOS JR.	Sanitary Engineer II, DOH
5. MR. JOSE RENE RONCESVALLES	Program Manager, LWUA
<b>C. JICA</b>	
1. MR. SHIGEYUKI MATSUMOTO	2nd Development Study Div., Social Development Study Dept.
<b>D. JICA Study Team</b>	
1. MR. MASATOSHI MOMOSE	Team Leader
2. MR. MASUOMI HIROYAMA	Water Supply Engineer
3. MS. YOLANDA M. MINGOA	Sanitary Engineer
4. MR. WILFRIDO C. BARREIRO	Institutional/CD/T Specialist
5. MR. ALLEN LOWE	System Engineer

2. **PLANNING APPROACH FOR FUTURE SECTOR DEVELOPMENT**  
2.6 **Planning Principles and Data Management**  
2.6.2 **Data Management**

(1) **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 into 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 to 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 supports 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 advantages and disadvantages of the spreadsheet method with reference to database method.

<u>Advantage</u>	<u>Disadvantage</u>
1. Minimum programming skills	1. Repeated entry of same formula
2. Friendly environment to users	2. Sorting or indexing is done manually
3. Graphic presentation of data at user's option	3. All data are loaded in memory, which require huge amount of memory
4. Execution of data linkage 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 assumptions are entered into key parameter tables. These data are then processed and finally consolidated into target forms. These final forms 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	<b>Water Supply</b> Number of household to be served by Level I Facility Water Consumption Rate for Level III System <b>Sanitation</b> Std. number of student to be served by a unit of sanitary toilet Standard number of toilets for a public utility	HH/Facility Liter/capita/day Student/Toilet Toilet/Public Facility	
2.	Provincial Sector Target	<b>Medium Term Plan</b> <b>Water Supply</b> Urban Water Supply Rural Water Supply <b>Sanitation</b> Household Toilet <i>Urban Household Toilet</i> Flush Pour Flush VIP Latrine <i>Rural Household Toilet</i> Flush Pour Flush VIP Latrine School Toilet Public Toilet Solid Waste <b>Long Term Plan</b> <b>Water Supply</b> Urban Water Supply Rural Water Supply <b>Sanitation</b> Household Toilet <i>Urban Household Toilet</i> Flush Pour Flush VIP Latrine <i>Rural Household Toilet</i> Flush Pour Flush VIP Latrine School Toilet Public Toilet Urban Sewerage	% of Population % of Population % of Household % of Household % of Household % of Household % of Household % of Household % of Household % of Public Student % of Public Utility % of Population % of Population % of Population % of Household % of Household % of Household % of Household % of Household % of Household % of Household % of Public Student % of Public Utility % of Urban Population	
3.	Percentage of Level I Wells for Rehabilitation		%	
4.	Percentage of Sector Management Cost to Construction Cost		% of Construction Cost % of Construction Cost	
5.	Contingencies		% of Construction Cost Percent per annum	
6.	Community Development and Training Cost		% of Construction Cost % of Construction Cost	
7.	Recurrent Cost	Level III System (Operating Cost) Level III System (Spare Parts/Equipment) Level II System (Spare Parts/Equipment) Level I System (Spare Parts/Equipment) Public School Toilet Maintenance Cost Public Utility Toilet Maintenance Cost	Pesos/HH/year % of Construction Cost Pesos/HH/year Pesos/HH/year Pesos/Toilet/year Pesos/Toilet/year	
8.	Allocation factors/Percentages of IRA		% %	
9.	Funding Levels/Percentages for Different Financing Scenarios		% Funding Available % Funding Available % Funding Available % Funding Available % Funding Available	



Table 2.6.2 Composition of Well Sources and Specific Capacity

Municipality	Area	Source	Proportion (%)	Standard Specification		
				Depth (m)	SWI. (m)	Specific Capacity (lit/sec/m)
	Rural	Shallow Well				
		Deep Well				
	Urban	Shallow Well				
		Deep Well				
	Rural	Shallow Well				
		Deep Well				
	Urban	Shallow Well				
		Deep Well				
	Rural	Shallow Well				
		Deep Well				
	Urban	Shallow Well				
		Deep Well				
	Rural	Shallow Well				
		Deep Well				
	Urban	Shallow Well				
		Deep Well				
	Rural	Shallow Well				
		Deep Well				
	Urban	Shallow Well				
		Deep Well				
	Rural	Shallow Well				
		Deep Well				
	Urban	Shallow Well				
		Deep Well				
	Rural	Shallow Well				
		Deep Well				
	Urban	Shallow Well				
		Deep Well				
	Rural	Shallow Well				
		Deep Well				
	Urban	Shallow Well				
		Deep Well				
	Rural	Shallow Well				
		Deep Well				
	Urban	Shallow Well				
		Deep Well				
	Rural	Shallow Well				
		Deep Well				
	Urban	Shallow Well				
		Deep Well				
	Rural	Shallow Well				
		Deep Well				
	Urban	Shallow Well				
		Deep Well				



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
<b>Water Supply</b>					
<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 - 30 meter depth					
Deep Well - 50 meter depth					
Deep Well - 70 meter depth					
Shallow Well					
Spring Development					
<i>Rehabilitation Cost for Level I Deep Well</i>					
<i>Disinfection of Level I Wells</i>					
<b>Sanitation</b>					
Flush					
Pour Flush					
VIP Latrine					
School Toilet					
Public Toilet					
Urban Sewerage					

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

Unit: Percent

Score	Underserved and Uninsured Population in Base Year	Underserved and Uninsured Population in Phase I	Population Uninsured by Level III Systems in Base Year
1.0	< %	< %	< %
0.8	< %	< %	< %
0.6	< %	< %	< %
0.4	< %	< %	< %
0.2	%	%	%
Weight Allocation Score			

Table 2.6.7 Scoring Factor for Municipal Comprehensive Investment Ranking

Unit: Percent

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 Household Income

**Table 3.3.1 Distribution of Household by Income Class**

Income Class	Abra				CAR	
	Total Families(2)		Annual Income		Total Number of Families	Average Annual Income (Pesos)
	Number	Share	Total (P 1,000)	Average (Pesos)		
Under 15,000	13,813	37.06	145,325	10,521	28,847	9,890
15,000 - 19,999	3,784	10.15	64,881	17,144	15,689	17,013
20,000 - 29,999	6,055	16.24	145,306	23,998	30,513	25,741
30,000 - 39,999	4,825	12.94	163,683	33,925	25,466	34,834
40,000 - 59,999	4,447	11.93	206,096	46,349	57,895	49,145
60,000 - 99,999	3,122	8.38	228,604	73,219	38,473	75,939
100,000 - 249,999	1,230	3.30	185,826	151,078	27,172	141,034
250,000 and over	0	0.00	0	0	3,663	439,025
Total/Average	37,276	100.00	1,139,721	30,576	227,718	58,985
Median	-	-	-	21,239	-	43,800

Source: 1991 Family Income and Expenditures Survey, NSO

Note:

(1) Based on NEDA and other agencies, poverty threshold in CAR in 1991 was estimated at P39,400. Proportion of families below poverty level was 76% in the same year.

(2) 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 to the head by blood, marriage or adoption. A single person living alone is considered as a separate family.

Table 3.3.2 Gainful Workers by Occupation Group and Major Industry Group

Major Occupation Group	Gainful Workers 15 Years Old and Over	MAJOR INDUSTRY GROUP				
		Agriculture, Fishery and Forestry	Mining and Quarrying	Manufacturing	Electricity, Gas and Water	Construction
Total	65,146	34,902	337	1,821	210	890
Official of Gov't. & Special Interest Org., Corp. Executives, Managers, Managing Prod. & Supervisors	1,201	8	-	33	11	23
Professional	2,795	13	-	31	-	37
Technicians and Associated Professional	608	18	-	13	-	-
Clerks	1,935	19	-	1	89	-
Service & Shop Market Sales Workers	1,774	9	5	18	13	-
Farmers, Forestry Workers & Fishermen	34,842	34,534	-	40	-	-
Craft and Related Workers	2,704	-	17	1,409	86	664
Plant & Machine Operators and Assemblers	1,237	59	-	114	-	14
Elementary Occupations	5,558	59	115	38	-	137
Other Occupations	2,676	183	-	124	11	15
Occupation Not Stated	9,816	-	-	-	-	-

Major Occupation Group	MAJOR INDUSTRY GROUP					
	Wholesale and Retail Trade	Transportation and Communication	Financing, Insurance, Real Estate and Business Services	Community, Social and Personal Services	Activities Not Adequately Defined	Not Stated
Total	2,820	1,533	397	10,116	2,504	9,816
Official of Gov't. & Special Interest Org., Corp. Executives, Managers, Managing Prod. & Supervisors	370	58	5	645	48	-
Professional	10	10	20	2,396	278	-
Technicians and Associated Professional	10	20	58	436	53	-
Clerks	756	107	97	719	147	-
Service & Shop Market Sales Workers	609	123	173	695	129	-
Farmers, Forestry Workers & Fishermen	57	-	-	47	164	-
Craft and Related Workers	87	21	10	242	168	-
Plant & Machine Operators and Assemblers	27	755	-	191	77	-
Elementary Occupations	714	434	10	3,764	287	-
Other Occupations	180	5	24	981	1,153	-
Occupation Not Stated	-	-	-	-	-	9,816

