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

YOLUME III - 9

SUPPORTING AND DATA REPORT

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

NUEVA VIZCAYA



FEBRUARY 1996

NIPPON JOGESUIDO SEKKEI CO., LTD.

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PROVINCIAL WATER SUPPLY, SEWERAGE AND SANITATION SECTOR PLAN

VOLUME HI - 9 SUPPORTING AND DATA REPORT

TABLE OF CONTENTS

CHA	APTER	PAGE NO.
	r of tables r of figures	iv vii
SUF	PPORTING REPORT	
A.	BACKGROUND INFORMATION AND EXISTING CONDITIONS	
1.	INTRODUCTION	
1.3	The Provincial Plan for the Province of Nueva Vizcaya 1.3.1 Preparation of the Plan	1 - 1 1 - 1
2.	PLANNING APPROACH FOR FUTURE SECTOR DEVELOPMENT	
2.6	Planning Principles and Data Management 2.6.2 Data Management	2 - 1 2 - 1
3.	PROVINCIAL PROFILE	
3.3	Socio-economic Conditions 3.3.1 Economic Activities and Household Income 3.3.3 Education	3 - 1 3 - 1 3 - 3
3.4	Population 3.4.2 Classification of Urban and Rural Areas Health Status	3 - 4 3 - 4 3 - 5
3.6	3.5.3 Health Facilities and Practitioners	3 - 5 3 - 6 3 - 6
4.	EXISTING FACILITIES AND SERVICE COVERAGE	
4.1	Water Supply 4.1.3 Level III Systems 4.1.4 Level II Systems 4.1.5 Level I Facilities 4.1.6 Water Supply Service Coverage	4-1 4-1 4-2 4-22 4-22
4.2	Sanitation and Sewerage 4.2.2 Types of Facilities and Definition of Service Level Standard 4.2.3 Sanitation Facilities and Service Coverage	4 - 32 4 - 32 4 - 34

CHA	PTER	PAGE NO.
5.	EXISTING SECTOR ARRANGEMENTS AND INSTITUTIONAL CAPACITY	
5.5	Sector Agencies at the Local Level	5 - 1
6.	PAST FINANCIAL PERFORMANCE IN WATER SUPPLY AND SANITATION	
6.2	Past Public Investment	6 - 1
7.	WATER SOURCE DEVELOPMENT	
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	FUTURE REQUIREMENTS AND DEVELOPMENT PLAN	
8.	FUTURE REQUIREMENTS IN WATER SUPPLY AND	
	SANITATION IMPROVEMENT	
8.2	Targets of Provincial Sector Plan	8 - 1
8.3	Projection of Frame Values	8 - 8
7.	8.3.1 Review of Past Population Development and Population Projection	8 - 8
	8.3.2 School Enrollment Projection	8 - 13
	8.3.3 Projection of the Number of Public Utilities	8 - 14
8.4	Types of Facilities and Implementation Criteria	8 - 15
	8.4.1 Water Supply	8 - 15
	8.4.3 Urban Sewerage	8 - 16
8.5	Service Coverage by Target Year	8 - 17
	8.5.1 Water Supply	8 - 17
: 1	8.5.2 Sanitation	8 - 21
8,6	Facilities, Equipment and Rehabilitation Required to Meet the	10.00
	Target Services	8 - 25
	8.6.1 Water Supply	8 - 25 8 - 30
	8.6.2 Sanitation	0 - 30
9.	SECTOR MANAGEMENT PLAN	
9.4	Project Management Arrangements	9 - 1
9.5	Community Development Model	9 - 20
10.	COST ESTIMATES FOR FUTURE SECTOR DEVELOPMENT	
10.2	Assumptions for Cost Estimates	10 - 1
	10.2.1 Unit Construction Cost	10 - 1
	10.2.2 Unit Cost of Equipment	10 - 25
	Cost of Required Facilities and Equipment	10 - 27
	10.3.1 Cost of Required Facilities	10 - 27
10.4	Costs of Sector Management	10 - 31
	10.4.1 Breakdown of Community Development and Training Cost	10 - 31

PAGE	NO
------	----

718		P	Е	R

PTER	PAGE NO.
SECTOR IMPLEMENTATION ARRANGEMENTS	
FINANCIAL ARRANGEMENTS	
Additional Funding Requirements Medium-Term Implementation Arrangements 11.4.2 Alternative Countermeasures	11 - 1 11 - 2 11 - 2
MONITORING	
Evaluation of Plan Implementation and Updating the PW4SP	12 - 1
'A REPORT	
INTRODUCTION	
The Provincial Plan for the Province of Nueva Vizcaya 1.3.2 Outline of the Report Acknowledgments	1 - 1 1 - 1 1 - 3
PLANNING APPROACH FOR FUTURE SECTOR DEVELOPMENT	
Planning Principles and Data Management 2.6.1 Planning Principles 2.6.2 Data Management 2.6.2.1 Questionnaire Forms 2.6.2.2 Definition of Terms 2.6.2.3 User's Guide for Computer-Aided Planning	2 - 1 2 - 1 2 - 29 2 - 29 2 - 94 2 - 10
PROVINCIAL PROFILE	
Natural Conditions and Geographical Features 3.2.3 Topography and Drainage Socio-economic Conditions 3.3.2 Basic Infrastructure Health Status 3.5.1 Morbidity, Mortality and Infant Mortality 3.5.3 Health Facilities and Practitioners	3-1 3-1 3-3 3-3 3-4 3-4
Environmental Conditions 3.6.3 Solid Waste Disposal	3 - 6 3 - 6
EXISTING FACILITIES AND SERVICE COVERAGE	
Sanitation and Sewerage 4.2.3 Sanitation Facilities and Service Coverage	4 - 1 4 - 1
WATER SOURCE DEVELOPMENT	
General Groundwater Sources 7.3.2 Groundwater Availability in the Province Surface Water Sources Future Development Potential of Water Sources	7 - 1 7 - 10 7 - 10 7 - 16 7 - 18
	Additional Funding Requirements Medium-Term Implementation Arrangements 11.4.2 Alternative Countermeasures MONITORING Evaluation of Plan Implementation and Updating the PW4SP A REPORT INTRODUCTION The Provincial Plan for the Province of Nueva Vizcaya 1.3.2 Outline of the Report Acknowledgments PLANNING APPROACH FOR FUTURE SECTOR DEVELOPMENT Planning Principles and Data Management 2.6.1 Planning Principles 2.6.2 Data Management 2.6.2.1 Questionnaire Forms 2.6.2.2 Definition of Terms 2.6.2.3 User's Guide for Computer-Aided Planning PROVINCIAL PROFILE Natural Conditions and Geographical Features 3.2.3 Topography and Drainage Socio-economic Conditions 3.3.2 Basic Infrastructure Health Status 3.5.1 Morbidity, Mortality and Infant Mortality 3.5.3 Health Facilities and Practitioners Environmental Conditions 3.6.3 Solid Waste Disposal EXISTING FACILITIES AND SERVICE COVERAGE Samitation and Sewerage 4.2.3 Sanitation Facilities and Service Coverage WATER SOURCE DEVELOPMENT General Groundwater Sources 7.3.2 Groundwater Availability in the Province Surface Water Sources

PROVINCIAL WATER SUPPLY, SEWERAGE AND SANITATION SECTOR PLAN

LIST OF TABLES

Table No.	Title	Page No
SUPPORTIN	G REPORT	
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	
2.0	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 - 2
the state of the s	Number of Level I Facilities by Safe and Unsafe Classification	4 - 23
4.1.3 4.1.4	Estimation of Unserved Population by Municipality	4 - 26
4.1.5	Estimation of Population Covered by Safe and Unsafe	. 4 - 20
4,1.3	Source by Municipality	4 - 28
4.2.1	Sanitation Facilities and Service Coverage of Household	1 20
4.2.1	Toilets by Type, by Municipality, Urban and Rural, 1995	4 - 34
(21	De la Februaria Decessiona Albertonata a Manifestalitica in Nicora	
6.2.1	Past Internal Revenue Allotment to Municipalities in Nueva	6 - 1
	Vizcaya Province in 1990-1994	0-1
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
7.0.5	Standard operation of world by manicipality	
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 - 2
8.2.3	Number of Households Served by Sanitary Toilets in the	
	Base Year (1995)	8 - 3
	·	

Table No.	Title	Page No.	
8.2.4	Number of Public School Students Served by School Toilets		
0.2.4	in Base Year (1995)	8 - 4	
8.2.5	Number of Public Utilities with Sanitary Toilets in the		
0.2.5	Base Year (1995)	8 - 5	
8.2.6	Households Coverage in Phase I Provided by Existing Facilities		
0.2.0	in the Base Year (Household Toilets)	8 - 6	
8.2.7	Public School Students and Public Utilities Coverage in Phase I		
0.2.7	Provided by Existing Facilities in the Base Year	8 - 7	
8.3.1	Past Population Development	8 - 8	
8.3.2	Population Distribution in Urban and Rural Areas	8 - 9	
8.3.3	Growth Rates and Population Projection for Target Years:		
0.5.2	Region and Province	8 - 11	
8.3.4	Provincial Population for Target Years	8 - 11	
8.3.5	Projected Number of Households by Urban and Rural Area		
0.5.5	by Municipality by Target Year	8 - 12	
8.3.6	Projected School Enrollment by Municipality by Target Year	8 - 13	
8.3.7	Projected Number of Public Utilities by Municipality by		
0.5.7	Target Year	8 - 14	
8.5.1	Potential Population to be Served by Level II System in Phase I	8 - 17	
8.5.2	Population to be Served in Phase I (Water Supply)	8 - 19	
8.5.3	Population to be Served in Phase II (Water Supply)	8 - 20	
8.5.4	Additional Number of Households to be Served in Phase I		
0.5.4	(Household Toilets)	8 - 21	
8.5.5	Additional Number of Households to be Served in Phase II		
0	(Household Toilets)	8 - 22	
8.5.6	Additional Number of Public School Students to be Served		
0.7.0	in Phases I and II (School Toilets)	8 - 23	
8.5.7	Number of Public Utilities with Sanitary Toilets		
0.5.7	in Phases I and II	8 - 24	
8.6.1	Urban Water Supply Facilities Required by Target Year	8 - 26	
8.6.2	Plan for Expansion of Existing Level III System	8 - 27	
8.6.3	Rural Water Supply Facilities Required by Target Year	8 - 28	
8.6.4	Urban Household Toilets Required by Target Year	8 - 30	
8.6.5	Rural Household Toilets Required by Target Year	8 - 31	
8.6.6	Public School Toilets Required by Target Year	8 - 32	
8.6.7	Public Toilets Required by Target Year	8 - 33	
9.4.1	Format for Level I Project Data	9 - i	
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 II (600 Service Population)	10 - 6	
10.2.7	Unit Cost of Level III (5,000 Service Population)	10 - 8	
10.2.8	Unit Cost of Level III (10,000 Service Population)	10 - 9	
10.2.9	Unit Cost of Level III (15,000 Service Population)	10 - 10	
10.2.10	Unit Cost of Flush Water Sealed with Septic Tank Toilet	10 - 11	
10.2.11	Unit Cost of Pour Flush with Double Pit Latrine	10 - 13	
10.2.12	Unit Cost of Ventilated Improved Pit Latrine (VIP)	10 - 14	

8

Table No.	Title	Page No.		
10.2.13	Unit Cost of School Toilet	10 - 15		
10.2.14	Unit Cost of Public Toilet	10 - 20		
10.3.1	Construction Cost of Water Supply Facilities Required			
	for Phase I (2000)	10 - 27		
10.3.2	Construction Cost of Water Supply Facilities Required			
	for Phase II (2010)	10 - 28		
10.3.3	Costs of Sanitation Facilities Required for Phase I (2000)	10 - 29		
10.3.4	Costs of Sanitation Facilities Required for Phase II (2010)	10 - 30		
10.4.1	Breakdown of Community Development and Training Cost	10,-31		
11.3.1	Percentages for Annual Investment	11 - 1		
11.4.1	Comprehensive Investment Need Ranking of the Municipalities	11 - 4		
12.4.1	Draft Formats for Annual Sector Performance Summary Report			
	(Provincial and Municipal Levels)	12 - 1		
DATA REPO	PRT	·		
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 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 -		
2.6.1	Guideline for Preparation of PW4SP	2 - 1		
	(Composition of Figures and Tables by Chapter/Section)			
2.6.2	Data File Linkages	2 - 12		
3.2.1	Flow Data of Major Rivers	3 - 1		
3.3.1	Number of Elementary School, High School and Other			
	Served Facilities	3 - 3		
3.5.1	Morbidity, Mortality and Infant Mortality by Municipality			
•	(Annual Incidence per 100,000 persons)	3 - 4		
3.5.2	Number of Health Facilities and Practitioners by Municipality	3 - 5		
3.6.1	Municipal Solid Waste Collection and Disposal by Municipality	3 - 6		
7.1.1	Water Source Information	7 - 1		
7.3.1	Major References	7 - 10		
f J , I	Major References	,		
7.3.2	Well Inventory by Municipality	7 - 11 7 - 16		