Source: NSO Census 1990

### 3.3.3 Education

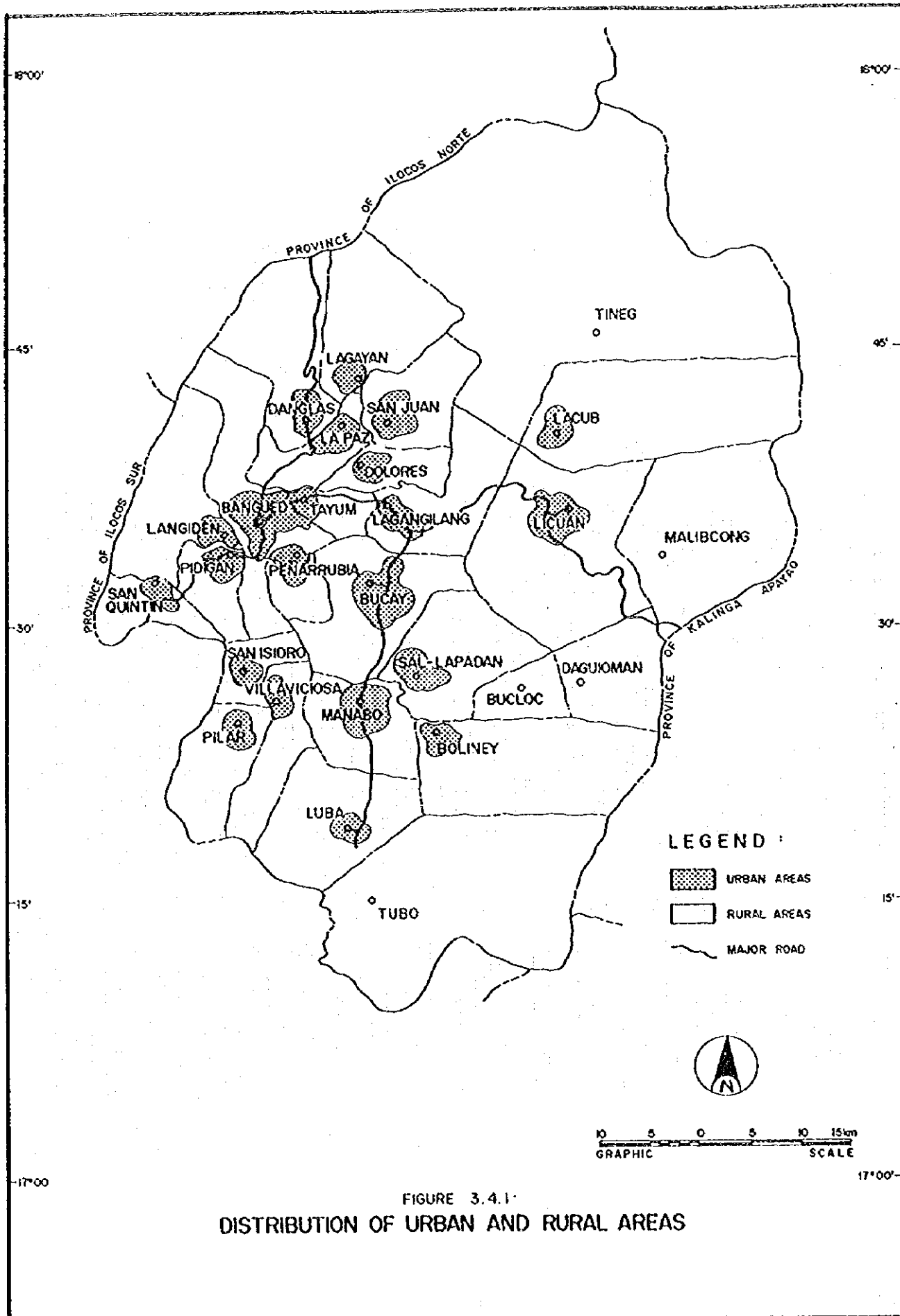
**Table 3.3.3 Household Population by Highest Educational Attainment**

Highest Educational Attainment	Household Population 7 Years Old and Over	Age Group						
		Below 20	20-24	25-29	30-34	35-39	40-44	45 & Over
Total	150,916	55,572	16,003	14,079	12,431	10,062	7,881	31,888
No Grade	8,440	1,965	218	237	264	254	256	5,246
Pre-School	1,491	1,380	10	10	14	4	6	67
Elementary	76,314	33,600	3,652	3,986	4,711	4,752	4,149	21,464
1st - 4th Grade	38,797	22,077	1,056	1,076	1,303	1,354	1,233	10,698
5th - 7th Grade	37,517	11,523	2,596	2,910	3,408	3,398	2,916	10,766
High School	39,954	11,510	6,333	5,025	3,973	2,713	1,833	4,567
Undergraduate	20,609	11,098	2,286	1,714	1,406	1,025	812	2,268
Graduate	19,345	4,412	4,047	3,311	2,567	1,688	1,021	2,299
Post Secondary	4,713	518	1,210	1,005	809	427	214	530
Undergraduate	1,034	189	252	191	149	99	42	112
Graduate	3,679	329	958	814	660	328	172	418
College Undergraduate	10,782	2,331	2,912	1,880	1,325	826	537	917
Academic Degree Holder	8,367	38	1,565	1,833	1,257	1,041	833	1,800
Not Stated	855	230	103	103	78	45	53	243

Source: NSO Census 1990

### 3.4 Population

#### 3.4.2 Classification of Urban and Rural Areas





### 3.5 Health Status

#### 3.5.3 Health Facilities and Practitioners

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

Health Facilities	Abra		Philippines	
	Number	Ratio	Number	Ratio
Hospitals	5	1:39,856	1,733	1:35,017
RHUs	27	1:7,381	2,295	1:26,442
BHSs	94	1:2,120	10,151	1:5,978
<b>Practitioners</b>				
Doctors	25	1:7,971	7,431	1:8,166
Nurses	29	1:6,872	10,270	1:5,909
Midwives	96	1:2,076	11,604	1:5,230
Dentists	4	1:49,820	1,550	1:39,152

### 3.6 Environmental Conditions

#### 3.6.2 Water Pollution

**Table 3.6.1 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 <sup>(D)</sup> (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
Dissolved Oxygen <sup>(B)</sup> (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 which 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

NEDA Geo- graphic Code	Municipality	Name of Sytem (Operating Body)	Level III Services								
			Number of Barangays Served			Number of Households Served			Number of Population Served		
			Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
010101	Bangued (Capital)	Bangued W.D	8	14	22	1,945	793	2,743	10,309	4,309	14,618
010102	Boliney	Baoyan W.S		1	1		63	63		315	315
		Boliney W.S	1		1	135		135	675		675
		Danac W.S		2	2		189	189		945	945
		Daaoangan W.S		1	1		98	98		490	490
		Dumagas W.S		1	1		40	40		200	200
		Kilong-Olao W.S		1	1		53	53		315	315
	Municipal Total		1	6	7	135	443	578	675	2,265	2,940
010103	Bucay	Bangcagan B.W.S.A		1	1		58	58		290	290
010106	Danglas	Abaquid W.A.		1	1		43	43		215	215
010107	Dolores	Cabarcan W.S.		1	1		25	25		125	125
		Dolores W.D	1		1	250		250	1,250		1,250
	Municipal Total		1	1	2	250	25	275	1,250	125	1,375
010109	Lagangilang	Lagangilang W.D	2	2	4	205	87	292	1,025	435	1,460
010113	Licuan	Bonglo W.S		1	1		31	31		155	155
		Bulbulala W.S		1	1		56	56		280	280
		Canayan W.S		1	1		37	37		185	185
		Dominglay W.S		1	1		29	29		145	145
		Mapista W.S	1		1	43		43	215		215
		Poblacion W.S	1		1	36		36	180		180
		Tumalip W.S		1	1		40	40		200	200
	Municipal Total		2	5	7	79	193	272	395	965	1,360
010114	Luba	Bangel W.S	1		1	163		163	815		815
		Luzong W.S		1	1		121	121		605	605
	Municipal Total		1	1	2	163	121	284	815	605	1,420
010117	Penarrubia	Bangued W.D	1	2	3	85	60	145	467	812	1,279
		Poblacion W.S.	1		1	36		36	198		198
		Sagsagacat W.S.	1	3	4	30	140	170	161	784	945
	Municipal Total		1*	5	6	151	200	351	829	1,596	2,425
010118	Pilar	Dalit W.S		1	1		90	90		450	450
		Dintan W.S		1	1		45	45		225	225
		Pang-ot W.S		1	1		58	58		290	290
		Poblacion W.S	1		1	200		200	1,000		1,000
	Municipal Total		1	3	4	200	193	393	1,000	965	1,965
010124	Tayum	Deet W.S		1	1		104	104		520	520
		Tayum Water Service C	1		1	300		300	1,500		1,500
	Municipal Total		1	1	2	300	104	404	1,500	520	2,020
010126	Tubo	Poblacion W.S		1	1		51	51		255	255
		Supo W.S		1	1		74	74		370	370
		Tub-tuba		1	1		40	40		200	200
		Wayangan W.S		1	1		78	78		390	390
	Municipal Total		0	4	4	0	243	243	0	1,215	1,215
Provincial Total			18	40	58	3,428	2,503	5,936	17,793	13,505	31,303

Note: \* 3 systems covering one urban barangay.

Table 4.1.1 Details on Existing Level III Systems (Provided by Level II Service)

Sheet 2

NEDA Geo- graphic Code	Municipality	Name of Sytem (Operating Body)	Level II Services								
			Number of Public Faucets			Number of Households Served			Number of Population Served		
			Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
010101	Bangued (Capital)	Bangued W.D			0			0			0
010102	Boliney	Baoyan W.S		1	1		16	16		80	80
		Boliney W.S	1		1	7		7	35		35
		Danac W.S		2	2		20	20		100	100
		Daangan W.S		1	1		10	10		50	50
		Dumagas W.S		1	1		12	12		60	60
		Kilong-Olao W.S		1	1		10	10		50	50
	Municipal Total		1	6	7	7	68	75	35	340	375
010103	Bucay	Bangcagan B.W.S.A		1	1		37	37		185	185
010106	Danglas	Abaquid W.A.			0			0			0
010107	Dolores	Cabaraoan W.S.			0			0			0
		Dolores W.D			0			0			0
	Municipal Total		0	0	0	0	0	0	0	0	0
010109	Lagangilag	Lagangilang W.D			0			0			0
010113	Licuan	Bonglo W.S		1	1		22	22		110	110
		Bulbulala W.S		1	1		13	13		65	65
		Canayan W.S		1	1		24	24		120	120
		Dominglay W.S		1	1		23	23		115	115
		Mapista W.S	1		1	24		24	120		120
		Poblacion W.S	1		1	14		14	70		70
		Tumali W.S		1	1		16	16		80	80
	Municipal Total		2	5	7	38	98	136	190	490	680
010114	Luba	Bangel W.S			0			0			0
		Luzong W.S		1	1		28	28		140	140
	Municipal Total		0	1	1	0	28	28	0	140	140
010117	Penarrubia	Bangued W.D			0			0			0
		Poblacion W.S.			0			0			0
		Sagsagat W.S.			0			0			0
	Municipal Total		0	0	0	0	0	0	0	0	0
010118	Pilar	Dalit W.S		1	1		36	36		180	180
		Dintan W.S		1	1		23	23		115	115
		Pang-et W.S		1	1		45	45		225	225
		Poblacion W.S	1		1	8		8	40		40
	Municipal Total		1	3	4	8	104	112	40	520	560
010124	Tayum	Deet W.S		1	1		35	35		175	175
		Tayum Water Service C	1		1	10		10	50		50
	Municipal Total		1	1	2	10	35	45	50	175	225
010126	Tubo	Poblacion W.S		1	1		19	19		95	95
		Supo W.S		1	1		40	40		200	200
		Tub-tuba			0			0			0
		Wayangan W.S			0			0			0
	Municipal Total		0	2	2	0	59	59	0	295	295
Provincial Total			5	19	24	63	429	492	315	2,145	2,460

Table 4.1.1 Details on Existing Level III Systems

Sheet 3

Sheet 3

NFDA Geo- graphic Code	Municipality	Name of Sytem (Operating Body)	Water Sources			Consumption			
			Type <sup>1</sup>	Number	Production (cu. m/day)	Domestic	Institutional	Commercial	Industrial
010101	Bangued (Capital)	Bangued W.D	SP	1	17,971.2	1,748	30	107	0
010102	Boliney	Boliney W.S	SP	1	69.12	0	0	0	0
		Booyan W.S	SP	1	228.90	0	0	0	0
		Danao W.S	SP	1	86.40	0	0	0	0
		Daangan W.S	SP	1	324.40	0	0	0	0
		Danagas W.S	SP	1	172.80	0	0	0	0
		Kilong-Otao W.S	SP	1	172.80	0	0	0	0
	Municipal Total			6	1,054.42	0	0	0	0
010103	Bucay	Bangcagan B.W.S.A	SP	1	216	0	0	0	0
010106	Danglas	Abaquid W.A.	SP	1	778	0	0	0	0
010107	Dolores	Cabaroan W.S	SP	1	2.88	0	0	0	0
		Dolores W.D	SP	1	129.6	0	0	0	0
	Municipal Total			2	132.48	0	0	0	0
010109	Lagangilag	Lagangilang W.D	DW	1		152	0	0	0
010113	Licuan	Poblacion W.S	SP	1	86.4	0	0	0	0
		Bonglo W.S	SP	1	86.4	0	0	0	0
		Bulbulala W.S	SP	1	86.4	0	0	0	0
		Canayan W.S	SP	1	129.60	0	0	0	0
		Dominglay W.S	SP	1	172.80	0	0	0	0
		Mapista W.S	SP	1	172.80	0	0	0	0
		Tumalip W.S	SP	1	86.40	0	0	0	0
	Municipal Total			7	820.80	0	0	0	0
010114	Luba	Bangel W.S	SP	1	216.0	0	0	0	0
		Luzong W.S	SP	1	172.8	0	0	0	0
	Municipal Total			2	388.8	0	0	0	0
010117	Penarrubia	Bangued W. D	SP	N.A.	N.A.	0	0	0	0
		Poblacion W.S.	SP	1	N.A.	0	0	0	0
		Sagsagacat W.S.	SP	1	172.8	0	0	0	0
	Municipal Total			2	172.8	0	0	0	0
010118	Pilar	Dalit W.S	SP	1	172.8	0	0	0	0
		Dintan W.S	SP	1	17.28	0	0	0	0
		Pang-ot W.S	SP	1	172.8	0	0	0	0
		Poblacion W.S	SP	1	172.8	0	0	0	0
	Municipal Total			4	535.68	0	0	0	0
010124	Tayum	Deet W.S	DW	2	288	0	0	0	0
		Tayum Water Service Corp.	DgW	1	18	2	0	0	0
	Municipal Total			3	306	2	0	0	0
010126	Tuba	Poblacion W.S	SP	1	65	0	0	0	0
		Supo W.S	SP	1		0	0	0	0
		Tub-tuba	SP	1	86.4	0	0	0	0
		Wayangan W.S	SP	1	72	0	0	0	0
	Municipal Total			4	223.4	0	0	0	0
Provincial Total				32	N.A.	N.A.	N.A.	N.A.	N.A.

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

Table 4.1.1 Details on Existing Level III Systems

Sheet 4

Sheet 4

NEZA Geo- graphic Code	Municipality	Name of System (Operating Body)	Consumers														
			Domestic House Connections			Domestic Public Faucets			Institutional			Commercial			Industrial		
			Connection		Consumption	Connection		Consumption	Connection		Consumption	Connection		Consumption	Connection		Consumption
			Metered	Unmetered	(cu.m/day)	Metered	Unmetered	(cu.m/day)	Metered	Unmetered	(cu.m/day)	Metered	Unmetered	(cu.m/day)	Metered	Unmetered	(cu.m/day)
010101	Bangueo (Capital)	Bangueo W.D.	2,743	63	1,747.8		3		30			76			107		
010102	Boliney	Boliney W.S.		135			4										
		Dinas W.S.		189			2										
		Dacangan W.S.		98			2										
		Dumagas W.S.		40			2										
		Kilong-Olao W.S.		53			2										
		Municipal Total	0	578	N.A.	0	13	N.A.	0	0	0	0	0	0	0	0	
010103	Bucay	Bangueo B.W.S.A.		58			12										
010106	Danglas	Abaguid W.A.		43													
010107	Dolores	Cabatuan W.S.		25													
		Dolores W.D.	250														
		Municipal Total	250		N.A.	0	0	N.A.	0	0	0	0	0	0	0	0	
010109	Lagangilang	Lagangilang W.D.	292		152		5										
010113	Luzon	Bonglo W.S.		31			7										
		Bulbulala W.S.		56			9										
		Canayan W.S.		37			6										
		Domingday W.S.		29			8										
		Mapula W.S.		43			7										
		Population W.S.		36			6										
		Tumali W.S.		40			6										
		Municipal Total	0	272	N.A.	0	48	N.A.	0	0	0	0	0	0	0	0	
010114	Lube	Bangel W.S.		163			5										
		Luzong W.S.		121			5										
		Municipal Total	0	284	N.A.	0	5	N.A.	0	0	0	0	0	0	0	0	
010117	Penarrubia	Bangueo W.D.	145														
		Population W.S.		56													
		Sagagagat W.S.		298													
		Municipal Total	145	354	N.A.	0	0	N.A.	0	0	0	0	0	0	0	0	
010118	Pilar	Dalit W.S.		90			2										
		Dinan W.S.		45			6										
		Pangot W.S.		58			5										
		Population W.S.		200			1										
		Municipal Total	0	393	N.A.	0	14	N.A.	0	0	0	0	0	0	0	0	
010124	Tayum	Tayum Water Service Corp.	300				2		1.5								
		Deet W.S.	14	90			7										
		Municipal Total	314	90	N.A.	2	7	N.A.	0	0	0	0	0	0	0	0	
010126	Tubo	Population W.S.		51			5										
		Supo W.S.		74			8										
		Tububa		40													
		Wangan W.S.		78													
		Municipal Total	0	243	N.A.	0	13	N.A.	0	0	0	0	0	0	0	0	
		Provincial Total	3,744	1,986	N.A.	2	112	N.A.	3	0	0	30	76	0	107	0	