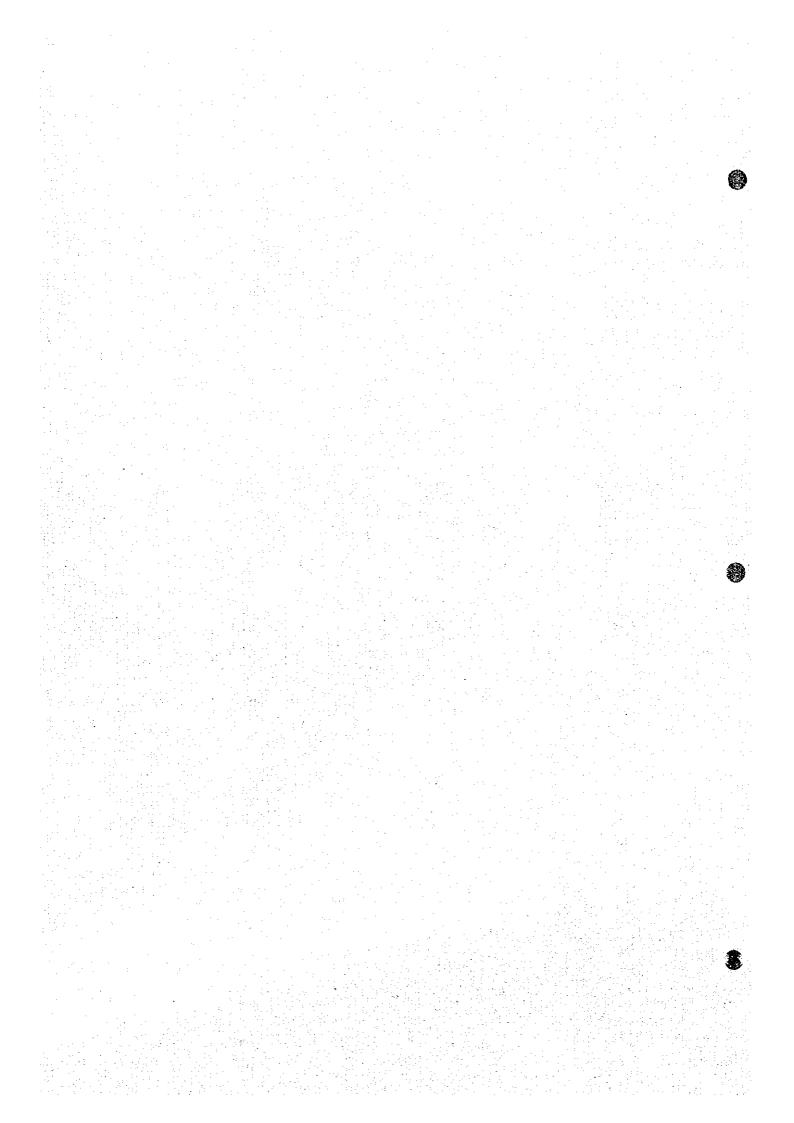
PROVINCIAL WATER SUPPLY, SEWERAGE AND SANITATION SECTOR PLAN

LIST OF FIGURES

Figure No.	Title	Page No.
SUPPORTING	G REPORT	
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 - 32
4.2.2	Standard Structure of School Toilet Facility	4 - 33
5.5.1	Organizational Chart (Provincial Planning and Development Office, Province of Nueva Vizcaya)	5 - 1
5.5.2	Organizational Chart (Provincial Engineer's Office, Province of Nueva Vizcaya)	5 - 2
5.5,3	Organizational Chart (Provincial Health Office, Province of Nueva Vizcaya)	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 - 15
8.4.2	Staged Improvement in Sewage Collection Method	8 - 16
DATA REPO	PRT'	
7.6.1	Individual Well Location and Specifications Map	7 - 18

SUPPORTING REPORT

A. BACKGROUND INFORMATION AND EXISTING CONDITIONS



- 1. INTRODUCTION
- 1.3 The Provincial Plan for the Province of Nueva Vizcaya
- 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	BATCH No. 2
(1) Zambales	(I) Abra
(2) Rizal	(2) Ilocos Norte
(3) Mindoro Oriental	(3) Ilocos Sur
(4) Mindoro Occidental	(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.

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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.



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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

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Coordinator 7. KENJI KASAMATU

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

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Assistant Secretary

Dept. of the Interior and Local Government

MRÍ 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 IICA 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

1

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.

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- 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.



8) SM

LIST OF ATTENDANTS

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Designation

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C. JICA

1. MR. EIJIE IWASAKI

Asst. Resident Representative, Philippine Office

D. JICA Study Team

- 1. MR. MASATOSHI MOMOSE
- 2. MR. MASUOMI HIROYAMA
- 3. MS. YOLANDA M, MINGOA
- 4. MR. WILFRIDO C. BARREIRO
- 5. MR. ALLEN LOWE

Team Leader

Water Supply Engineer

Sanitary Engineer

Institutional/CD/F Specialist

System Engineer



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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. YÓLANDA 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

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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.



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LIST OF ATTENDEES

Attendees

Designation

A. DILG

I. 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. OTHER AGENCIES

1. MR. VIRGILIO GACUSANA

Chief, Planning Division, PMO, DPWH

С. ЛСА

I. MR. EIJI IWASAKI

2. MR. NOBUAKI MIYATA

Asst. Resident Representative, Philippine Office Second Development Study Div., Social Development Study Dept.

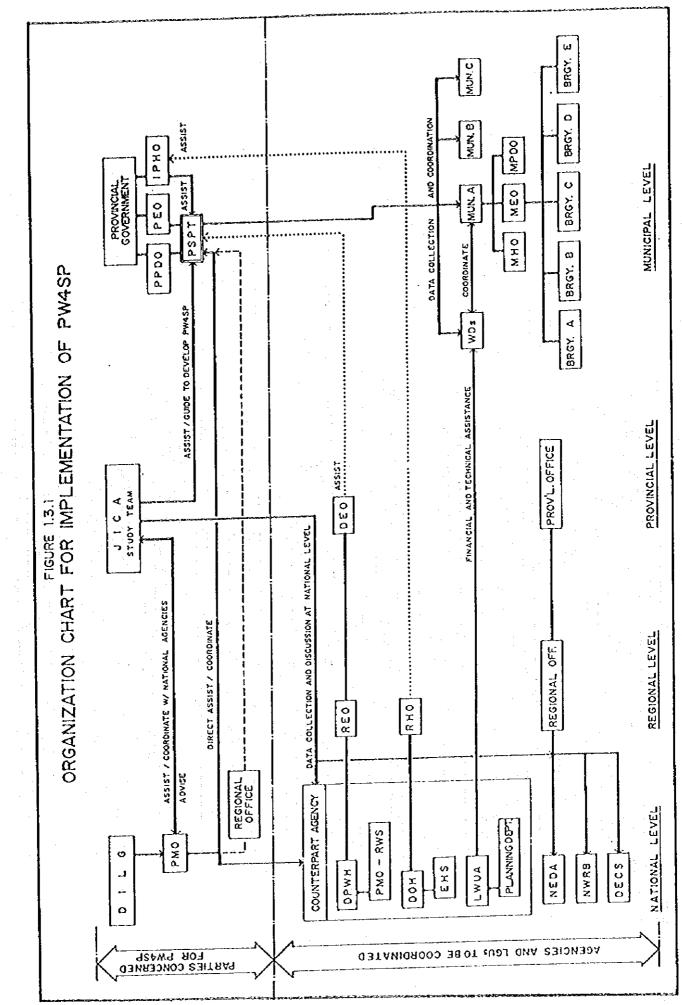
D. JICA Study Team

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









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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

IION. YÖLANDA 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.

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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 IICA 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.

- 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.

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LIST OF ATTENDEES

Attendees

Designation

A. DILG

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. Mindore
9. MS, MA. CONTESSA NAVARRO	DILG Coordinator, Nueva Vizcaya & Rizal
10. MS. VIVIAN BIALA	DILG Coordinator, Ilocos Sur & Zambales

B. OTHER AGENCIES

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

C. JICA

1. MR. SHIGEYUKI MATSUMOTO 2nd Development Study Div., Social Development Study Dept.

D. JICA Study Team

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.

Advantage

- 1. Minimum programming skills
- 2. Friendly environment to users
- Graphic presentation of data at user's option
- 4. Execution of data linkage at formula level entry
- 5. Guided formula creation using function wizard

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Disadvantage

- 1. Repeated entry of same formula
- 2. Sorting or indexing is done manually
- 3. All data are loaded in memory, which require huge amount of memory
- 4. Limited to static data linkages

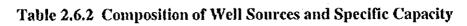
Data management task starts from the collection of data using the questionnaire forms. The existence and accuracy of data are major concern at this stage to prepare main information bases. Using the microcomputer provided with EXCEL spreadsheet, data in the questionnaire forms are transferred into the 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.	Level	Wate	r Supply Number of household to be served by Level I Facility Water Consumption Rate for Level III System	HH/Facility	
	Service Level	Sani	Std. number of student to be served by a unit of sanitary toilet Standard number of toilets for a public utility	Liter/capita/day Student/Toilet Toilet/Public Facility	
2.		1	Water Supply	Toncer done racing	. -
			UrbanWater Supply Rural Water Supply Sanitation	% of Population % of Population	
		Medium Term Plan	Sanitation Household Toilet Urban Household Toilet	% of Household	,
		Ē	Flush	% of Household	,
		Ę	Pour Flush	% of Household	·
		Ę	VIP Latrinc Rural Household Toilet	% of Household	
		Ê	Flush	% of Household	
	zet	Σ	Pour Flush	% of Household	
	7.	ļ	VIP Latrine	% of Household	
	F H	Į	School Toilet Public Toilet	% of Public Student	,
	용		Solid Waste	% of Public Utility % of Population	
	Provincial Sector Target	}	Water Supply	z or ropulation	·· · · · · · · · · · · · · · · · · · ·
	cial		UrbanWater Supply	% of Population	
	, ži		Rural Water Supply	% of Population	
i,	É		Sanitation		
	9	g	Household Toilet Urban Household Toilet	% of Household	
		ā.	Flush	% of Household	
		E	Pour Flush	% of Household	
:		Long Term Plan	VIP Latrine	% of Household	
		ů,	Rural Household Toiles Flush	~ -611	
		-	Pour Hush	% of Household % of Household	
			VIP Latrine	% of Household	
			School Toilet	% of Public Student	
			Public Toilet	% of Public Utility	
. 3.	Parcent	اعمة	Urban Sewerage f Level 3 Wells for Rehabilitation	% of Urban Population %	
4			F Sector Management Cost to Construction Cost	7/0	
			bility and Detail Design	% of Construction Cost	•
			truction Supervision	% of Construction Cost	
5	Contin		sical Contingency	#	-
			Contingency	% of Construction Cost Percent per annum	
6.	Comm		Development and Training Cost	receis yet amoni	
٠,		Leve	100	% of Construction Cost	
			Hand II	% of Construction Cost	<u>. </u>
7.	Recurrent Cost		l III System (Operating Cost) I III System (Spare Parts/Equipment)	Pesos/HH/year % of Construction Cost	•
	Ĕ		H System (Spare Parts/Equipment)	Pesos/HH/year	
1	Ĕ	Leve	11 System (Spare Parts/Equipment)	Pesos/HH/year	,
	[ဦ		ic School Toilet Maintenance Cost	Pesos/foilet/year	* .
8.			ic Utility Toilet Maintenance Cost	Pesos/Toilet/year	
17.	ranocat		ctors/rercentages of TRA	%	
	L		Municipality and Brgy.	% %	
9.	Fundin	g Lev	els/Percenatges for Different Financing Scenarios		
			cenario	% Funding Available	
	·		Scenario Scenario	% Funding Available	
			cenano cenario	% Funding Available % Funding Available	
	l		Cenario	% Funding Available	







				S	tandard Spa	cification
Municipality	Area	Source	Proportion	Depth	SWL	Specific Capacity
			(%)	(m)	(m)	(lit/sec/m)
	Roral	Shallow Well				
•	<u>l</u> [Deep Well				
	Urban	Shallow Well				
		Deep Well				
	Rural	Shallow Well				
	L	Deep Well				
	Urban	Shallow Well				
	L[Deep Well				
	Rural	Shallow Well				
		Dcep Well				<u></u>
	Urban	Shallow Well				
		Deep Well			· · · · · · · · · · · · · · · · · · ·	
	Rural	Shallow Well				
	<u></u> [Dcep Well				
	Urban	Shallow Well	<u> </u>			
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		Deep Well				
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	Rural	Shallow Well				
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	Rural	Shallow Well	ļ			
		Deep Well	1			
	Urban	Shallow Well				
	_ <u>.</u>	Deep Well				. .
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]	Deep Well				
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		Deep Well			 	
	Roral	Shallow Well				
* * * * * * * * * * * * * * * * * * * *		Deep Well		· · ·		
	Urban	Shallow Well				<u> </u>
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•	Rural	Shallow Well				<u> </u>
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	_	Deep Well	1			
	Rural	Shallow Well			ļ	
	[Deep Well	1			
	Urban	Shallow Well				
		Deep Well			L	<u></u>

Table 2.6.3 Annual Distribution of Investment Cost Required by Sub-sector for Medium-Term Development Plan

						Unit: Pea	cent
Sub-Sector	Component	1996	1997	1998	1999	2000	Total
	Level III System						
Urban Water Supply	Peasibility Study and Detail Design						
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Construction & Supervision		•	Ì	ļ	į	
2 7 07	Community Development & Training	L	<u> </u>		İ	<u> </u>	
	Level I Facility		Vite	建設的	44388	13.58.55	重额
. h	Detail Design	l			i	ŀ	<u> </u>
Rural Water Supply	Construction & Supervision						
ral Wa Supply	Community Development & Training						
le ju	Level II System		1216				
l ii	Detail Design			1			1
J _e die	Construction & Supervision		 _				
	Community Development & Training	<u> </u>					<u> </u>
	Urban Household Toilet						
_	Rural Household Toilet						l
ion	Public School Toilet						:
i i	Public Toilet		ĺ				
Sanitation	Disinfection of Level I Wells	ļ					
Sa	Detail Design	1					;
· .	Construction & Supervision						
<u> </u>	Community Development & Training	<u> </u>	L		Ĺ,	L	<u> </u>

Table 2.6.4 Level I Safe and Unsafe Percentage

Municipality	Safe Source (%)	Unsafe Source (%)
	1	
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	<u> </u>	
Provincial Average	l	<u> </u>

(2)

Table 2.6.5 Unit Construction Cost of Different Facilities

	Unit	Service (Service Coverage	Unit Cost	Cost
Description	Construction	Served	Served	Pesos/	Pesos/
	Cost (Pesos)	Population	Household	Person	Honsehold
Water Supply	March Street	THE SHAPE STORY		(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	Section Control
Level III - New System					
For 5000 Population				:	
For 10000 Population	•				
For 15000 Population			:		
Level III - Expansion					
For 5000 Population					
For 10000 Population					
For 15000 Population					
Level II					
Level					
Deep Well - 30 meter depth					•
Deep Well - 50 meter depth					
Deep Well - 70 meter depth					
Shallow Well					
Spring Development					
Rehabilitation Cost for Level I Deep Well					
Disinfection of Level I Wells					
Sanitation		2000			
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

	Underserved and	Underserved and	Population
Score	Population in Base	Population in Base Population in Phase III Systems in Base	III Systems in Base
	Year	Ī	Year
1.0	%>	%>	% >
0.8	>%>	>%>	>%>
9.0	>%>	>%>	>%>
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	Urban Sanitation	Rural Sanitation
1.0	N.A.	%>	%>	%>
0.8	N.A.	>%>	>%>	>%>
9.0	N.A.	>%>	>%>	>%>
4.0	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

		N	ueya Vizcaya		Reg	gion II	
Income Class	Total Fa		Annual	Income	Total Number	Annual Income	
	Number	Share	Total (P 1,000)	Average (Pesos)	of Families	Average (Pesos)	
Under 15,000	5,395	8.33	59,700	11,066	44,117	11,931	
15,000 - 19,999	3,042	4.70	49,405	16,240	39,031	17,561	
20,000 - 29,999	14,751	22.78	377,957	25,622	117,026	24,969	
30,000 - 39,999	12,823	19.80	435,470	33,960	88,207	35,044	
40,000 - 59,999	14,452	22.32	728,467	50,407	92,205	48,702	
60,000 - 99,999	7,358	11.36	583,461	79,294	57,838	75,35	
100,000 - 249,999	6,279	9.70	998,815	159,067	43,920	148,114	
250,000 and over	654	1.01	196,202	299,820	7,032	327,920	
Total/Average	64,754	100.00	3,429,477	30,576	489,370	50,856	
Median	-		:	36,123	3	35,48	

Source: 1991 Pamily Income and Expenditures Survey, NSO

Vota

(1) Based on NEDA and other agencies, poverty threshold in Region II in 1991 was estimated at P 42,400. Proportion of families below poverty level was 56 % 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

	Gainful		MAJOR	INDUSTRY	GROUP	
Major Occupation Group	Workers 15 Years Old and Over	Agriculture, Fishery and Forestry	Mining and Quarrying	Manu- facturing	Electricity, Gas and Water	Construction
Total	105,531	62,495	349	4,492	275	3,249
Official of Gov't. & Special Interest Org., Corp. Executives, Managers, Managing Prod. & Supervisors	4,813	9	-	150	10	116
Professional	4,988	10		21	30	111
Technicians and Associated Professional	1,262	42	-	41	-	
Clerks	2,363	-	-	102	51	12
Service & Shop Market Sales Workers	2,827	<u>.</u>	-	37	12	-
Farmers, Forestry Workers & Fishermen	40,119	39,914		70	_	
Craft and Related Workers	6,520	9	139	3,043	100	2,438
Plant & Machine Operators and Assemblers	3,491	341	30			
Elementary Occupations	33,773	22,068	180	+		
Other Occupations	4,091	102	-	39	22	21
Occupation Not Stated	1,284		<u> </u>	<u> </u>	L	<u> </u>

		MAJ	OR INDUST	RY GROUP		
Major Occupation 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	8,021	4,289	703	16,628	4,019	1,011
Official of Gov't. & Special Interest Org., Corp. Executives, Managers, Managing Prod. & Supervisors	3,443	32	40	981	32	-
Professional	32	. 21	102	4,565	96	
Technicians and Associated Professional	44	96	162	839	38	
Clerks	331	132	233	1,351	151	
Service & Shop Market Sales Workers	1,133	129	120	1,357	39	
Farmers, Forestry Workers & Fishermen	20	_		47		-
Craft and Related Workers	21	20	9	690	51	-
Plant & Machine Operators and Assemblers	109	1,913	-	199		-
Elementary Occupations	2,835	127	27	5,623		
Other Occupations	53	19	10		<u> </u>	
Occupation Not Stated				11	262	1,011

Source: NSO Census 1990

3.3.3 Education



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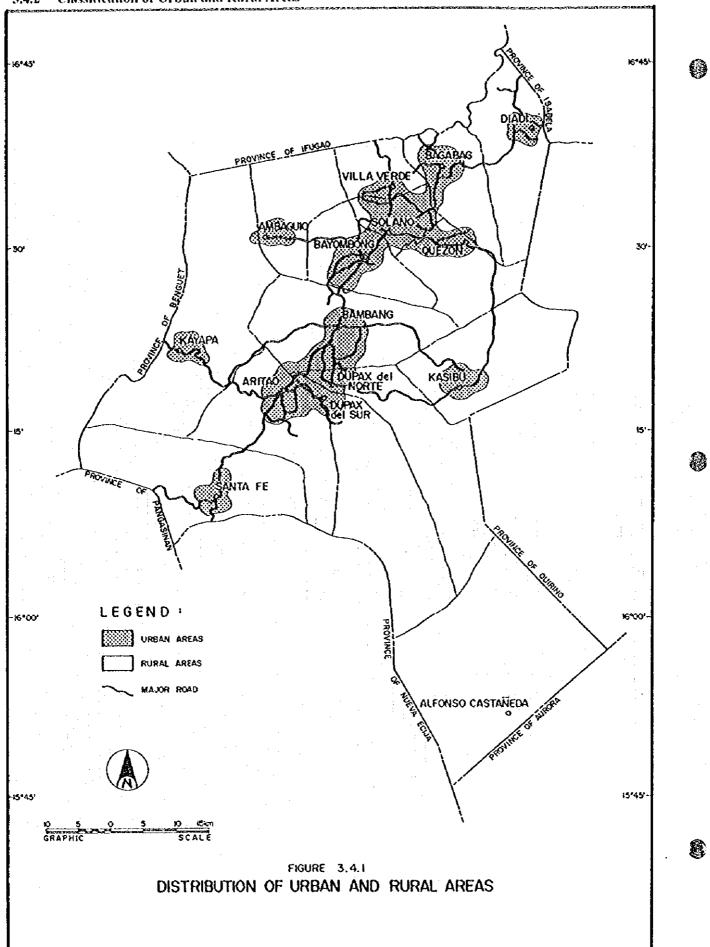
Table 3.3.3 Household Population by Highest Educational Attainment

Highest Educational	Household Population			P	Age Group			
Attainment	7 Years Old and Over	Below 20	20-24	25-29	30-34	35-39	40-44	45 & Over
Total	242,342	94,805	27,335	24,963	21,432	17,714	13,026	43,067
No Grade	19,093	6,675	667	898	919	880	880	8,17-
Pre-School	1,671	1,575	: 15	10	10	8	4	49
Elementary	121,629	58,280	8,212	9,064	9,177	8,020	6,133	22,74.
1st - 4th Grade	64,499	39,113	2,980	3,246	3,122	2,863	2,116	11,059
5th - 7th Grade	57,130	19,167	5,232	5,818	6,055	5,157	4,017	11,68-
High School	63,689	23,635	10,208	7,992	6.173	4,949	3,251	7,48
Undergraduate	36,941	17,865	4,778	3,547	2,820	2,400	1,649	3,88.
Graduate	26,748	5,770	5,430	4,445	3,353	2,549	1,602	3,599
Post Secondary	4,974	496	1,289	1,015	821	519	246	58
Undergraduate	1,361	219	321	: 236	177	155	87	160
Graduate	3,613	277	968	779	644	364	159	42.
College Undergraduate	16,615	3,891	4,363	2,655	1,904	1,440	892	1,470
Academic Degree Holder	14,130	47	2,514	3,278	2,384	1,867	1,596	2,44
Not Stated	541	206	67	51	44	31	24	113

Source: NSO Census 1990

3.4 Population

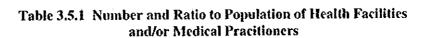
3.4.2 Classification of Urban and Rural Areas



3.5 Health Status

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3.5.3 Health Facilities and Practitioners



	Nueva	Vizcaya	Philip	pines
Health Facilities	Number	Ratio	Number	Ratio
Hospitals	5	1:60236	1,733	1:35017
RHUs	15	1:20079	2,295	1:26442
BHSs	96	1:3137	10,151	1:5978
Practitioners				
Doctors	67	1:4495	7,431	1:8166
Nurses	92	1:3274	10,270	1:5909
Midwives	96	1:3137	11,604	1:5230
Dentists	8	1:37647	1,550	1:39152

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 ^(D) (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 (B)	%satn	70	70	70	60	40
(Minimum)	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) Nitrate as Nitrogen	mg/L mg/L	nil 1	1 10	l NR	2 10	5
Phosphate as Phosporous	mg/L	តរាំ	0.1	0.2	0.4	
Phenotic Substances as	mg/L	nil	0.002	0.005	0.02	
Phenols Total Coliforms	MPN/100inL	50	1,000	1,000	5,000	
or Fecal Coliforms	MPN/100mL	20	100	200		
Chloride as CI	mg/l	250	250		350	<u>.</u> .
Copper	mg/L	l l	ı		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 contect 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 agnatic 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

NEDA	I				4		evel III	Service	5		
Geo- graphic	Municipality	Name of System (Operating Body)	l .	r of Bar Served	angays	1	ber of H Ids Serv		Numb	er of Popu Served	fation
Code			Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
0452002	Aritao	Arwasa, Inc.	1	2	3	271	118	389	. 1,626	708	2,334
0452003	Bagabag	Bagabag WS	4	0	4	343	0	343	1.818	0	1,818
0452005	Bayombong	Prov. WS	7		10	685	225	910	3,836	990	4,826
0452013	Solano	Prov. WS	6	0	6	546	0	546	2,730	. 0	2.730
	Provincial Total	al	18	5	23	1,845	343	2,188	10,010	1,698	11,708

NEDA			T			i	Level II	Services			
Geog- raphic	Municipality	Name of System (Operating Body)	1	ber of P Faucets		Numbe	r of Hou Served	useholds	Numl	er of Pop Served	ulation
Code	i.		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
0452002	Aritao	Arwasa, Inc.	. 0	0	0	0	<u> </u> 0	0	. 0	. 0	. 0
0452003	Bagabag	Bagabag WS	0	0	. 0	0	0	0	0	0	C
0452005	Bayombong	Prov. WS	3	- 1	- 11	4	15	. 5	84	22	100
0452013	Solano	Prov. WS	1	0	4	1	5	0	25	0	25
	Provincial Total	ıl	4	1	15	5	20	5	109	22	13)

NEDA		1		Water So	rces	Consumption					
Geo- graphic	Municipality	Name of System (Operating Body)	Type	Number	Production (cu.m/day)	Domestic	Institutional	Commercial	Industrial		
Code		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		l			(cv.	n√day)			
0452002	Aritao	Arwasa, Inc.		2	300	98	0	0	. (
0452003	Bagabag	Bagabag WS	DW	1	455	203	4	32			
0452005	Bayombong	Prov. WS	SP	1	6,500	1,297	17	41	(
0452013	Solano	Prov. WS				775	11	25	. (
	Provincial ?	lotal	55 TO A	4	11,051	2,373	32	98	(

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

2. Provincial total excludes Aritao and Bagabag.

										Consume	rs				<u>,</u>		
NEDA	. 1	Name of		mestic He connectio		Donies	6c Public	Faucets	ľ	nstitution	al .	•	Совынетс	ial	<u></u>	ladustri.	
Geo- graphic	Municipality	System (Operating	Consc		Con-		ection -	Con- sumption	Conne		Con- sumption	Conn		Con- sumption	Сови	ection	Con- sumptio
Code		Body)	Metered	Umme- tered	(cu.m/ day)	Meterro	Unme- tered	(cu.m/ day)	Metered	Unine- tered	(cu.m/ day)	Metered	L'anic- tered	(cu.m/ day)	Metered	('nrue- tere-d	(cu.m/
0453002	Aritas	Anvusa, Inc.	389	. 6	ys	ę,	0	0	e	. 6	. 0	0	0	0	0		
045203	Bagabag	Bagabag WS	343	0	203	0	0	O	1	0	4	21	0	32	0	15	
0452605	Businahirag	Prev. WS	823	RS	1,293	ı	,	3.5	11	,	13	24	2	41	4)	()	<u>'</u>
8452013	Solano	Prev. WS	. 493	52	775	0	1	6	7	3	L)	16	0	25	. "		<u> </u>
·	Fresincial To	اداداً	2,045	[41)	2,369	,	4		ŝė	,	.12	63	2	998			1

4.1.4 Level II Systems

Table 4.1.2 Existing Level II Systems

Sheet	1	
	<u> </u>	

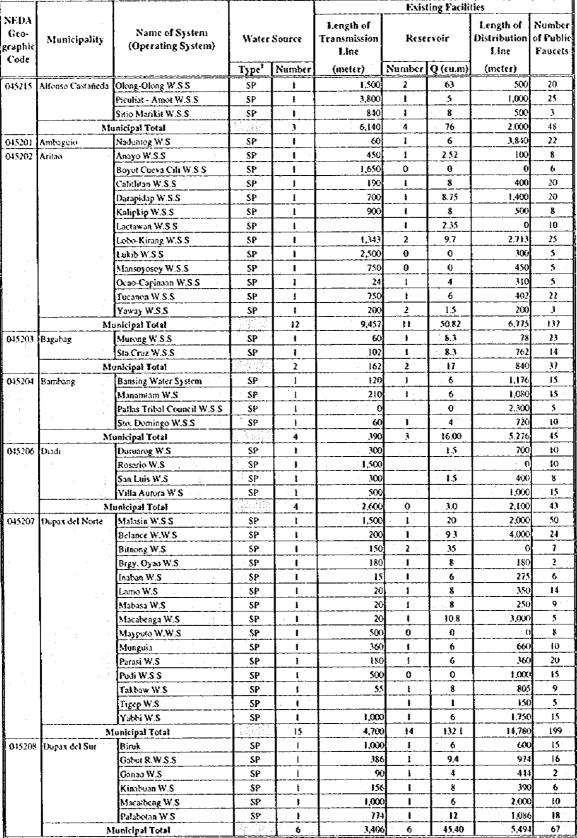




Table 4.1.2 Existing Level II Systems (Cont'd.)