#### 4.1.4 Level II Systems

Table 4.1.2 Existing Level II Systems

Sheet 1

NEDA Geo- graphic Code	Municipality	Name of System (Operating System)	Water Source		Length of Transmission Line (meter)	Existing Facilities			Number of Public Faucets
			Type <sup>1</sup>	Number		Reservoir Number	Q (cu.m)	Length of Distribution Line (meter)	
010101	Bangued (Capital)	Angad W.S	SP	1	950	1	12	400	15
		Lingtan W.S	SP	1	N.A	1	8		12
		Macaracamay W.S	SP	1	N.A	1	8		15
		Maoy W.S	SP	1	750	1	8	400	12
		Pafao W.S	SP	1	N.A	1	12		35
		Sao-Atan W.S	SP	1	800	1	8	400	7
		<b>Municipal Total</b>		6	N.A	6	56	1,200	96
010103	Bucay	Abang BWSA	SP	1	N.A	1	8		20
		Bangbangcag BWSA	SP	1	N.A	1	12		12
		Banglolao DWSI	SP	1	N.A	1	8		10
		Bocay WS	SP	1	N.A	1	12		30
		Bagbog BWSA	SP	1	N.A	1	8		5
		Calao BWSA	SP	1	N.A	1	8		12
		Dugong BWSA	SP	1	N.A	1	12		30
		Labon BWSA	SP	1	N.A	1	12		12
		Layugan BWSA	SP	1	N.A	1	8		4
		Madalipay BWSA	SP	1	N.A	1	8		6
		Pakiling BWSA	SP	1	N.A	1	8		10
		Palaquio BWSA	SP	1	N.A	1	12		20
		Quimloong WSA	SP	1	N.A	1	8		12
		Salnee BWSA	SP	1	N.A	1	8		8
		Siblong BWSA	SP	1	800	1	8	1,290	5
		Tabiog WSA	SP	1	1,000	1	8	400	3
		<b>Municipal Total</b>		16	N.A	16	143	1,690	199
010104	Bucloc	Duchigan WS	SP	1	N.A	1	8		3
		Labaan WS	SP	1	N.A	1	9		4
		Lamiao WS	SP	1	N.A	1	8		8
		Lingey WS	SP	1	500	1	8		21
		<b>Municipal Total</b>		4	N.A	4	33	0	36
010105	Daguioman	Ableg WS	SP	1	6,000	1	8	200	3
		Cabaruyan WS	SP	1	4,000	1	12	N.A	4
		Pikek WS	SP	1	4,000	1	8	N.A	4
		Tui WS	SP	1	4,000	1	12	N.A	12
		<b>Municipal Total</b>		4	18,000	4	40	N.A	23
010106	Danglas	Cabaruan WS	SP	1	375	1	8	N.A	12
		Caupasan WSA	DgW	1	24	1	22.5	200	10
		Danglas WSA	SP	1	3,000	1	12	300	11
		Domeguiay WSA	SP	1	N.A	1	8	N.A	4
		<b>Municipal Total</b>		4	N.A	4	51	N.A	37
010107	Dolores	Bayaan WS	SP	1	1,500	1	8	400	7
		Kimimalaba WS	SP	1	1,500	1	8	1,000	5
		Namit-ingan WS	SP	1	3,000	1	8	900	6
		Taping WS	SP	1	2,500	1	8	500	3
		<b>Municipal Total</b>		4	8,500	4	32	2,800	21
010108	Iacub	Bocag WS	SP	1	1,500	1	8	1,750	4
		Balaogang WS	SP	1	1,200	1	8	1,500	2
		Buneg WS	SP	1	2,500	1	8	3,000	4
		Pacoc WS	SP	1	2,000	1	8	2,600	3
		Poblacion WS	SP	1	2,500	1	8	3,200	12
		Sap-al WS	SP	1	3,000	1	8	3,500	4
		<b>Municipal Total</b>		6	12,700	6	48	15,550	29
10110	Lagayan	Calambat	SP	1	N.A	1	18.75	N.A	7
		Collago WS	SP	1	N.A	1	18.75	N.A	13
		<b>Municipal Total</b>		2	N.A	2	37.50	N.A	20

Table 4.1.2 Existing Level II Systems (Cont.)

Sheet 1

NEDA Geo- graphic Code	Municipality	Name of System (Operating System)	Water Source		Existing Facilities				Number of Public Faucets
			Type <sup>1</sup>	Number	Length of Transmission Line (meter)	Reservoir		Length of Distribution Line (meter)	
010111	Langiden	Baac WS	SP	1	540	1	27	775	4
		Poblacion WS	SP	1	4,000	1	8	3,000	5
		Quilat WS	SP	1	500	1	12	1,000	5
		<b>Municipal Total</b>		3	5,040	3	47	4,775	14
010113	Licuan	Leneng WS	SP	1	2,500	1	18	500	4
		Mogao WS	SP	5	N.A.	5	90	N.A.	8
		Nalbuan-Subagan WS	SP	2	5,000	1	8	900	12
		<b>Municipal Total</b>		8	7,500	7	116	1,400	24
010114	Luba	Ampalick WS	SP	1	2,300	1	8	500	7
		Barit WS	SP	1	2,300	1	8	400	6
		Gayaman WS	SP	1	2,000	1	8	400	12
		Lul-luno WS	SP	1	2,300	1	8	500	6
		Nagtuquipa WS	SP	1	2,000	1	8	400	6
		Pega WS	SP	1	600	1	5	400	4
		<b>Municipal Total</b>		6	11,500	6	45	2,600	41
010115	Malibcong	Adugao WS	SP	1	N.A.	1	8	N.A.	3
		Bayabas WS	SP	1	N.A.	1	8	N.A.	6
		Buanao WS	SP	1	N.A.	1	8	N.A.	10
		Cubcuba WS	SP	1	N.A.	1	8	N.A.	3
		Dulao WS	SP	1	N.A.	1	8	N.A.	6
		Duldulao WS	SP	1	N.A.	1	8	N.A.	10
		Gacab WS	SP	1	N.A.	1	8	N.A.	12
		Malibcong WS	SP	1	N.A.	1	8	N.A.	12
		Manapnap WS	SP	1	N.A.	1	8	N.A.	3
		Matalibeng WS	SP	1	N.A.	1	8	N.A.	4
		Mataragan WS	SP	1	N.A.	1	8	N.A.	6
		Pacqued WS	SP	1	N.A.	1	8	N.A.	8
		Taripan WS	SP	1	N.A.	1	8	N.A.	8
		Umaap WS	SP	1	N.A.	1	8	N.A.	6
		<b>Municipal Total</b>		14	N.A.	14	112	N.A.	97
010116	Manabo	Ayyeng WS	SP	1	300	1	27	1,500	13
		Banot WS	SP	1	500	1	8	300	10
		Catodegan WS	SP	1	870	1	18	500	16
		Liagan WS	SP	1	2,000	1	18	300	15
		Luzong WS	SP	1	990	1	27	1,300	18
		Madago WS	SP	1	1,500	1	8	300	10
		San Juan WS	SP	1	3,000	1	8	600	20
		St. Jose WS	SP	1	860	1	27	750	16
		Sto. Tomas WS	SP	1	860	1	8	400	7
		Villa Coachita W.S.A	SP	1	300	1	27	200	8
		<b>Municipal Total</b>		10	11,180	10	176	6,150	133
010117	Penarrubia	Lusuac WS	SP	1	N.A.	4	40	N.A.	36
010118	Pidigan	Immuli WS	SP	1	N.A.	1	8	N.A.	4
		Maloblobo & Tanibo WS	SP	2	13,000	2	16	N.A.	50
		Panglod WS	SP	1	N.A.	1	8	N.A.	4
		Suyo WS	SP	1	N.A.	1	8	N.A.	4
		<b>Municipal Total</b>		5	N.A.	5	40	N.A.	62
010119	Pilar	Nagcawasan WS	SP	1	2,000	1	5	500	6
		Namara WS	SP	1	2,000	1	5	500	6
		Ocop WS	SP	1	2,500	1	5	500	6
		Palicao WS	SP	1	1,500	1	5	400	5
		San Juan WS	SP	1	2,500	1	5	400	6
		<b>Municipal Total</b>		5	10,500	5	25	2,300	29



Table 4.1.2 Existing Level II Systems (Cont.)