	Shee

				<u>-</u> , <u></u>		Exis	ting Facili	ities	
NEDA Geo- graphic	Municipality	Name of System (Operating System)	Water	Source	Length of Transmission	Rese	rvoir	Length of Distribution	Number of Publi
Code				1	Line			Line	Faucets
	· 	<u> </u>	Type!	Number	(meter)		Q (cu.m)		<u> </u>
045209	Kasibu	Dine W.S	SP	1	500		6	1,500	
		Muta Tribal Council W.S	SP	1	100		ļ	1,310	- 5
		Publication Water System	SP	<u> </u>	900	1	6	408	17
		Siguem Tribal Council W.S	SP	<u> </u>	20	1		1,900	9
ļ		Watwat Tribal Council	SP		560	1 :	ļ	. 1,050	5
		unicipal Total		5	2,080	5	12	6,168	46
045210	Kayapa	Ambalata W.S.S	SP	<u> </u>		·		2,540	7
		Babadi W.S.S	SP	<u> </u>			ļ	1,930	6
į		Balwang Resettlement Area W	SP				<u> </u>	1,500	6
		Betilao W.S.S	SP	1				420	5
		Capulang W.S.S	SP	1				1,908	8
		Caritas Village W.S	SP	11	300	1		1,200	. 6
		Liten W.S.S	ŚP	<u> </u>			<u> </u>	2,120	7
-		Lower Tubong W.S	SP	i				762	12
. 1		Mapayao W.S.S	SP	ī			i	3,552	16
*		Nanciakan W.S.S	SP	ı			[996	10
. 1		Nayao W.S.S	SP	ı				6,950	12
		Oliweg W.S.S	SP	ı				1,750	3.
		Padang W.S.S	SP					3,450	6
		Pampang W.S	SP	1	200		6	1.380	18
		Patkiaw W.S.S	SP	i .			· · · · · ·	2.562	8
		Saliepan W.S.S	SP				<u> </u>	3,860	13
		San Fabian W.S.S	SP					5,440	19
	-1	Sayuding W.S.S	SP	i				1,182	1
	:	Tablite W.S.S	SP	 				546	5
		Talecabcab W.S.S	SP	 	90			1,650	6
		Tuppon W.S.S	SP	 	~~~~			2,048	9
		Tuyongan W.S.S	SP	<u> </u>	90			3,296	5
	M	unicipal Total	3,	22	680		6	51.012	191
015211		Totong W.S	SP		500		6	1,000	8
045212		· · · · · · · · · · · · · · · · · · ·	SP	 	300		<u>-</u>	402	34
194,5212	Sana re	Balifing W.S.S	SP	 	222		5.20	192	3
		Bantiban W.S	SP	;	222	.	3.20	1,836	1
		Bayabas W.S.S						2,800	25
		Belleng W.S.S	SP	 !			 	2,800	9
		Butao W.S.S	SP				 		
		Mag-asawang Kahoy W.S.S	SP	1			 -	1.351	6
		Mangcate Tribal Council	SP :	<u> </u>	66	!	ļ	1,200	
	1	Mangga W.S.S	SP	<u> </u>			_	1,180	
: 1		Melina W.S.S	SP				<u> </u>	3,552	- 11
		Pacalbo W.S.S	SP				- :	660	
		Perez Park W.S.S	SP	1.	300		ļ	1,300	 -
		Pulao W.S.S	SP				<u> </u>	600	
		Salacsac W.S.S	SP	l			ļ	1.341	4
,	•	Tactac W.S.S	SP	1	<u> </u>	_	ļ	860	4
		VillaFlores W.S	SP	1		2	6	2,610	
	M	unicipal Total	NOTE:	15	588	4	11	20,167	129
045213	Solano	Dadap W.S.S	SP	11	60	1	10.23	192	26
015214	Villaverde	Ocapon W.S.S	SP	1	1,000		6	1,500	. 7
		Brgy, Cabuluan W.S.S	SP	1	800	2	6.75	300	15
<u>. </u>	M	unicipal Total		2	1,800	3	13	1,800	22
	P.	rovincial Total		93	32,623	57	404.55	121,474	1,020

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

Table 4.1.2 Existing Level II Systems

Sheet 2

NEDA Geo-	Municipality	Name of System	Numb	Sheet 2 er of Bara Served	ingays	Numb	er of Hous Served	eholds	Numb	er of Popi Seried	ılation
graphic Code		(Operating Body)	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
045215	Alfonso Castañeda	Olong-Olong W.S.S	0	1	ı	0	100	100	0	600	600
]	Piculiat - Amot W.S.S	О	1	1	0	200	200	0	1,200	1,200
	<u> </u>	Sitio Marikit W.S.S	0	1	l I	. 0	15	15	. 0	90	90
	Ma	nicipal Total	0	3	3	0	315	315	0	1,890	1,890
045201	Ambaguio	Naduntog W.S	0	1	1	0	118	118	0	603	60
045202	Aritao	Anayo W.S.S	0	1		0	28	28	0	166	166
	1	Boyot Cueva Cili W.S.S	0	1		0	28	28	0	143	[4]
		Calithtan W.S.S	0	t	1	0	30	30	<u> </u>	360	.300
]	Darapidap W.S.S	0		1	0	60	60	o	.300	,3(X
		Kalipkip W.S.S	0		1	0	40	40	0	240	240
		Lactawan W.S.S				0	30	30	0	148	148
	İ	Lobo-Kirang W.S.S	0	1	1	0	50	50	0	300	300
		Lukib W.S.S	0		1	0	22	22	0	121	121
		Mansoyosoy W.S.S				0	22	22	0	126	120
		Ocao-Capinson W.S.S	- 0			0	26	26	0	1,38	138
	i	Tucanon W.S.S	0		!	0	98 22	98 22	0	519	519
٠.	Max	Yaway W.S.S		13	12	0		574	0	132	13.
045203	Bagahag	nicipal Total Murong W.S.S		12	1.6	0	574 79	79	0	3,236 474	3,236 474
04.200	Cognera	Sta.Cruz W.S.S	ŏ		-	0	88	88	0	480	480
	Me	nicipal Total	o	;	2	0	167	167	0	954	954
045204	Bambang	Bansing Water System	ŏ			0	81	81	o	476	470
		Manamtam W.S	0	i		0	69	69	0	318	341
		Pallas Tribal Council W.S.S	ŏ			. 0	27	27		115	115
		Sto. Domingo W.S.S	o	1	ı	0	57	57	0	319	319
	Mu	nicipal Total	0	4	4	o	234	234	0	1,258	1,258
045206	Diadi	Duruarog W.S	0	1		0	30	30	0	150	150
* .		Rosario W.S	0	· 1	I	0	0	0			(
	1	San Luis W.S	0	1		0	30	,30	0	150	- \$50
		Villa Aurora W.S	0	. 1		0	20	20	0	150	150
	Mu	nicipal Total	О	. 4	4	0	80	80	0	450	450
045207	Dupax del Norte	Malasin W.S.S	l	0		250	0	250	1,250	. 0	1,250
		Belance W.W.S	0	- 1	1	. 0	140	140	0	900	900
	:	Bitneng W.S	0	t	1	0	15	15	0	77	77
	:	Brgy, Oyao W.S	0		1	. 0	9	9	0	45	4.
		Inaban W.S	0	1	1	0	12	12	0	68	168
:		Lamo W.S	0	1	1	0	68	68	0	196	190
		Mabasa W.S	0	1	1	0	32	32	0	130	130
		Macabenga W.S	0	- 1	1	0	40	40	. 0	100	100
		Mayputo W.W.S	. 0		- 1	0	32	,12	0	125	12:
÷		Munguia	0	1		0		59	0	319	319
	1.1	Parasi W.S			- L	0	86	86		437	437
		Padi W.S.S	0		<u> </u>	0	30	30	0	120	120
		Takbaw W.S	0	· !	1	0	51	51	- 0	229	229
		Tigep W.S	0	<u>.</u>		0	27	27	0	50	50
	34	Yabbi W.S nicipal Total		1 1	15	250	50	50	1.350	200	200
045208	Dopax del Sur	Biruk	0	14	17	250 0	651 29	901 29	1,250	2,996	4.246
043200	Dopar oct sai	Gabut R.W.S.S	0			0	64		<u>c</u>]	56 381	50
		Ganao W.S	0			0	27	64 27	٠	384	38
		Kinabuan W.S	0		-	0	80	80	0	145 320	320
		Macatheng W.S	0		<u>'</u>	0	20	20	0	320 86	320
		Palabotan W.S	0		-	0		106	0	422	42.
					. 1	. 17			11		31







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

NEDA	1	Name of System		Sheet 2 er of Bara	ngays	Numbe	er of Hous Served	eholds	Numbe	r of Popo' Served	lation
Geo- graphic Code	Municipality	(Operating Body)	Urban	Served Rural	Total	Urban	Rural	Total	Urban	Rural	Total
045209	Kasibu	Dine W.S	0	1	1	0	30	30	0	120	120
04,5209	Kasied	Muta Tribal Council W.S	<u>`</u>		1	o	60	60	0	317	317
		Poblacion Water System	0		i	0	106	106	0	573	573
		Siguem Tribal Council W.S	0	i		0	49	. 49	G	247	247
		Watwat Tribal Council	0	<u> </u>	1	0	24	24	0	120	120
	Mi	inicipal Total	0	5	5	. 0	269	269	0	1,377	1,377
045210	Кауара	Ambalata W.S.S	0	1	1	0	39	39	. 0	215	215
1,7,1.210	11.4,5,0	Babadi W.S.S	0	l	i	D	30	30	0	162	162
		Balwang Reset, Area W.S.S	0	ı]	0	30	30	0	162	162
		Butilao W.S.S	ı	. 0	. 1	30	0	30	162	U	162
1		Capulang W.S.S	0	1	l	0	36	36	0	209	209
	1	Caritas Village W.S	0	I	. 1	0	32	32	0	156	156
l		Liten W.S.S	0	ı	,	0	35	.35	0	200	200
	1	Lower Tubong W.S	o	ı	1	0	60	60	0	342	342
		Mapayao W.S.S	0	1	ı	0	80	80	0	424	424
		Nanciakan W.S.S	0	1	i	0	47	47	0	250	250
		Nayao W.S.S	0	ı	ı	0	59	59	0	331	331
		Oliweg W.S.S	0			0	14	14	. 0	73	7.3
l		Padang W.S.S	0	1		0	28	28	0	157	157
À		Pampang W.S	j	0		95	0	95	505	0	505
1		Patkiaw W.S.S	0	1		0	40	40	0	232	232
1		Salicpan W.S.S	0	ŀ		0	62	62	0	360	360
<u>l</u>	1	San Fabian W.S.S	0		1	0	94	91	0	.561	564
A		Sayuding W.S.S	0	1	!	0	20			108	108
i		Tahlite W.S.S	U			ı c	10	10	0	53	5.3
1		Falecabcab W.S.S	0		!	0	30				177
1		Tuppan W.S.S	- 0		1.3.4	<u> </u>	45		·		266
1 .		Tuyongan W.S.S	. 0	1	1			7	i		14.5
<u> </u>	M	unicipal Total	2	20	2.		1	·			5,253
035211	Quezen	Totong W.S	0			<u> </u>		23			92
045212	Santa Fe	Balding W.S.S	C		i						1,120
Š	*	Bantinan W.S				1					90
		Bayabas W.S.S			ļ	i (+	
	1	Bollong W.S.S		 -	1	3					689
		Butao W.S.S		 		!	+				15
		Mag-asawang Kahoy W.S.S			<u> </u>	1 (10:
1		Mangeate Tribal Council					· 	i	 		10
i		Mangga W.S.S	(·	1				 -	
		Melina W.S.S				1 () 12				8
1	· '	Pacaibo W.S.S			<u> </u>		2	+			13
1		Perez Park W.S.S) . IC				
	1	Pulao W.S.S			1		20	+		+	
1		Salacsac W.S.S			; 		1			t	
1		Tactac W.\$.S VillaFlores W.\$	1	1	 		3				
	<u> </u>	lunicipal Total	 	+	6 1		67				
016315		Dadap W.S.S	 	4	; -		0 95				1
045213		Ocapon W.S.S	1	 	1	4	0 20				+
035214	Villaverde	Brgy, Cabuluan W.S.S	+				0 2:				
I	}	lunicipal Total	+		2		0 4:	+			
1	_ J <u>P</u>	AMINITAL BUTAN		9						23,265	25,18

Table 4.1.2 Existing Level II Systems

						ervice Con	Service Conditions During Dry Season	Dry Season			-
Sec-	Municipality	Name of System	Supply	Dirty	Taste/	Suppl	Supply Interruption (number/month)	(number/mor	nth)	Supply Wa	Supply Water Pressure (% of Total)
Code		(Operating body)	(Hrs/day)	Water¹	Smell ²	Power Failure	Pump Breakdown	Pipe Burst	Others	Adequate	Inadequate
045215	Altonso Castañeda	Olong-Olong W.S.S		0							
		Piculiat - Amot W.S.S		0							
		Sitio Marikit W.S.S		0	ც				}		-
	Ā	Municipal Total	0			0	٥	0	jo		
045201	Ambaguio	Naduntog W.S	24								
045202	Antao	Anayo W.S.S	8		-					100%	
		Boyot Cueva Cili W.S.S									
		Calitlitan W.S.S									
		Darapidap W.S.S	8								
		Kalipkip W.S.S	8								
oder webs		Lactawan W.S.S	8							100%	
		Lobo-Kirang W.S.S	24								
		Lukib W.S.S									
		Mansoyosoy W.S.S									
		Ocao-Capinaan W.S.S	24								
		Tucanon W.S.S	24								•
		Yaway W.S.S								100%	
	M	Municipal Total	151			0	0	0	į0		
045203	Bagabag	Murong W.S.S	8								-
		Sta.Cruz W.S.S	10								
	M	Municipal Total	6			0	0	0	0		
045204	Bambang	Bansing Water System	24								
		Manamtam W.S	24								
		Pallas Tribal Council W.S.S			C						
		Sto. Domingo W.S.S	24		. *						
	M	Municipal Total	24			0	0	0	0		
045206	Diadi	Duruarog W.S		-	C						
		Rosario W.S	•						-		

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

1

				Sheet 3	13						
						Service Con	Service Conditions During Dry Season	Dry Season			
NEDA See	Municipality	Name of System	vlaanS	Dirty	Taste/	Suppl	Supply Interruption (aumber/month)	(aumber/mon	(th)	Supply Wat	Supply Water Pressure (% of Total)
grapbic		(Operating Body)	(Hrs/day)	Water	Smell ²	Power Failure	Pump Breakdown	Pipe Burst	Others	Adequate	Inadequate
045206	Diadi	San Luis W.S			5						
		Villa Aurora W.S			Ð						
	2	Municipal Total	0			0 0	0	0	ं		
045207	Dupax del Norte	Belance W.W.S	9							%08	20%
	•	Bitnong W.S	24							70%	30%
		Brgy, Oyao W.S	24		C						
		Inaban W.S	4							306 306	10%
erene of office		Lamo W.S	4								
		Mabasa W.S	4								
		Macabenga W.S	C1							80%	20%
		Malasin W.S.S			O						
-		Mayputo W.W.S	24		S						
		Munguia	24	3	-						
		Parasi W.S	24								
		Pudi W.S.S	24		-						
		Takbaw W.S	24							80%	20%
		Tigep W.S	12		 			•		70%	30%
		Yabbi W.S	24		-1-					15%	
	•	Municipal Total	17			0	0	0	0		
045208	Dupax del Sur	Biruk	24								
		Gabut R.W.S.S	24								
		Ganao W.S	24								
		Kinabuan W.S	24								
		Macatheng W.S	24	-							
,		Palabotan W.S	24								
		Municipal Total	24			0	0	0	0		
045209	Kasibu	Dine W.S	24		34						
		Muta Tribal Council W.S									

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

	Supply Water Pressure (% of Total)	Adequate Inadequate						-																				
		Others				0											_											
ry Season	umber/mor	Pipe Burst				0																						
Service Conditions During Dry Season	Supply Interruption (number/month)	Pump Breakdown				0							-															
ervice Cond	Suppl	Power Failure				0																						
S	Taste/	Smell ²				64 5 Sept. 188																		2			1	
	Dirty	Water													,					-								
	Supply	(Hrs/day)	24			77 77														24								
1	Name of System	(Operating poor)	Poblacion Water System	Signem Tribal Council W.S	Watwat Tribal Council	Municipal Total	Ambalata W.S.S	Babadi W.S.S	Balwang Reset. Area W.S.S	Butilao W.S.S	Capulang W.S.S	Cantas Village W.S	Liten W.S.S	Lower Tubong W.S	Mapayao W.S.S	Nanciakan W.S.S	Nayao W.S.S	Oliweg W.S.S	Padang W.S.S	Pampang W.S	Patkiaw W.S.S	Salicpan W.S.S	San Fabian W.S.S	Sayuding W.S.S	Tablite W.S.S	Talecabeab W.S.S	Tuppan W.S.S	
	Municipality	:	Kasibu		-	W	Kayapa															٠					-	
N.T.N.A	Geo-	Code	045209			A	045210																					-

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

"	3
400	,
7	5
	•

Geo- graphic Code O45211 Ouezon O45212 Santa Fe Battinan W.S. Battinan W.S. Battinan W.S. Battinan W.S. Battinan W.S. Battinan W.S. Battinan W.S. Battinan W.S. Battinan W.S. Battinan W.S. Battinan W.S. Battinan W.S. Battinan W.S. Battinan W.S. Battinan W.S. Battinan W.S. Mangeawang Kahoy W.S. Mangeawang Kahoy W.S. Mangeawang Kahoy W.S. Mangeawang Kahoy W.S. Mangeawang Kahoy W.S. Mangeawang Kahoy W.S. Pacalbo W.S.S Pattina W.S.S Pattina W.S.S Pattina W.S.S Salacsac W.S.S VillaFlores W.S. Municipal Total O45213 Solano Dadap W.S.S O45214 Villaverde Bryy. Cabuluan W.S.S				Service Conc	Service Conditions During Dry Season	Dry Season			
Operating Body Ouczon Totong W.S. Santa Fe Balling W.S.S Bayabas W.S.S Bollong W.S.S Bollong W.S.S Bollong W.S.S Mage-asawang Kahoy W. Manggaare Tribal Counci Manggaa W.S.S Melina W.S.S Pacalbo W.S.S Pacalbo W.S.S Pacatac W.S.S Pacatac W.S.S Pacatac W.S.S Pacatac W.S.S Tactac W.S.S VillaFlores W.S. Municipal Total Solano Dadap W.S.S Villaverde Brgy, Cabuluan W.S.S		Dirty	Taste/	Suppl	Supply laterruption (number/month)	(number/mon	(th)	Supply Wa	Supply Water Pressure (% of Total)
Couezon Totong W.S. Santa Fe Baliling W.S.S. Bayabas W.S.S. Bayabas W.S.S. Bollong W.S.S. Bollong W.S.S. Mag-asawang Kahoy W. Mangcate Tribal Counci Mangcate Tribal Counci Mangcate W.S.S. Pacalbo W.S.S. Perez Park W.S.S. Perez Park W.S.S. Palacsac W.S.S. Tactac W.S.S. VillaFlores W.S. Municipal Total Municipal Total Dadap W.S.S. Municipal Total	(Hrwday)	Water 1	Smell ²	Power Failure	Pump Breakdown	Pipe Burst	Others	Adequate	Inadequate
Balting W.S.S Bantinan W.S. Bayabas W.S.S Bellong W.S.S Bellong W.S.S Bellong W.S.S Bellong W.S.S Mag-asawang Kahoy W. Mangcate Tribal Counci Mangga W.S.S Melina W.S.S Perez Park W.S.S Perez Park W.S.S Perez Park W.S.S Tactac W.S.S VillaFlores W.S. Municipal Total Solano Dadap W.S.S Aunicipal Total	24							100%	
Bantinan W.S. Bayabas W.S.S Bollong W.S.S Butao W.S.S Butao W.S.S Mage-asawang Kahoy W. Manggae Tribal Counci Mangga W.S.S Melina W.S.S Pacalbo W.S.S Prez Park W.S.S Prez Park W.S.S Prez Park W.S.S Prez Park W.S.S Prez Park W.S.S Prez Park W.S.S NillaFlores W.S. VillaFlores W.S. Municipal Total Solano Dadap W.S.S Villaverde Brsy. Cabuluan W.S.S									
Bayabas W.S.S Bollong W.S.S Butao W.S.S Butao W.S.S Mag-asawang Kahoy W. Mangcate Tribal Counci Mangga W.S.S Melina W.S.S Pacalbo W.S.S Perez Park W.S.S Perez Park W.S.S Pulao W.S.S Tactac W.S.S Tactac W.S.S VillaFlores W.S. Municipal Total Solano Dadap W.S.S VillaFlores W.S. Willary, Cabuluan W.S.S	24								
Bollong W.S.S Butao W.S.S Mag-asawang Kahoy W. Manggawang Kahoy W. Manggawang Kahoy W. Manggawang Kahoy W. Magrate Tribal Counci Manggaw.S.S Pacalbo W.S.S Perez Park W.S.S Pulao W.S.S Tactac W.S.S Tactac W.S.S VillaFlores W.S. Municipal Total Solano Dadap W.S.S Villarverde Brxy, Cabuluan W.S.S									
Butao W.S.S Mag-asawang Kahoy W. Manggate Tribal Counci Manggate W.S.S Melina W.S.S Pacalbo W.S.S Pacalbo W.S.S Pulao W.S.S Salacsac W.S.S Tactac W.S.S VillaFlores W.S. Municipal Total Solano Dadap W.S.S Willary. Cabuluan W.S.S									
Mangcate Tribal Counci Mangga W.S.S Mangga W.S.S Melina W.S.S Pacalbo W.S.S Perez Park W.S.S Pulso W.S.S Pulso W.S.S Tactac W.S.S Tactac W.S.S Tactac W.S.S Municipal Total Solano Dadap W.S.S Villarorde Bryy, Cabuluan W.S.S									
Solano Villavorde	S.S.		-						
Mu Solano Villavorde									
Mu Solano Villavorde									
Ma Solano Villaverde									
Ma Solano Villaverde									
Mu Solano Villaverde									
Mu Solano Villaverde									
Mu Solano Villaverde		1							
Mu Solano Villavorde									
Solano Villavorde	24								
Solano Villaverde	24			0	0	0	0		
	10		S					3	
3 3 /N 1000C		0						46%	34%
Ocapon W.S.S	24								
Municipal Total	17			0	0	0	O		

Note: 1. Dirty Water: E - Everyday. OW - Once a week, OM - Once a month, O - Occassional. 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		-			4	Number of Staff	ıtı		
ફું	Municipality	Name of System	Technical	Administrative		Total	Ä	Repair Work	
graphic Code		(Operating Body)	Professional	Staff	Collector	Number of Staff	Local Trademan	MEO/CEO	DEO
045215	Alfonso Castañeda	Olong-Olong W.S.S			·				
		Piculiat - Amot W.S.S	2			2			
		Sitio Marikit W.S.S	2			2			
		Municipal Total	\$	0	0	4	0	0	O
045201	Ambaguio	Naduntog W.S							
045202	Aritao	Anayo W.S.S							
· 		Boyot Cueva Cili W.S.S					٠		
		Caliditan W.S.S							
		Darapidap W.S.S							
		Kalipkip W.S.S							
		Lactawan W.S.S							
		Lobo-Kirang W.S.S							
		Lukib W.S.S							
		Mansoyosoy W.S.S							
		Ocao-Capinaan W.S.S							
		Tucanon W.S.S							
		Yaway W.S.S							
		Municipal Total	0	0	0	0	0	0	ò
045203	Bagabag	Murong W.S.S							
.		Sta. Cruz W.S.S							
		Municipal Total	0	0	0	0	0	0	0
045204	Bambang	Bansing Water System							
<u></u>		Manamtam W.S							
		Pallas Tribal Council W.S.S							
-		Sto. Domingo W.S.S							
		Municipal Total	0	0	0	0	0	0	٥

0

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

T

			Sh	Sheet 4					
YOU'S					N.	Number of Staff	uff.		
S S	N. Commission of Street	Name of System	Tochmion	Administrative		Total		Repair Work	
graphic	âlirdixunya:	(Operating Body)	Professional	Staff	Collector	Number of Staff	Local Trademan	MEO/CEO	DEO
045206	Diadi	Duruarog W.S							
<u> </u>		Rosario W.S							
		San Luis W.S							
		Villa Aurora W.S							
		Municipal Total	0	0	0	0	0	0	0
045207	Бирах dei None	Belance W.W.S							
		Bitnong W.S							
 -		Brgy, Oyao W.S							
		Inaban W.S							
		Lamo W.S							
		Mabasa W.S							
		Macabenga W.S							
		Malasin W.S.S							
	-	Mayouto W.W.S							
		Munguia	:						
		Parasi W.S							
-		Pudi W.S.S							
		Takbaw W.S							
		Tigep W.S							
		Yabbi W.S							
		Municipal Total	0		0		0	0	0
045208	Dupax del Sur	Biruk							
		Gabut R.W.S.S							
		Ganao W.S							
		Kinabuan W.S							
Z,= 13		Macatheng W.S							
		Palabotan W.S							
		Municipal Total	0		0 0		0 0	0	<u>ح</u>