Sheet 1

NEDA Geo- graphic Code	Municipality	Name of System (Operating System)	Water Source		Existing Facilities				
			Type <sup>1</sup>	Number	Length of Transmission Line (meter)	Reservoir Number	Q (cu.m)	Length of Distribution Line (meter)	Number of Public Faucets
010120	Sal-lapadan	Bazar WS	SP	4	4,940	4	51	N.A.	20
		Bilabila WS	SP	1	2,560	1	8	N.A.	10
		Gangal WS	SP	2	3,500	2	24	N.A.	12
		Maguyeyyep WS	SP	3	9,750	3	32	N.A.	12
		Naguilian WS	SP	3	5,680	3	24	N.A.	15
		Sacaang WS	SP	2	6,512	2	20	N.A.	15
		Sallapadan WS	SP	1	186	1	8	N.A.	8
		Subusub WSA	SP	2	6,012	2	20	N.A.	12
		Ud-udiao WS	SP	3	4,250	3	24	N.A.	15
	Municipal Total				21	43,390	21	211	N.A.
010121	San Isidro	San Isidro WS	SP	1	2,500	4	32	1,000	20
010122	San Juan	Poblacion WS	SP	1	3,000	1	5	5,300	9
010123	San Quintin	Carsuan WS	SP	1	1,000	1	4	N.A.	3
		Labaan WS	SP	1	1,000	1	4	N.A.	2
		Palang WS	SP	1	4,000	1	8	1,500	5
		Pantoc WS	SP	1	5,000	3	32	2,000	22
		Poblacion WS	SP	1	3,000	1	27	2,000	10
		Talaytay WS	SP	1	500	1	4	N.A.	2
		Tangadan WS	SP	3	450	3	35	N.A.	31
		Villa Mercedes WS	SP	1	N.A.	1	8	N.A.	3
	Municipal Total				10	N.A.	12	122	N.A.
010124	Tayum	Basbasa WS	SP	1	3,000	1	7	3,000	10
		Budac WS	SP	1	5,000	2	8	2,000	20
		Gaddani WS	SP	1	5,000	2	8	3,000	20
		Velasco WS	SP	1	1,370	4	4	N.A.	22
	Municipal Total				4	14,370	9	27	N.A.
010125	Tineg	Agsumao WS	SP	1	400	1	27	500	12
		Alada WS	SP	1	400	1	3	200	4
		Apao WS	SP	1	400	1	3	100	4
		Caganayan WS	SP	1	1,200	1	27	500	10
		Cogon WS	SP	1	400	1	3	300	5
		Lanec WS	SP	1	300	1	3	100	5
		Lapat-Balanta WS	SP	1	400	1	3	200	5
	Municipal Total				7	3,500	7	69	1,900
010126	Tubo	Antuagan WS	SP	1	1,600	1	15	700	10
		Alangin WS	SP	1	N.A.	1	8	N.A.	11
		Apatan WS	SP	1	N.A.	1	8	N.A.	4
		Baclingayan WS	SP	1	N.A.	1	18	N.A.	7
		Bana WS	SP	1	N.A.	1	8	N.A.	4
		Kili-Tubo WS	SP	1	N.A.	1	18.75	N.A.	7
		Tabatab WS	SP	1	N.A.	1	8	N.A.	7
		Tiempo WS	SP	1	N.A.	1	8	N.A.	8
	Municipal Total				8	N.A.	8	91.75	N.A.
010127	Villaviciosa	Bollifising WS	SP	1	2,000	1	27	N.A.	4
		Calso WS	SP	1	1,000	3	24	N.A.	15
		Laplalog WS	SP	1	3,000	1	12	400	20
		Lumaba WS	SP	1	3,000	1	8	N.A.	20
		Poblacion WS	SP	1	2,000	1	8	N.A.	20
		Talamac WS	SP	1	1,000	1	8	N.A.	12
		Toquib WS	SP	1	500	1	8	N.A.	30
	Municipal Total				7	15,700	25	279	N.A.
Provincial Total				157	N.A.	187	1,883.25	N.A.	1,535

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

Table 4.1.2 Existing Level II Systems

Sheet 2

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Number of Barangays Served			Number of Households Served			Number of Population Served		
			Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
010101	Bangued (Capital)	Angad W.S.		1	1		74	74		400	400
		Lingtan W.S.		1	1		60	60		324	324
		Macarabay W.S.		1	1		75	75		405	405
		Maay W.S.		1	1		60	60		324	324
		Palao W.S.		1	1		175	175		945	945
		Sao-Atan W.S.		1	1		27	27		146	146
		<b>Municipal Total</b>	0	6	6	0	471	471	0	2,544	2,544
010103	Bucay	Abang BWSA		1	1		100	100		560	560
		Bangbangag BWSA		1	1		60	60		336	336
		Banglao DWSI		1	1		50	50		280	280
		Bucay WS	2	5	7	50	50	100	270	280	550
		Bugbog BWSA		1	1		25	25		140	140
		Cafao BWSA		1	1		60	60		336	336
		Dugong BWSA	1		1	150		150	810		810
		Labon BWSA		1	1		60	60		336	336
		Layugan BWSA		1	1		20	20		112	112
		Madalipay BWSA		1	1		30	30		168	168
		Pakilang BWSA		1	1		50	50		280	280
		Palauio BWSA		1	1		100	100		560	560
		Quimboong WSA		1	1		60	60		336	336
		Salnec BWSA		1	1		40	40		224	224
		Siblong BWSA		1	1		25	25		140	140
		Tabing WSA		1	1		15	15		84	84
		<b>Municipal Total</b>	3	19	22	200	745	945	1,080	4,172	5,252
010104	Bucloc	Ducigan WS		1	1		15	15		84	84
		Laboon WS		1	1		20	20		112	112
		Lamao WS		1	1		40	40		224	224
		Lingey WS		1	1		105	105		588	588
		<b>Municipal Total</b>	0	4	4	0	180	180	0	1,008	1,008
010105	Daguioman	Ableg WS		1	1		15	15		80	80
		Cabaruyan WS		1	1		20	20		106	106
		Pikek WS		1	1		20	20		106	106
		Tui WS		1	1		60	60		318	318
		<b>Municipal Total</b>	0	4	4	0	115	115	0	610	610
010106	Danglas	Cabaruan WS		1	1		60	60		306	306
		Caupasan WSA	1		1	50		50	260		260
		Danglas WSA		1	1		55	55		281	281
		Domaguay WSA	1		1	20		20	104		104
		<b>Municipal Total</b>	2	2	4	70	115	185	364	587	951
010107	Dolores	Boyaan WS		1	1		35	35		193	193
		Kimmlaba WS		1	1		25	25		138	138
		Namit-ingan WS		1	1		30	30		165	165
		Taping WS		1	1		15	15		83	83
		<b>Municipal Total</b>	0	4	4	0	105	105	0	579	579
010108	Lacub	Bacag WS		1	1		20	20		112	112
		Balaoang WS		1	1		10	10		56	56
		Buneg WS		1	1		20	20		112	112
		Pacoc WS		1	1		15	15		84	84
		Poblacion WS	1		1	60		60	324		324
		Sap-al WS		1	1		20	20		112	112
		<b>Municipal Total</b>	1	5	6	60	85	145	324	476	800
010110	Lagayan	Catambat		1	1		35	35		186	186
		Collago WS		1	1		65	65		345	345
		<b>Municipal Total</b>	0	2	2	0	100	100	0	531	531

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

Sheet 2

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Number of Barangays Served			Number of Households Served			Number of Population Served		
			Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
010111	Langiden	Base WS		1	1		20	20		98	98
		Poblacion WS	1		1	25		25	120		120
		Quillat WS		1	1		25	25		123	123
		<b>Municipal Total</b>	1	2	3	25	45	70	120	221	341
010113	Licuan	Lenneng WS		1	1		20	20		118	118
		Mogao WS		1	1		40	40		236	236
		Nalbuan-Subagan WS		2	2		60	60		354	354
		<b>Municipal Total</b>	0	4	4	0	120	120	0	708	708
010114	Luba	Ampalick WS		1	1		35	35		189	189
		Barit WS		1	1		30	30		162	162
		Gayaman WS		1	1		60	60		324	324
		Lul-luno WS		1	1		30	30		162	162
		Nagtuquipa WS		1	1		30	30		162	162
		Pega WS	1		1	20		20	116		116
		<b>Municipal Total</b>	1	5	6	20	185	205	116	999	1,115
010115	Malibcong	Adugao WS		1	1		13	13		77	77
		Bayabas WS		1	1		29	29		171	171
		Buanao WS		1	1		50	50		295	295
		Cubcuba WS		1	1		15	15		89	89
		Dulao WS		1	1		30	30		177	177
		Duldulao WS		1	1		50	50		295	295
		Gacab WS		1	1		60	60		354	354
		Malibcong WS		1	1		60	60		354	354
		Manapnap WS		1	1		15	15		89	89
		Matahibeng WS		1	1		20	20		118	118
		Mataragan WS		1	1		30	30		177	177
		Pacqued WS		1	1		40	40		236	236
		Taripen WS		1	1		40	40		236	236
		Umnay WS		1	1		30	30		177	177
		<b>Municipal Total</b>		14	14	0	482	482	0	2,845	2,845
010116	Manabo	Ayyeng WS	1		1	65		65	338		338
		Banat WS		1	1		50	50		255	255
		Catacdegan WS		2	2		80	80		408	408
		Liagan WS	1		1	75		75	390		390
		Luzong WS	1		1	90		90	468		468
		Madago WS		1	1		50	50		255	255
		San Juan WS		2	2		100	100		510	510
		Sn. Jose WS		2	2		80	80		408	408
		Sto. Tomas WS		1	1		35	35		179	179
		Villa Conchita W.S.A		1	1		40	40		204	204
		<b>Municipal Total</b>	3	10	13	230	435	665	1,196	2,219	3,415
010117	Penarrubia	Lusuac WS	1	5	6	40	140	180	220	784	1,004
010118	Pidigan	Inmul WS		1	1		20	20		110	110
		Malobloto & Tambo WS	2	2	4	175	75	250	980	413	1,393
		Pangtod WS		1	1		18	18		99	99
		Suyo WS		1	1		20	20		110	110
		<b>Municipal Total</b>	2	5	7	175	133	308	980	732	1,712
010119	Pilar	Nageawasan WS		1	1		30	30		159	159
		Narnara WS		1	1		30	30		159	159
		Ocop WS		1	1		30	30		159	159
		Palicao WS	1		1	25		25	138		138
		San Juan WS		1	1		30	30		159	159
		<b>Municipal Total</b>	1	4	5	25	120	145	138	636	774

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

Sheet 2

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Number of Barangays Served			Number of Households Served			Number of Population Served		
			Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
010120	Sallapadan	Bazar WS		1	1		100	100		550	550
		Bilabila WS		1	1		50	50		275	275
		Gangal WS	1		1	60		60	330		330
		Maguyepyp WS		1	1		60	60		330	330
		Naguilian WS		1	1		75	75		413	413
		Sacaang WS		1	1		75	75		413	413
		Sallapadan WS		1	1		40	40		220	220
		Subsub WSA	1		1	60		60	330		330
		Ud-udiao WS		1	1		75	75		413	413
		<b>Municipal Total</b>	2	7	9	120	475	595	660	2,614	3,274
010121	San Isidro	Sn Isidro WS	1	2	3	40	60	100	240	330	570
010122	San Juan	Poblacion WS	2		2	45		45	216		216
010123	San Quintin	Carsuan WS		1	1		15	15		75	75
		Labaan WS		1	1		10	10		50	50
		Palang WS		1	1		25	25		125	125
		Pantoc WS		1	1		103	103		515	515
		Poblacion WS	1		1	50		50	260		260
		Talaytay WS		1	1		10	10		50	50
		Tangadan WS		1	1		155	155		775	775
		Villa Mercedes WS		1	1		15	15		75	75
		<b>Municipal Total</b>	1	7	8	50	333	383	260	1,665	1,925
010124	Tayum	Basbasa WS		1	1		50	50		285	285
		Budac WS		1	1		100	100		570	570
		Gaddani WS		1	1		100	100		570	570
		Velasco WS		2	2		110	110		627	627
		<b>Municipal Total</b>	0	5	5	0	360	360	0	2,052	2,052
010125	Tineg	Agsumao WS		1	1		60	60		324	324
		Alada WS		1	1		20	20		108	108
		Apao WS		1	1		20	20		108	108
		Caganayan WS		1	1		50	50		270	270
		Cogon WS		1	1		25	25		135	135
		Lanec WS		1	1		25	25		135	135
		Lapat-Balanay WS		1	1		25	25		135	135
		<b>Municipal Total</b>	0	7	7	0	225	225	0	1,215	1,215
010126	Tubo	Alangin WS		1	1		50	50		275	275
		Antuagan WS		1	1		55	55		303	303
		Aputan WS		1	1		16	16		88	88
		Baclingayan WS		1	1		34	34		187	187
		Bana WS		1	1		18	18		99	99
		Kili-tubo WS		1	1		28	28		154	154
		Tabatab WS		1	1		35	35		193	193
		Tiempo WS		1	1		40	40		220	220
		<b>Municipal Total</b>	0	8	8	0	276	276	0	1,519	1,519
010127	Villavieja	Bohilising WS		1	1		20	20		106	106
		Cafao WS		1	1		75	75		398	398
		Laplapog WS		1	1		100	100		530	530
		Lumaba WS		2	2		100	100		530	530
		Poblacion WS	1		1	100		100	520		520
		Talamac WS		1	1		60	60		318	318
		Tuquib WS		1	1		132	132		700	700
		<b>Municipal Total</b>	1	7	8	100	487	587	520	2,582	3,102
<b>Provincial Total</b>			20	138	158	1,200	5,792	6,992	6,434	31,628	38,062

Table 4.1.2 Existing Level II Systems

Sheet 3

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Service Conditions During Dry Season									Supply Water Pressure (% of Total)	
			Supply (Hrs/day)	Dirty Water <sup>1</sup>	Taste or Smell <sup>2</sup>	Power Failure	Supply Interruption (number/month)	Pump Breakdown	Pipe Burst	Others	Adequate	Inadequate	
010101	Bangued (Capital)	Angad W.S.	24									90%	10%
		Lingnan W.S.										75%	25%
		Macarcamay W.S.										75%	25%
		Maoy W.S.										75%	25%
		Palao W.S.										60%	40%
		Sao-Atan W.S.										75%	25%
		Municipal Total											
010103	Bucay	Abang BWSA	24										
		Bangbangcag BWSA											
		Bangloloao DWSI											
		Bucay WS											
		Bugbog BWSA											
		Calao BWSA											
		Dugong BWSA											
		Labon BWSA											
		Layugan BWSA											
		Madalipay BWSA											
		Pakling BWSA											
		Palaquio BWSA											
		Quimloong WSA											
		Salnec BWSA											
010104	Bucloc	Siblong BWSA	24										
		Tabiog WSA											
		Municipal Total											
		Dueligan WS		O	G					2			
		Labaan WS		O	G					2			
		Lamao WS		O	G					2			
		Lingey WS	8		G						75%	25%	
010105	Daguioman	Municipal Total											
		Tui WS	24	O								75%	25%
		Piker WS	24		G							90%	10%
		Cabaruyan WS	24		G							90%	10%
		Ableg WS	24	O								90%	10%
		Municipal Total											

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

Sheet 3

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Service Conditions During Dry Season							Supply Water Pressure (% of Total)	
			Supply (Hrs/day)	Dirty Water <sup>1</sup>	Taste or Smell <sup>2</sup>	Power Failure	Pump Breakdown	Pipe Burst	Others		
010106	Danglas	Caburan WS	6							75%	25%
		Caupasan WSA	24							75%	25%
		Danglas WSA	24		G					75%	25%
		Domeguay WSA	6	2W	W			2		75%	25%
		Municipal Total									
010107	Dolores	Bayaan WS	24								
		Kimmalaba WS	5								
		Namit-ingan WS									
		Taping WS	24								
		Municipal Total									
010108	Lacub	Bacag WS		O	G			1			
		Balagang WS		O	G			1			
		Bureg WS		O	G			1			
		Pacoc WS	24	O	G			1			
		Poblacion WS	16	O	G			1			
10110	Lagayan	Sap-al WS			G						
		Municipal Total									
		Calambat									
		Collago WS									
		Municipal Total									
010111	Langiden	Baac WS		O	G					100%	0%
		Poblacion WS			G					100%	0%
		Quilat WS	3								
		Municipal Total									
		Leneng WS	24		G						
010113	Lucuan	Mogao WS	24		G			1		95%	5%
		Walburn-Subagan WS	24					1			
		Municipal Total									
		Ampaliok WS			G						
		Barit WS	24		G						
010114	Luba	Gavanan WS	24		G						
		Lul-luno WS			G						

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

Sheet 3

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Supply (Hrs/day)	Dirty Water <sup>1</sup>	Taste or Smell <sup>2</sup>	Service Conditions During Dry Season					Supply Water Pressure (% of Total)	
						Power Failure	Pump Breakdown	Pipe Burst	Others	Adequate	Inadequate	
010114	Luba	Naguquipa WS			G							
		Pega WS	24		G							
010115	Malibcong	Municipal Total										
		Adugao WS										
		Bayabas WS										
		Buanao WS										
		Cubcuba WS										
		Dulao WS										
		Duldulao WS										
		Gacab WS										
		Malibcong WS										
		Mananap WS										
		Matalibeng WS										
		Mataragan WS										
		Pacued WS										
		Tarpan WS										
010116	Manabo	Umnap WS										
		Municipal Total										
		Ayyeng WS	24									
		Banat WS	24									
		Catacdogan WS								98%		2%
		Liagan WS										
		Luzong WS	12									
		Madago WS										
		San Juan WS										
		Sn. Jose WS	24									
		Sto. Tomas WS	24									
		Villa Conchita WS Association										
		Municipal Total										
010117	Penarrubia	Lusac WS		2M								
		Inmuli WS										
010118	Pidigan	Malobobo & Tambo WS										
		Pangtod WS										

Table 4.1.2 Existing Level II Systems

Sheet 3

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Service Conditions During Dry Season							Supply Water Pressure (% of Total)	
			Supply (Hrs/day)	Dirty Water <sup>1</sup>	Taste or Smell <sup>2</sup>	Power Failure	Pump Breakdown	Pipe Burst	Others		
010118	Pidigan	Suyo WS						0			
		<b>Municipal Total</b>									
010119	Pilar	Nagawasan WS			G						
		Namara WS			G						
		Ocop WS									
		Palicao WS			G						
		San Juan WS									
		<b>Municipal Total</b>									
010120	Sal-lapadan	Bazar WS	24								
		Bilabila WS	24								
		Gangal WS	24								
		Maguyep WS	24								
		Naguilian WS	24								
		Sacaang WS	24								
		Salapadan WS	24								
		Subsub WSA	24								
		Ud-udiao WS	24								
		<b>Municipal Total</b>									
010121	San Isidro	So Isidro WS	24				4				
010122	San Juan	Poblacion WS	24								
010123	San Quintin	Carsuan WS									
		Labuan WS									
		Palang WS									
		Pantoc WS									
		Poblacion WS									
		Talayray WS									
		Tangadan WS									
		Villa Mercedes WS									
		<b>Municipal Total</b>									
010124	Tayum	Barbasa WS									
		Budac WS									
		Gaddani WS		O				1			
		Velasco WS	24								
		<b>Municipal Total</b>									