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

			Sho	Sheet 4					
NEDA						Number of Staff	E E		
ફું	Municipality	Name of System	Technical	Administrative		Total	Re	Repair Work	
graphic Code		(Operating Body)	Professional	Staff	Collector	Number of Staff	Local Trademan	MEO/CEO	оза
045209	Kasibu	Dinc W.S							
	*	Muta Tribal Council W.S							
·		Poblacion Water System				-			
		Siguem Tribal Council W.S							
		Watwat Tribal Council							ì
		Municipal Total	0	0	0	0	0	0	O
045210	Хауара	Ambalata W.S.S							
		Babadi W.S.S							
		Balwang Reset, Area W.S.S							
		Butilao W.S.S							
		Capulang W.S.S		* * *					
····		Caritas Village W.S							
		Liten W.S.S							
		Lower Tubong W.S							
 :		Mapayao W.S.S							
		Nanciakan W.S.S							
		Nayao W.S.S							
·		Oliweg W.S.S							
		Padang W.S.S							
		Pampang W.S							
		Patkiaw W.S.S							
-,		Salicpan W.S.S				-			
		San Fabian W.S.S							
- 1 .		Sayuding W.S.S							
		Tahlite W.S.S		,					
	-	Talecabcab W.S.S							
		Tuppan W.S.S							
	-	Tuyongan W.S.S							
		Municipal Total	0	0	0	Ó	0	0	Ö





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

					Z	Number of Staff	ſſ		
, &	, and a second s	Name of System	Toolanian.	Administrative		Total		Repair Work	
graphic	interpretation ((Operating Body)	Professional	Staff	Collector	Number of Staff	Local Trademan	MEO/CEO	рεо
045211	Quezon	Totong W.S							
	Santa Fe	Baliling W.S.S							
		Bantinan W.S							
		Rayabas W.S.S							
		Bollong W.S.S							
		Butao W.S.S							
		Mag-asawang Kahoy W.S.S							
		Mangcate Tribal Council							
		Mangga W.S.S							
		Melina W.S.S							
		Pacalbo W.S.S							
		Perez Park W.S.S							
		Pulao W.S.S							
		Salacsac W.S.S							
		Tactac W.S.S							
		VillaFlores W.S							
== =		Municipal Total		0	٥		0	0	
045213	Solano	Dadap W.S.S							
045214	Villaverde	Brgy. Cabuluan W.S.S							
		Ocapon W.S.S							
z- 		Municipal Total	0	0	0	0		0	

Table 4.1.2 Existing Level II Systems

						Expenditures	ıres				,	Tariff	بازز		
NEDA Geo- graphic	Municipality	Name of System (Operating Body)	Annual	Wages	Fuel, Chem, Mat'l.		Repairs	Loan Repayment	Other	Consumer Payment	Cost per Pail	Cost per Cubic Meter	Cost Per Household	Other	Average Collection Efficiency
Š					(The	(Thousand of Pesos/year)	sos/vear)		1	(Year)		(Pesos)	(so.		(%)
045215	Alfonso Castaneda	Olong-Olong W.S.S													
		Piculiat - Amot W.S.S							-						
	:														
	Mo	Municipal Total	0	0	0	0	0	0	٥	٥	0	0	0	٥	\$
045201	Ambaguio	Naduntog W.S													
045202	Antao	Anayo W.S.S											2.00		
		Boyot Cueva Cili W.S.S													
		Calithtan W.S.S													
·		Darapidap W.S.S				,									
<u> </u>		Kalipkip W.S.S						-							
·		Lactawan W.S.S											5.00		
		Lobo-Kirang W.S.S								1					
====		Lukib W.S.S			-										
		Mansoyosoy W.S.S													
		Ocao-Capinaan W.S.S													
		Tucanon W.S.S													
· ·		Yaway W.S.S											\$.00		
	W	Municipal Total	0	0	0	0	٥	0	0	0	0	0	12.00	٥	٥
045203	Bagabag	Murong W.S.S													
		Sta.Cruz W.S.S		·											
	W	Municipal Total	0	0	0	0	0	0	0	0	0	0	0	0	δ
045204	Bambang	Bansing Water System													
		Manamtam W.S													
=:=:=		Pailas Tribal Council W.S.S													
		Sto. Domingo W.S.S			:										
	Mi	Municipal Total	0	0	0 0	0	0	0	0	0	0 (0	0 6	0	Ò

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

						rs.	Sheet 5								
						Expenditures	res	:				Tariff	it.		
NEDA Geo- graphic	Municipality	Name of System (Operating Body)	Annual	Wages	Fuel, Chem, Mat'l.	Transport	Repairs	Loan Repayment	Other	Consumer Payment	Cost per Pail	Cost per Cubic Meter	Cost Per Bousehold	Other	Average Collection Efficiency
<u>ខ</u> ្ពី					(Tbo	(Thousand of Pesovyear)	sov/vear)			(Year)		(Pesos)	os)		(%)
045206	Diadi	Dumarog W.S													
		Rosano W.S													
		San Luis W.S													
		Villa Aurora W.S.													
	Mu	Municipal Total	0	0	0	0	0	0	0	0	ō	0	0	0	٥
0.5207	Dupax del Norte	Belance W.W.S													
		Bitnong W.S				;									
		Brgy, Oyao W.S													
		Inaban W.S				1									
	-1	Lamo W.S													
<u></u> .		Mabasa W.S													
		Macabenga W.S													
		Malasin W.S.S													
		Mayputo W.W.S													
		Munguia													
		Parasi W.S													
		Pudi W.S.S													
		Takbaw W.S													
		Tigep W.S													
· · · · · ·		Yabbi W.S							,						
	M	Municipal Total	0	0	0	0) 0) 0	0		0	0	0	٥	ै
045208	Dupax del Sur	Biruk	_										10.95		
		Gabut R.W.S.S		,		11 1									
		Ganao W.S	-												
<u></u>		Kinabuan W.S			!								6.95		
		Macatheng W.S											6.45		
		Palabotan W.S													
	M	Municipal Total)	0 (0	0		0 0	0		0	0	24.35	0	

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

		Average Collection Efficiency	(%)						Ö																							0
		Other							0																							°
	iff	Cost Per Household	(30)						0															-								°
	Tariff	Cost per Cubic Meter	(Pesox)						0			7.0																				0
		Cost per Pail							0																							0
		Consumer Payment	(Year)						0																							0
		Other							0		İ									-			-									0
		Loan Repayment							0				}																			0
Sheet 5	ıres		sos/vear)						0					-																		0
2	Expenditures	Transport Repairs	(Thousand of Pesos/year)						0																							0
		Fuel, Chem, Mat'l.	(Tho	Ì					0															-				-				0
		Wages							Φ		-	-				-	-															0
		Annual	· .						0					-																		0
		Name of System (Operating Body)		Dine W.S	Muta Tribal Council W.S	Poblacion Water System	Siguem Tribal Council W.S	Watwat Tribal Council	Municipal Total	Ambalata W.S.S.	Babadi W.S.S	Balwang Reser. Area W.S.S	Butilao W.S.S	Capulang W.S.S	Carrias Village W.S	Liten W.S.S	Lower Tubong W.S	Mapayao W.S.S	Nanciakan W.S.S	Nayao W.S.S.	Oliweg W.S.S	Padang W.S.S	Pampang W.S	Patkiaw W.S.S	Salicpan W.S.S	San Fabian W.S.S	S.S.W. gnibuyes.	Tablite W.S.S	Talecabcab W.S.S	Tuppan W.S.S	Tuyongan W.S.S	Municipal Total
		Municipality		Kasıbu					Mw	Kayapa						-		-				-							-			Mu
	, La.	See Zraphic	3	045209						045210																						

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

						Š	Sheet 5								
				-		Expenditures	ıres		7			Tariff			
NEDA Ge- graphic	Municipality	Name of System (Operating Body)	Annual	Wages	Fuel. Chem.	Fuel, Chem. Transport Repairs		Loan Repayment	Other	Consumer Payment	Cost per Pail	Cost per Cubic Meter	Cost Per Household	Other	Average Other Collection Efficiency
ğ					(T)	(Thousand of Pesos/year)	sos/vear)			(Year)		(Pesos)	(50		(%)
045211	Ouezon	Totong W.S													
045212	Santa Fe	Baliling W.S.S													
<u></u>		Bandnan W.S												†	
		Bayabas W.S.S													
=	. <u>.</u> 1	Bollong W.S.S				:								1	
		Butao W.S.S							1						
<u> </u>		Mag-asawang Kahoy W.S.S													
		Mangcate Tribal Council													
		Manega W.S.S			·										
		Melina W.S.S													
		Pacaibo W.S.S													
		Perez Park W.S.S.													
		Pulao W.S.S													
·		Salaesae W.S.S													
		Tactac W.S.S													
		VillaFlores W.S											ļ		
==	X	Municipal Total	0	0	0 0		0	0	٥	0	0	0	Ö	°	
045213	Solano	Dadap W.S.S													
045214	Villaverde	Brgy, Cabuluan W.S.S	-												
		Ocapon W.S.S													·
	×	Municipal Total	0	0 (0		0	0	0	0	Ö	٥	0	٥	5
				İ											

Table 4.1.2 Existing Level II Systems

Signature Public House Public House Public Consumers Citi W.S.S Ci					,	Sheet 6							
Manicipality Name of System Annoal Public House Expected Connecting Body Connecting Bo						Billings					Revenues		
Sambang Sambang Chamber Chamber Chambang Ch	NEDA Ge- graphic	Municipality	Name of System (Operating Body)	Annual	Public Faucet Consumers	House Connection Consumers	Expected Subsidies		Annual	Payment by Public Faucet Consumers	Payment by House Connection Consumer	Subsidies	Others
15 Alfonso Castaneda	ğ Ö			(Number)				C	housand	of Pesos/vear)			
Piculiar - Amot W.S.S Sito Marikit W.S.S Ambaguio Naduntog W.S Antao Anayo W.S.S Evoyet Cueva Cili W.S.S Calithian W.S.S Calithian W.S.S Lactawan W.S.S Lobe-Kirang W.S.S Lobe-Kirang W.S.S Lobe-Kirang W.S.S Lobe-Kirang W.S.S Lotto W.S.S Manocossoy W.S.S Tucanon W.S.S Municipal Total Municipal Total Municipal Total Municipal Total Manamam W.S.S Sa.Cruz W.S.S Manamam W.S.S Sale Chara W.S.S Manamam W.S.S Sale Chara W.S.S Manamam W.S.S Sale Chara	045215	Alfonso Castaneda	Olong-Olong W.S.S										
Sitto Mankit W.S.S Ambaguio Naduntog W.S Antiao Anayo W.S.S Boyot Cueva Cili W.S.S Calititan W.S.S Calititan W.S.S Lactawan W.S.S Lactawan W.S.S Luckb W.S.S Luckb W.S.S Luckb W.S.S Amswowsoy W.S.S Tucanon W.S.S Tucanon W.S.S Tucanon W.S.S Tucanon W.S.S Tucanon W.S.S Tucanon W.S.S Tucanon W.S.S Tucanon W.S.S Tucanon W.S.S Tucanon W.S.S Tucanon W.S.S Municipal Total Municipal Total Banxing Water System Banxing Water System Municipal Total Municipal Total Ranxing W.S.S Palla Tribal Council W.			Piculiat - Amot W.S.S										
Ambaguio Naduntog W.S. Antao Anayo W.S.S. Boyor Cueva Cili W.S.S. Calititan W.S.S. Darapidap W.S.S. Kalipkip W.S.S. Locko-Kirang W.S.S. Locko-Kirang W.S.S. Locko W.S.S. Mansoyosoy W.S.S. Municipal Total Municipal Total Mannicipal Total Mannicipal Total Municipal Total Mannicipal Total Municipal Total Mannicipal Total Municipal Total Mannicipal Total Municipal Total Mannicipal Total			Siuo Marikit W.S.S										
Antoguio		Mu	micipal Total										
Antiao	045201		Naduntog W.S										
Boyot Cueva Cili W.S.S Calititian W.S.S Darapidap W.S.S Kalipkip W.S.S Lacawan W.S.S Lobo-Kirang W.S.S Mansoyosoy W.S.S Mansoyosoy W.S.S Tueanon W.S.S Tueanon W.S.S Tueanon W.S.S Municipal Total Bansing Waker System Manamam W.S. Sto. Domingo W.S.S Sto. Domingo W.S.S Sto. Domingo W.S.S Sto. Domingo W.S.S Sto. Domingo W.S.S Sto. Domingo W.S.S Sto. Domingo W.S.S	045202	Antao	Anavo W.S.S										
Calititan W.S.S Darapidap W.S.S Kalipkip W.S.S Lactawan W.S.S Luckb W.S.S Luckb W.S.S Mansoyosoy W.S.S Tocanon W.S.S Tocanon W.S.S Tocanon W.S.S Tocanon W.S.S Away W.S.S Sta.Cruz W.S.S Muncipal Total Bambang Bansing Water System Manamtam W.S Pallas Tribal Council W.S.S Sto. Domingo W.S.S			Boyot Cueva Cili W.S.S										
Darapidap W.S.S			Calithian W.S.S										
Kalipkip W.S.S Lactawan W.S.S Lobo-Kirang W.S.S Lukib W.S.S Lukib W.S.S Mansoyosoy W.S.S Tucanon W.S.S Yaway W.S.S Aurong W.S.S Municipal Total Bambang Banking Water System Manamtam W.S Sto. Cruz W.S.S Manamtam W.S Sto. Domingo W.S.S Municipal Total Municipal Total Sto. Domingo W.S.S Sto. Domingo W.S.S Sto. Domingo W.S.S Municipal Total Sto. Domingo W.S.S Sto. Domingo W.S.S Municipal Total Sto. Domingo W.S.S			Darapidap W.S.S										
Lactawan W.S.S Lobo-Kirang W.S.S Louidb W.S.S Mansoyosoy W.S.S Tucanon W.S.S Yaway W.S.S Yaway W.S.S Municipal Total Bambang Banning Water System Manamitam W.S Sio, Domingo W.S.S Municipal Total Manamitam W.S Sio, Domingo W.S.S Municipal Total Municipal Total Manamitam W.S Sio, Domingo W.S.S Sio, Domingo W.S.S Municipal Total			Kalipkip W.S.S										
Lobo-Kirang W.S.S	4		Lactawan W.S.S					Ì					
Luido W.S.S Mansoyosoy W.S.S Ocao-Capinan W.S.S Tucanon W.S.S Tucanon W.S.S Tucanon W.S.S Amnicipal Total Murong W.S.S Murong W.S.S Muricipal Total Bambang Bansing Water System Manamtam W.S Pallas Tribal Council W.S.S Sto. Domingo W.S.S Sto. Domingo W.S.S Municipal Total Municipal Tota			Lobo-Kirang W.S.S										
Mansoyosoy W.S.S Deao-Capinaan W.S.S Tucanon W.S.S Tucanon W.S.S Yaway W.S.S Municipal Total Municipal Total Bambang Bansing Water System Manamtam W.S Pallas Tribal Council W.S.S Sto. Domingo W.S.S Sto. Domingo W.S.S Municipal Total		Lukib W.S.S											
Ocao-Capinaan W.S.S Tucanon W.S.S Yaway W.S.S Yaway W.S.S Municipal Total Murong W.S.S San Cruz W.S.S Bambang Bansing Water System Manamtam W.S Sto. Domingo W.S.S Sto. Domingo W.S.S Municipal Total			Mansovosoy W.S.S										
Tucanon W.S.S			Ocao-Capinaan W.S.S										
Yaway W.S.S			Tucanon W.S.S										
Bagabag Murong W.S.S Sta. Cruz W.S.S Sta. Cruz W.S.S Municipal Total Banking Water System Manamtam W.S Pallas Tribal Council W.S.S Sto. Domingo W.S.S Sto. Domingo W.S.S Municipal Total			Yaway W.S.S										
Bagabag Murong W.S.S Sta.Cruz W.S.S Aunicipal Total Bansing Water System Manamtam W.S Pallas Tribal Council W.S.S Sto. Domingo W.S.S Municipal Total Municipal Total		Mu	unicipal Total				:						
San.Cruz.W.S.S	045203		Murong W.S.S										
Mur Bambang			Sta. Cruz W.S.S										
Bambang	·	Wu	micipal Total										
Wm	045204		Bansing Water System				:						
Paltas Tribal Council W.S.S Sto. Domingo W.S.S Municipal Total		,	Manamtam W.S										
Sto, Domingo W.S.S Municipal Total			Pallas Tribal Council W.S.S										
Municipal Total			Sto, Domingo W.S.S										
		Mc	Municipal Total					***************************************					