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

Sheet 3

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Supply (Hrs/day)	Dirty Water <sup>1</sup>	Taste or Smell <sup>2</sup>	Service Conditions During Dry Season					Supply Water Pressure (% of Total)	
						Power Failure	Pump Breakdown	Pipe Burst	Others	Adequate	Inadequate	
010125	Tineg	Agsumao WS	24		G					30%	70%	
		Alada WS		E	M			4		50%	50%	
		Apao WS						4		50%	50%	
		Caganayan WS	24	O	G			2		10%	90%	
		Cogon WS		O		5				50%	50%	
		Lance WS	24	O						50%	50%	
		Lapat-Balanay WS						5		90%	10%	
		<b>Municipal Total</b>										
010126	Tubo	Antuagan WS	24									
		Alangin WS	24									
		Apatan WS										
		Bacilingan WS	24									
		Bana WS										
		Kili-tubo WS	24									
		Tabatab WS										
		<b>Municipal Total</b>	24									
010127	Villavieja	Municipal Total	120									
		Bollising WS	24	OM	O			1		75%	25%	
		Calao WS	24	OM	M			1		75%	25%	
		Laplalog WS	12	OM	O	1						
		Lumaba WS		O	M			3		30%	70%	
		Poblacion WS	8	OM	M					75%	25%	
		Talamac WS										
		<b>Municipal Total</b>	24	OW	M			1		75%	25%	
		<b>Provincial Total</b>										

Note: 1. Dirty Water: E - Everyday, OW - Once a week, OM - Once a month, O - Occasional.  
 2. Taste/Smell: G - Good taste, S - Salty, W - Wood taste, M - Metallic taste, O - Others.

Table 4.1.2 Existing Level II Systems

Sheet 4

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Number of Staff						
			Technical Professional	Adminis- trative Staff	Collector	Total Number of Staff	Repair Work		
							Local Tradesman	MEO/C EO	DEO
010101	Bangued (Capital)	Angad W.S.					x		
		Lingtan W.S.					x		
		Macarcamay W.S.					x		
		Maoy W.S.					x		
		Palao W.S.					x		
		Soo-Atan W.S.					x		
		<b>Municipal Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>			
010103	Bucay	Abang BWSA		3	1	4	x		
		Bangbangcag BWSA		3	1	4	x		
		Banglolo WSI			1	11	x		
		Bucay WS			1	5	x		
		Bugbog BWSA			1	11	x		
		Calao BWSA			1	5	x		
		Dugong BWSA			1	10	x		
		Labon BWSA			1	10	x		
		Layugan BWSA			0	5	x		
		Madalipay BWSA			1	5	x		
		Pakiling BWSA			0	4	x		
		Palauio BWSA			0	*	x		
		Quimloong WSA			1	4	x		
		Salnec BWSA			1	5	x		
		Siblong BWSA			1	5	x		
		Talio WSA			1	5	x		
		<b>Municipal Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>			
010104	Bucloc	Ducigan WS				*	x		
		Labuan WS				*	x		
		Lamao WS				*	x		
		Lingey WS				*	x		
		<b>Municipal Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>			
010105	Daguioan	Ableg WS				*	x		
		Cabaruan WS				*	x		
		Piker WS				*	x		
		Tui WS				*	x		
		<b>Municipal Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>			
010106	Danglas	Cabaruan WS					x		
		Caupasan WSA		5	1	6	x		
		Danglas WSA					x		
		Domeguiay WSA			1	1	x		
		<b>Municipal Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>			
010107	Dolores	Bayaan WS					x		
		Kimulaba WS					x		
		Namit-ingan WS					x		
		Taping WS					x		
		<b>Municipal Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>			
010108	Iacub	Bacag WS					x		
		Balogang WS					x		
		Buneg WS					x		
		Pacoc WS					x		
		Poblacion WS					x		
		Salal WS					x		
		<b>Municipal Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>			
010110	Lagayan	Calambat					x		
		Collago WS					x		
		<b>Municipal Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>			

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

Sheet 4

NEOA Geo- graphic Code	Municipality	Name of System (Operating Body)	Number of Staff						Repair Work		
			Technical Professional	Adminis- trative Staff	Collector	Total Number of Staff			Local Tradesman	MEO/C EO	DEO
010111	Langiden	Baac WS							x		
		Poblacion WS							x		
		Quillat WS								x	
		Municipal Total	NA	NA	NA	NA					
010113	Licuan	Lenneng WS							x		
		Mogao WS							x		
		Walbuan-Subagan WS							x		
		Municipal Total	NA	NA	NA	NA					
010114	Laliba	Ampalick WS							x		
		Barit WS							x		
		Gayaman WS							x		
		Lul-luno WS							x		
		Nagtuquipa WS							x		
		Pega WS							x		
		Municipal Total	NA	NA	NA	NA					
010115	Malibcong	Adugao WS							x		
		Bayabas WS							x		
		Buanao WS							x		
		Cubcuba WS							x		
		Dulao WS							x		
		Duldulao WS							x		
		Gacab WS							x		
		Malibcong WS							x		
		Manapnap WS							x		
		Matalibeng WS							x		
		Mataragan WS							x		
		Pacqed WS							x		
		Taripan WS							x		
		Umnap WS							x		
		Municipal Total	NA	NA	NA	NA					
010116	Manobo	Ayyeng WS	2	2			4		x		
		Banat WS					0		x		
		Catacdegan WS					0		x		
		Liagan WS					0		x		
		Luzong WS	2	2	1	5			x		
		Madago WS					0		x		
		San Juan WS					0		x		
		St. Jose WS					0		x		
		Sto. Tomas WS					0		x		
		Villa Conchita WS Asso.					0		x		
		Municipal Total	NA	NA	NA	NA					
010117	Penarrubia	Lusuac WS		2	1	3			x		
010118	Pidigan	Imamuli WS							x		
		Maloblobo & Tambo WS			3					x	
		Pangtod WS							x		
		Suyo WS							x		
		Municipal Total	NA	NA	NA	NA					
010119	Pilar	Nagrawasan WS							x		
		Narnara WS							x		
		Ocop WS							x		
		Palicao WS							x		
		San Juan WS							x		
		Municipal Total	NA	NA	NA	NA					

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

Sheet 4

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Number of Staff						
			Technical Professional	Adminis- trative Staff	Collector	Total Number of Staff	Repair Work		
							Local Tradesman	MEQC EO	DEO
010120	Sallapadan	Bazar WS					x		
		Bilabila WS					x		
		Gangal WS					x		
		Maguyepyp WS					x		
		Naguilan WS					x		
		Sacang WS					x		
		Sallapadan WS					x		
		Subsub WSA					x		
		Ud-udiao WS					x		
		<b>Municipal Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>			
010121	San Isidro	Sn Isidro WS					x		
010122	San Juan	Poblacion WS					x		
010123	San Quintin	Carsona WS					x		
		Labnan WS					x		
		Palang WS					x		
		Pantoc WS					x		
		Poblacion WS					x		
		Talaytay WS					x		
		Tangadan WS					x		
		Villa Mercedes WS					x		
		<b>Municipal Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>			
010124	Fayum	Basbosa WS					x		
		Budac WS					x		
		Gaddani WS					x		
		Velasco WS					x		
		<b>Municipal Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>			
010125	Tineg	Agsimao WS					x		
		Alada WS					x		
		Apao WS					x		
		Caganayan WS					x		
		Cogon WS					x		
		Lance WS					x		
		Lapat-Balantay WS					x		
		<b>Municipal Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>			
010126	Tubo	Alangtin WS					x		
		Amtuagan WS					x		
		Apotan WS					x		
		Baclingayan WS					x		
		Bana WS					x		
		Kiti-tubo WS					x		
		Tabatab WS					x		
		Tiempo WS					x		
		<b>Municipal Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>			
010127	Vallaviciosa	Bollitising WS					x		
		Calao WS					x		
		Laplalog WS			2		x		
		Lumaba WS				2	x		
		Poblacion WS					x		
		Talamac WS					x		
		Tuquib WS					x		
		<b>Municipal Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>			
<b>Provincial Total</b>			<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>			

Note : \* - Barangay Officials

Table 4.1.2 Existing Level II Systems

Sheet 5

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Expenditures					Tariff					Average Collection Efficiency (%)		
			Annual	Wages	Fuel, Chem. Mat'l.	Transport	Repairs	Loan Repayment	Other	Consumer Payment	Cost per Cubic Meter	Cost Per Household		Other	
															(Thousand of Pesos/year)
010101	Bangued (Capital)	Angad W.S.													
		Lingnan W.S.													
		Macarcamay W.S.													
		Macay W.S.													
		Palao W.S.													
		Sao-Atan W.S.													
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	
		Abang BWSA	1										2.00		
		Bangbangag BWSA	0												
		Banglao DWST	2										1.00		100%
010103	Bucay	Bucay WS	100										5.00	10.00	70%
		Bugbog BWSA	0										2.00		
		Calao BWSA	2												
		Dugong BWSA	0										5.00		
		Labon BWSA	5										5.00		90%
		Lavagan BWSA	2												
		Madalipay BWSA	3										2.00		95%
		Pakling BWSA	0												
		Palaoque BWSA	5												
		Qurimlong WSA	0										2.00		90%
010104	Bucloc	Salnec BWSA	10										2.00		95%
		Siblong BWSA	1												
		Tabiog WSA	0										1.00		100%
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
		Dueligan WS													
		Labaan WS													
		Lamao WS													
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
		Ableg WS													
		010105	Daguoman	Cabanyan WS											
Piker WS															
Tui WS															
Municipal Total	N.A.			N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

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

Sheet 5

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Expenditures					Tariff					Average Collection Efficiency (%)		
			Annual	Wages	Fuel, Chem, Mat'l	Transport	Repairs	Loan Repayment	Other	Consumer Payment (Year)	Cost per Pail	Cost per Cubic Meter		Cost Per Household	Other
010106	Danglas	Cabaruan WS													
		Caupusan WSA	12						2	8.00			24		50%
		Danglas WSA					2								
		Doneguay WSA								4.32			16		90%
		Municipal Total	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
010107	Dolores	Bayaan WS											2		
		Kimmalaba WS											0		
		Namit-igan WS													
		Taping WS											0		
		Municipal Total	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
010108	Lacub	Bacag WS													
		Balagang WS													
		Buneg WS													
		Pacoc WS													
		Poblacion WS													
		Sal-al WS													
		Municipal Total	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
010110	Lagayan	Calambat													
		Collago WS													
		Municipal Total	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
010111	Langiden	Baac WS					0.15								
		Poblacion WS					0.50								
		Quillat WS													
		Municipal Total	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
010113	Licuan	Lenneng WS													
		Mogao WS													
		Walbuon-Subagan WS													
		Municipal Total	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
010114	Luba	Ampalok WS													
		Bant WS													
		Ganyaman WS													
		Lul-luno WS													

Sheet 5.

4 - 21

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

Sheet 5

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Expenditures (Thousand of Pesos/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 Cubic Meter		Cost Per Household	Other	
010118	Pdigan	Immul WS														
		Malobobo & Tambo WS											5.00			70%
		Pangrod WS														
		Soyo WS														
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
010119	Pilar	Nagawasan WS														
		Narnara WS														
		Ocop WS														
		Palicao WS														
		San Juan WS														
010120	Sal-lapadan	Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
		Bazar WS														
		Bitabla WS														
		Gangal WS														
		Maguyepcep WS														
010121	San Isidro	Naguilan WS														
		Sacaang WS														
		Sallapadan WS														
		Subsub WSA														
		Ud-udiao WS														
010122	San Juan	Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
		Sn Isidro WS														
		Poblacion WS														
		Corunan WS														
		Labuan WS														
010123	San Quintin	Palang WS														
		Pantoc WS														
		Poblacion WS														
		Talayay WS														
		Tungadan WS														
010124	Villa Mercedes	Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.



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

Sheet 5

Sheet 2

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Expenditures					Tariff					Average Collection Efficiency (%)		
			Annual	Wages	Fuel, Chem, Mat'l.	Transport	Repairs	Loan Repayment	Other	Consumer Payment (Year)	Cost per Pail	Cost per Cubic Meter		Cost Per Household	Other
010124	Tayum	Sabasa WS													
		Budac WS													
		Gaddani WS													
		Velasco WS													
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
010125	Tineg	Agsumao WS													
		Alada WS													
		Ayao WS													
		Caganayan WS													
		Cogon WS													
		Lanac WS													
		Lapat-Balanay WS													
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
010126	Tubo	Alangin WS													
		Amuagan WS													
		Apatan WS													
		Bacilingayan WS													
		Bana WS													
		Kili-rubio WS													
		Tabatab WS													
		Tiempo WS													
	Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	
010127	Villavieja	Bollising WS													
		Calao WS											0.50		
		Laplago WS													
		Lumaba WS													
		Poblacion WS													
		Talamac WS													
		Tuquib WS													
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Provincial Total			N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Table 4.1.2 Existing Level II Systems

Sheet 6

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Billings					Revenues				
			Annual Billing (Number)	Public Faucet Consumers	House Connection Consumers	Expected Subsidies	Others	Annual Income	Payment by Public Faucet Consumers	Payment by House Connection Consumer	Subsidies	Others
010101	Bangued (Capital)	Angad W.S										
		Lingnan W.S										
		Macarimay W.S										
		Maay W.S										
		Palao W.S										
		Sao-Alan W.S										
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
010103	Bucay	Abang BWSA										
		Bangbang BWSA										
		Banglao DWSI										
		Bucay W.S										
		Bugbog BWSA										
		Calao BWSA										
		Dugong BWSA										
		Labon BWSA										
		Layugan BWSA										
		Madalipay BWSA										
		Paloling BWSA										
		Palauito BWSA										
		Quimboing WSA										
010104	Bucloc	Sainet BWSA										
		Sinlong BWSA										
		Tablog WSA										
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
		Ducigan WS										
		Labuan WS										
		Lamao WS										
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
010105	Daguoman	Ableg WS										
		Cabatuan WS										
		Piket WS										
		Tui WS										
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

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

Sheet 6

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Billings					Revenues				
			Annual Billing	Public Faucet Consumers	House Connection Consumers	Expected Subsidies	Others	Annual Income	Payment by Public Faucet Consumers	Payment by House Connection Consumer	Subsidies	Others
			(Thousand of Pesos/year)									
010106	Danglas	Cabaruan WS										
		Caupasan WSA										
		Danglas WSA										
		Domeguay WSA										
010107	Dolores	Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
		Bayaan WS										
		Kimmalaba WS										
		Namitcingan WS										
		Taping WS										
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
010108	Lucab	Bacag WS										
		Balagang WS										
		Bureg WS										
		Paceo WS										
		Poblacion WS										
		Sal-al WS										
010110	Lagayan	Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
		Calambat										
		Collago WS										
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
010111	Langiden	Baac WS										
		Poblacion WS										
		Quilat WS										
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
010113	Licuan	Lemeng WS										
		Mogao WS										
		Walbuan-Subagan WS										
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
010114	Luba	Ampaliok WS										
		Bart WS										
		Gavaman WS										
		Lul-luno WS										
		Nagtuqupa WS										

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

Sheet 6

NEZA Geo- graphic Code	Municipality	Name of System (Operating Body)	Billings						Revenues			
			Annual Billing	Public Faucet Consumers	House Connection Consumers	Expected Subsidies	Others	Annual Income	Payment by Public Faucet Consumers	Payment by House Connection Consumer	Subsidies	Others
			(Number)									
01014	Loba	Pega WS										
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
01015	Malibcong	Adugao WS										
		Bayabas WS										
		Buanao WS										
		Cubaba WS										
		Dulao WS										
		Duldulao WS										
		Gacab WS										
		Malibcong WS										
		Mananap WS										
		Matibeng WS										
		Matagan WS										
		Pacquet WS										
		Tanpan WS										
01016	Manabo	Umap WS										
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
		Ayeng WS										
		Banat WS										
		Catodegan WS										
		Luagan WS										
		Luzong WS										
		Madago WS										
		San Juan WS										
		Sn. Jose WS										
		Sto. Tomas WS										
		Villa Conchita WS Asso.										
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
01017 01018	Pinarubin	Lusuac WS										
	Pidigan	Matlelobo & Tombo WS										
		Immuli WS										
		Pungod WS										
		Suyo WS										
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

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

Sheet 6

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Billings					Revenues					
			Annual Billing (Number)	Public Faucet Consumers	House Connection Consumers	Expected Subsidies	Others	Annual Income	Payment by Public Faucet Consumers	Payment by House Connection Consumer	Subsidies	Others	
(Thousand of Pesos/year)													
010119	Pilar	Nagawasan WS											
		Namara WS											
		Ocop WS											
		Palacio WS											
		San Juan WS											
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	
010120	Sal-lapadan	Bazar WS											
		Bilabilla WS											
		Gangal WS											
		Maeuyevsep WS											
		Naguilian WS											
		Sacaang WS											
		Sallapadan WS											
		Subsub WSA											
		Ud-udiao WS											
			Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
010121	San Isidro	Sn Isidro WS											
010122	San Juan	Poblacion WS											
010123	San Quintun	Carson WS											
		Labuan WS											
		Palang WS											
		Pantoc WS											
		Poblacion WS											
		Talayay WS											
		Tangadan WS											
		Villa Mercedes WS											
	Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.		
010124	Tayum	Barbasco WS											
		Budac WS											
		Gaddani WS											
		Velasco WS											
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	

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

Sheet 6

NEDA Geo- graphic Code	Municipality	Name of System (Operating Body)	Billings				Revenues						
			Annual Billing	Public Faucet Consumers	House Connection Consumers	Expected Subsidies	Others	Annual Income	Payment by Public Faucet Consumers	Payment by House Connection Consumer	Subsidies	Others	
(Thousand of Pesos/year)													
010125	Tineg	Agsumao WS											
		Alada WS											
		Apao WS											
		Caganayan WS											
		Cogon WS											
		Lance WS											
		Lapas-Balanay WS											
		Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
010126	Tubo	Alangun WS											
		Amnagan WS											
		Apatan WS											
		Bacilingayan WS											
		Bana WS											
		Kili-tubo WS											
		Tabatab WS											
		Tiempo WS											
010127	Villavieja	Municipal Total	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
		Bollising WS											
		Calao WS											
		Laplalog WS											
		Lumaba WS											
		Poblacion WS											
		Talamac WS											
		Tuquib WS											
Municipal Total		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	
Provincial Total		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	