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

1

T

of System tring Body) (Number)						Sheet 6							
Municipality (Operating Body) (Number) Diadi (Numarog W.S. (Number) Diadi (Norto (Number) (Number) Municipal Total (Norto (Number) (Number) (Number) Municipal Total (Number) Mabasa W.S. (Namber) (Number) Mabasa W.S. (Namber) (Number) Mabasa W.S. (Namber) (Number) Mabasa W.S. (Namber) (Number) Mapasa W.S. (Namber) (Number) (Number) Mapasa W.S. (Namber) (Number)					Proc.	Billings					Revenues		
Diadi Durance W.S Diadi Belance W.S San Luis W.S Villa Aurora W.S Belance W.W.S Binong W.S Belance W.W.S Binong W.S Bergy, Oyao W.S Mabasa W.S Mabasa W.S Mabasa W.S Mabasa W.S Mabasa W.S Mabasa W.S Mabasa W.S Takbaw W.	NEDA	Municipality	Name of System	Annual	Public Faucet	House Connection	Expected Subsidies	Other /	Annual	Payment by Public Faucet	Payment by House Connection	Subsidies	Others
Diadi Duruarog W.S Rosario W.S Rosario W.S San Luix W.S Villa Aurora W.S Simong W.S Simong W.S Simong W.S Simong W.S Simong W.S Simong W.S Mabasa W.S Mabasa W.S Malasin W.S.S Mayputo W.W.S Takbaw W.S Takbaw W.S Takbaw W.S Takbaw W.S Takbaw W.S Simong	Xrappic Xrappic		(Operating Body)		Consumers	Consumers				Consumers	Consumer		
Diadi Dunazeg W.S Rosario W.S San Luis W.S San Luis W.S San Luis W.S Elance W.W.S Birgy, Oyao W.S Lamo W.S Lamo W.S Mabasa W.S Mabasa W.S Mabasa W.S Mabasa W.S Margenia W.S Margenia W.S Margenia W.S Margenia W.S Margenia W.S Margenia W.S Margenia W.S Margenia W.S Margenia W.S Margenia W.S Tigep W.S Tigep W.S Tigep W.S Takbaw W.S Ta	3			(Number)				Ξ	ponsand	(Thousand of Pesos/year)			
Rosano W.S San Luis W.S Villa Aurora W.S Municipal Total Belance W.W.S Bimong W.S Brgy. Oyao W.S Lamo W.S Mabasa W.S Mabasa W.S Mabasa W.S Malasin W.S Malasin W.S Marabonga W.S Takbaw W.	045206	Diadi	Duruarog W.S										
Dupax del Norte Mu Dupax del Sur	· •		Rosario W.S								4944		
Dupax del Norte Mu Dupax del Sur			San Luis W.S										
Dupax del Norte Mu Dupax del Sur			Villa Aurora W.S										
Dupax del Norte Mu		X	unicipal Total										
Dupax del Sur	045207	l	Belance W.W.S					1					
Dupax del Sur		·	Birnong W.S										
Dupax del Sur			Brgy, Ovao W.S										
Dupax del Sur			Inaban W.S										
Mu Dupax del Sur			I amo W.S										
Mu Dupax del Sur			Webses W.S					-					
Mu Dupax del Sur			Macabenga W.S										
Mu Dupax del Sur			Malasin W.S.S										
Mu Dupax del Sur			Mayouto W.W.S										
Dupax del Sur		-A	Menonia										
Dupax del Sur		_	Press: W.C	2	:							ļ	
Dupax del Sur			Part W. C.										
Mun Dupax del Sur			Total	:									
Mun Dupax del Sur	<u></u>		Tiren W.S	-						:			
Mun Dupax del Sur			Yabbi W.S										
Dupax del Sur		Σ	funicipal Total	 -									
	045208		Biruk										
			Gabut R.W.S.S										
			Ganao W.S										
]:			Kinabuan W.S									_	
			Macatheng W.S										
			Palabotan W.S										
Municipal Actai		Σ	Municipal Total										

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

				Billings					Revenues		
Municipality	Name of System (Operating Body)	Annual	Public Faucet Consumers	House Connection Consumers	Expected Subsidies	Other	Annual Income	Payment by Public Faucet Consumers	Payment by House Connection Consumer	Subsidies	Others
		(Number)				ε	housand o	(Thousand of Pesos/year)			
Kasibu	Dine W.S					-					:
	Muta Tribal Council W.S										
	Poblacion Water System					 .					
	Siguem Tribal Council W.S										
	Watwat Tribal Council					-					
X	Municipal Total										
	Ambalata W.S.S										
	Babadi W.S.S										
	Balwanz Reset, Area W.S.S						-				
	Butilao W.S.S										
	Capulang W.S.S										
	Caritas Village W.S										
	Liten W.S.S										
	Lower Tubong W.S										
	Mapayao W.S.S										
	Nanciakan W.S.S										
	Nayao W.S.S										
	Oliweg W.S.S										
	Padang W.S.S										
	Pampang W.S		-								
	Patkiaw W.S.S										
	Salicpan W.S.S										
	San Fabian W.S.S										
	Sayuding W.S.S										
	Tablite W.S.S										
	Talecabcab W.S.S								~		
	Tuppan W.S.S										
	Tuyongan W.S.S										

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

					Office O							
Y CLAN				1	Billings					Revenues		-
ع فِ			-	Public	House	Espected			Payment by	Payment by House		
graphic	Municipality	Name of System (Operating Body)	Annual	7	Connection	Subsidies	Other 1	Ілсоше	Public Faucet Consumers	Consumer	Subsidies	Others
age Code			(Number)				Ð	ousand o	(Thousand of Pesos/year)			
045211	Quezon	Totong W.S					-					
045212	Santa Fe	Baliling W.S.S										
		Bantinan W.S										
		Bayabas W.S.S										
.,		Bollong W.S.S										
		Butao W.S.S										
		Mag-asawang Kahoy W.S.S										
		Mangcate Tribal Council							-	•		-
		Mangga W.S.S					-					
		Melina W.S.S										
		Pacalbo W.S.S										
		Perez Park W.S.S										
		Pulao W.S.S						_				
· 		Salacsac W.S.S										
		Tactac W.S.S										-
		VillaFlores W.S										
	Mu	Municipal Total										
045213	Solano	Dadap W.S.S										
045214	Villaverde	Brgy. Cabuluan W.S.S										
· 		Ocapon W.S.S										
	Mu	Municipal Total										

4.1.5 Level I Facilities

Safe and Unsafe Classification of Level I Facilities

The PHO conducted water quality analysis of samples collected from public and private Level I wells and classified into safe and unsafe sources/facilities.

The results of water quality analysis indicate that about 17% of existing wells in a provincial average are classified unsafe sources. Since the total number of shallow wells (14,843) occupies 91% of the total number of Level I wells (16,297) and the deep well is rarely exposed to contamination by seepage of wastewater, PHO analysis results (unsafe percentages) were applied to classify all shallow wells (drilled and driven) into safe and unsafe sources.

The unsafe percentage of provincial average is applied common to urban and rural areas both for public and private shallow wells. While, those sources other than shallow wells are processed as classified in the questionnaire. Table 4.1.3 presents number of Level I facilities by safe and unsafe classification.

4.1.6 Water Supply Service Coverage

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

Through the quick review of the number of water supply systems/facilities and the number of households derived from questionnaire, it was found that a great number of unserved population would be figured out as a balance between the total population and population with any levels of services (including unsafe facilities) in application of the service level standard for Level I and II. To come up with more realistic service coverage, the unserved population in 1995 was prefixed referring to the profile in 1990 population census data, "Households by Main Source of Drinking Water and City/Municipality." Of the rest of the population those who are not served by Level III and/or II systems were considered to be covered by shared or own use of Level I facilities. The calculation procedure is as follows:

- Service percentage/population of Level III and Level II systems was estimated based on the questionnaire survey results.
- Percentage of unserved population (using undeveloped spring, lake, river, peddler, etc.)
 reported in the 1990 population census was assumed to have unchanged up to present.

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Table 4.1.3 Number of Level I Facilities by Safe and Unsafe Classification

Control (Mater) Type (Mate								Safe Sources	8				-				Unst	Unsafe Sources				_	
Annicologicality Type Spanight Control of Control of Spanight State o	NEDA		1			Public				Pa	vate				P. P. J.	U			Private				3
Mariang Chanalace Chanalace Chanalace Chanalace Chanalace Chanalace Chanalace Chanalace Chanalace Chanalace Chan	Code		Type	Deep	Shallow Well	Covered/ Improved Dug Well		Sub-	Deep	Shallow Well	Covered/ Improved Dug Well	Sub- Total											Yotal
Trial State Colored	24520	A Popero Cosmboda	Urban	Î	0		0		°	0	٥	0	ō	0	0	P	ठ	٥	0	0	0	0	ि
Markegame Cheese 3	William Company	1000	*	Ý		0	Ľ	~	7	0	°	25		٥	0	_		0	0		C4	8	
National Colored Nati			Total	×	8	Ö	•	1_	<u> </u>	4	0		28	-	0	C		-1	0	Ô	1	2	õ
Authoro Unband Sum of the color 0	000310		1	6	°		0		0	0	0		0	0	0	0	0	0	0	٥	٥	-6	°
Arthalo Undeath Constitution O <th>1</th> <td></td> <td>Rura</td> <td>°</td> <td></td> <td></td> <td>30</td> <td> "</td> <td>°</td> <td>0</td> <td>ō</td> <td></td> <td>95</td> <td>0</td> <td>73</td> <td>०</td> <td>71</td> <td>0</td> <td>٠,</td> <td>13</td> <td>×</td> <td>ខ្ព</td> <td>Š</td>	1		Rura	°			30	"	°	0	ō		95	0	73	०	71	0	٠,	13	×	ខ្ព	Š
Remain 31 5 5.26 0 6 6 6 6 6 6 6 5 5 5 5 6 5 6 5 6 5 6 5 6 5 6 5 6 5 5 6 5 6 5 5 6 5 6 5 6 5 6 7			Total	Î	0	:	8		0	°	0		30	0	2	0	53	٥	s	13	18	20	8
Remail 31 15 0 12 56 53 113 0 12 56 53 113 0 43 25 34 0 43 25 34 0 15 0 53 43 36 0 43 43 40 0 43 75 34 0 152 96 150 </td <th>0.5303</th> <td>-</td> <td>Crban</td> <td>T "</td> <td>0</td> <td></td> <td>0</td> <td></td> <td>2</td> <td>256</td> <td>0</td> <td></td> <td>264</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>S.</td> <td>4</td> <td>٥</td> <td>8</td> <td>3</td> <td>S</td>	0.5303	 -	Crban	T "	0		0		2	256	0		264	0	0	0	0	S.	4	٥	8	3	S
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Bambang Urban 3 1 3.4 0 205 824 0 10.029 1.059 6 3 3 1 169 2 141 6 171 183 1.1 Bambang Urban 3 8 0 0 11 1 691 0 6 2 141 0 0 15 141 0 0 15 141 0 0 141 145 16 1 0 0 2 141 0 0 15 141 0 0 0 0 0 141 142 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1,85 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	,		Rurai	°			۶.			530		L.	708	9	6	ત	Ξ	18	ri	٥	Ξ	ži	830
Bayombong Urban 3 8 0 11 1 691 0 2 141 0 0 1 141 143 141 0 0 2 141 0 0 141 143 141 141 141 141 142 <th></th> <td></td> <td>Total</td> <td></td> <td></td> <td></td> <td>ľ</td> <td></td> <td></td> <td></td> <td></td> <td>_</td> <td></td> <td>9</td> <td>.3</td> <td>3</td> <td>12</td> <td>169</td> <td>-61</td> <td>٥</td> <td>171</td> <td>183</td> <td>1,252</td>			Total				ľ					_		9	.3	3	12	169	-61	٥	171	183	1,252
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Bayombong Urban 2 2 0 4 2 3.087 0 3.089 3.093 1 0 0 1 6.32 0 0 0 1 6.32 0 0 0 0 1 6.32 0 0 0 0 0 0 0 0 0 1 6 0			Total	4					<u> </u>	-		1	1	7	Ó	0	7	292	16	0	308	315	1.953
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Total 121 22 0 0 16 39 7 3793 0 3.839 1 0 0 0 1 777 17 17 17 0 0 794 795 4. Diadi Urban 22 1 2 0 1 1 24 15 19 15 19 0 34 58 1 0 0 15 18 1 1 23 0 34 58 Dupax del Norte Urban 4 0 0 0 0 1 1 3 1 3 1 0 0 1 1 1 0 0 1 1 1 0 0 1 1 0 1 1 0 0 1 1 0 1 1 1 0 0 1 1 0 1			Rural	61					,					0	0	0	Ö	145	17	0	162	છ	8
Diadi Urban 21 2 0 1 24 65 18 11 0 11 2 4 0 4 6 Rural 28 14 0 15 57 9 52 0 15 18 11 2 4 0 15 18 11 2 4 0 15 18 11 2 4 0 15 18 11 2 18 11 23 0 15 18 11 2 18 11 2 16 0 15 18 17 0 15 18 0 15 18 2 18 0 18 0 15 18 0 15 18 0 18	<u> </u>		Total	21										1	0	0	-	777	12	0	794	795	4.634
Rural 28 14 0 15 61 118 31 0 15 18 11 23 0 34 52 Dupax del Norte Total 49 16 24 71 0 95 176 4 0 16 20 15 23 0 38 58 Dupax del Norte Urban 8 0 0 1 0 1 0 0 1 0 38 50 Dupax del Norte Urban 8 0 0 0 1 1 0 1 0 0 0 0 32 30 0 203 0 0 0 0 1 1 0 32 30 0	0.15207	1	Crban	18				Ŀ						1	0	-	C3	7	0	0	7	۴	3
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Dupax del Norte Urban 8 0 0 15 124 0 0 2 0 1 4 4 1 2 3 2 3 2 3 2 3 4 1 2 3 3 3 3 3 3 3 3 3 3 3 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3			Total	57		-								4	0	91	20	15	23	Ó	38	\$8	23.3
Rural 2 11 0 22 33 367 240 12 14 42 160 0 202 216 Dupax del Sur Total 10 11 0 23 44 12 311 0 323 367 2 0 14 16 64 176 0 240 256 Dupax del Sur Urban 6 0 0 0 0 0 0 0 0 0 0 0 7 7 7 Rural 10 6 0 13 10 83 0 63 96 1 0 0 1 0 90 1 1 10 90 1 1 11 0 40 53 53 53 53 54 1 1 0 0 1 1 1 0 0 1 1 1 0 0 1 1	0.5208	1	Urban	, ×				٥								72	£3	អ	92	0	38	ទូ	3
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Dupax del Sur Urban ✓ 6 0 0 32 40 0	<u>.</u>		Total	_ 2				-								71	91	ક	176	Ó	340	256	623
Rural 10 6 0 17 33 10 83 0 63 96 1 0 0 1 11 0 40 51 52 Total 16 6 0 1 18 0 40 58 59	045200	_	Urban														0	7	0	0	1-	~	7
65 X5 OT 0 181 1 10 0 1 9E1 56 0 58 01 1T 61 10 9 91 1			Rural	<u> </u>											0	0		Ξ	ō	07	15	52	3
	 -		Total	٤	·										0			18	O	01	×.	\$3	195

Table 4.1.3 Number of Level I Facilities by Safe and Unsafe Classification (Cont'd.)

						Š	Safe Sources	ş								Co	Unsafe Sources	x:				
YED YED		:			Public				Pri	Private				Public	اي.			Private	9			
graphic Code	Municipality	Type	Deep	Shallow Well	Covered/ Improved Dug Well	Developed	Sub- total	Deep	Shallow Well	Covered/ Improved Dug Well	Sub- Total	Total	Shallow Well	Open Dug Well	Unde- veloped Spring	Sub- total	Shallow Well	Open Dug \	Rain Water Collector	Sub- total	Total	Total
045210 Kasibu	Kasibu	Urban	O	0	0	0	С	O	0	0	0	0	0	0	ĺ	0	0	3	0	3	3	3
		Rural		\$	0	58	65	30	146	0	476	\$41	-1	0	~-	2	91	52	143	286	288	829
		Total	7.7	5	0	28	65	30	446	0	176	132	1	0		. 2	16	55.	143	289	291	832
045211	045211 Kayapa	Urban	ō	0	0	7	7	0	0	0	0	7	0	0	O	0	0	0	0	0	0	7
···		Rum	C)		0	54	58	ō	1	0	1	89	1	0	0		.0	0	0	0	1	90
		Total	r1		0	61	65	0	1	0	1	99	1	0	0		0	0	0	0	1	67
Q45212	045212 Quezon	Urban	Q	Ó	0	0	0	0	lo	0	0	0	0	0	.0	0	0	0	0	Ō	0	ō
		Rumi	9	[2]	0	15	33	112	276	0	188	421	2	127	10	130	95	141	0	197	336	757
		Total	9	12	0	15]	33	112	276	0	388	121	2	127	01	139	95	141	0	161	336	757
045213	045213 Santa Fe	Crban	O	63	0	4	9	0	64	ю	£4	8	- 1	0	0		1	jo	0	1	7	10
		Rum	24,	0	0	22	30	0	т.	O	e.	33	0	o	0	0	 -	Ŀ	0	4	4	37
·		Total	3	-72	0	31	9.	0	5	0	Š	41	1	0	0	-1	2	3	0	5	9	47
045214	Solano	Urban	Ċ	9	ঠ	0	9	٥	1.453	0	1,453	1.459	1	0	0		298	0	0	298	299	1.758
		Rura	6.	61	O	٥	Š		2.063	0	2,064	2,153	12	0	O	12	422	4	0	426	438	2.591
2		Total	2	67	0	ŏ	\$	-	3,516	0	3.517	3.612	13	0	0	13	720	4	0	724	737	4.349
045215	045215 Villaverde	Urban	<u>- </u>	(1	0	Ö	4	٥	654	0	654	859	٥	0	0	Q.	134	0	0	35	134	792
		Rural	- (3	25	0	-:-	38.	0	586	0	85	337	S	0		9	61	0	0	61	67	404
		Total	4	27	0	11	42	٥	953	0	953	8	~	0	-	\$	195	ō	0	195	201	1,196
		Crban	ş	24	0	151	85	3	6.596	0	6.690	6.775	9	0	7	101	1.351	23	0	1,374	1,384	8.159
P	Provincial Total	Runal	172	215	0	306	693	49.	5,485	0	5.979	6,672	42	172	4.1	255	1.124	453	196	1.773	2.028	8.700
		Tota!	218	239	0	321	37.8	888	12,081	0	12,669	13,447	30	17.	83	265	2,475	476	8	3,147	3,412	16.859

- Population covered by Level I facilities were calculated as a balance figure between the total population, and the population served by Level III & II systems and the unserved population.
- Level I population coverage was estimated in assumption that 50% of the private facilities were shared by neighbors.

Unserved population and the population covered by Level I facilities are presented in Table 4.1.4. Table 4.3.5 presents overall population covered by Level I facilities and number of households.

Number of households per shared public/private facility ranges from 1 to 15 households, which are considered within the reasonable level, as more or less equivalent to the service level standard of Level I public facility (15 households/facility) and Level II system (5 household/public faucet).

Table 4.1.4 Estimation of Unserved Population by Municipality

14.25			Population	ation	d				Unserved Population	pulation		Population
Se s	<u> </u>		. and		yer	Served Fobulation	C	Unser	Unserved Percentage (1990)	(06	Unserved	Covered by
graphic	Municipality		Househo	old Size	Level	Level	Total	Total No.	Number of	ţ\$	Population	Level I
Sode			Number	HH Size	ш	ш		of HHs	Unserved MHs		(1995)	Facilities
045201	Alfonso Castañeda	Urban	O	0.0	0	0	0	0	0	0.0	0	Ö
		Rural	4,344	5.3	0	1.890	1.890	210	298	42.0	1.823	631
		Total	4.344	5.3	0	1.890	1.890	710	298	42.0	1.823	631
045202	Ambaguio	Urban	0	0'0	0	0	0	0	0	0.0	10	٥
	•	Rural	9.923	5.6	0	603	603	1.294	1.081	83.5	8,290	1.030
		Total	9,923	5.6	0	603	603	1,294	1.081	83.5	8,290	1.030
045203	Aritao	Urban	11,204	5.2	1,626	0	1.626	1.990	6	0.5	53	9.527
		Rural	16.964	5.2	708	2,633	3,341	3.030	591	19.5	3,309	10,314
		Total	28.168	5.2	2.334	2.633	4.967	5,020	009	12.0	3,360	19.841
045204	Bagabag	Urban	14.942	5.3	2.035	0	2,035	2,336	3	0.1	19	12,888
		Rural	14,310	5.1	0	954	954	2.668	202	7.6	1.083	12.273
		Total	29.252	5.2	2,035	954	2,989	5,004	205	4.1	1.102	25.161
045205	Bambang	Urban	13,190	5.0	0	0	0	2,353	9	0.3	34	13.156
	1	Rural	24.974	5.1	0	1.258	1,258	4.322	359	8.3	2.074	21.642
		Total	38,164	5.0	0	1,258	1.258	6,675	365	5.5	2.108	34.798
045206	Bayombong	Urban	25.140	5.6	6.599	275	6.874	4,267	4	0.1	24	18,242
	·	Rural	19,643	4.4	2,268	0	2.268	3.712	217	5.8	1.148	16.227
		Total	44.783	5.0	8.867	275	9.142	7.979	221	2.8	1,172	34,469
045207	Diadi	Urban	1.931	5.3	0	Ö	0	312	1	2.2	43	1.888
		Rural	11.107	5.2	0	450	450	1.873	410	21.9	2,431	8.226
		Total	13.038	5.2	0	450	450	2,185	417	19.1	2.474	10.114
045208	Dupax del Norte	Urban	6.084	1.5	0	1.250	1,250	1,119	18	1.6	86	4,736
		Rural	17,316	5.1	0	2,996	2.996	2.953	1.056	35.8	6.192	8.128
		Total	23,400	5.1	0	4,246	4.246	4.072	1.074	26.4	6,290	12,864

Table 4.1.4 Estimation of Unserved Population by Municipality (Cont'd.)

										1.4		Donntation
NEDA			Population	ation	3	Sorved Population	5		Unserved ropmanon	pulation		Lopardor
ę		ţ	anc	'	5	rea robman	:	Unser	Unserved Percentage (1990)	(Q)	Unserved	Covered by
graphic	ivanicipanty.	y dá'	Househo	old Size	Level	Level	Total	Total No.	Number of	18	Population	Level I
Code			Number	HH Size	ш	n		of HTHS	Unserved HHs		(1995)	Facilities
045209	Dupax del Sur	Urban	3.423	5.4	0	0	0	297	17	2.8	76	3.326
		Rural	10,505	5.4	0	1.407	1.407	1.675	056	56.7	5,958	3.140
		Total	13,928	5.4	0	1,407	1.407	2.272	196	42.6	6,055	6,466
045210	Kasibu	Urban	0	0.0	0	0	0	0	0	0.0	0	O
		Rural	25,581	5.2	0	1.377	1.377	4,151	3,084	74.3	19,005	5,199
		Total	25,581	5.2	0	1.377	1.377	4,151	3.084	74.3	19,005	\$.18
045211	Kayapa	Urban	744	5.4	0	<i>1</i> 99	667	125	31	24.8	77	δ
		Rural	20,119	5.4	0	4.586	4,586	3,365	1.804	53.6	10,786	4.747
		Total	20.863	5:4	0	5,253	5.253	3,490	1,835	52.6	10,863	4.747
045212	Quezon	Urban	Ó	0.0	٥	0	0	0	0	0.0	0	Ö
		Rural	13,681	5.1	0	26	26	2,408	929	28.1	3.841	9,748
		Total	13,681	5.3	0	92	26	2,408	929	28.1	3,841	9.748
045213	Santa Fe	Urban	1,366	5.7	0	0	0	227	17	7.5	102	1.264
		Rural	11.216	5.2	0	3.527	3,527	1.669	626	58.3	6,539	1.150
		Total	12.582	5.2	0	3,527	3.527	1.896	066	52.2	6,641	2.414
045214	Solano	Urban	27.494	5.0	4.970	001	5.070	5.257	3	0.1	16	22,408
		Rural	21.282	5.0	0	858	\$58	3.616	182	5.0	1.071	19.653
		Total	48.776	5.0	4.970	658	5.628	8.873	185	2.1	1,087	42.061
045215	Villaverde	Urban	4,300	5.5	0	0	0	680	3	0.4	61	4.281
		Rural	11.064	5.3	. 0	239	239	1.849	182	9.8	1.089	9.736
		Total	15.364	5.4	0	239	239	2.529	185	7.3	1.108	14,017
		Urban	109.818	5.2	15.230	2:292	17.522	19,263	118	9.0	580	91.716
<u>e</u> .	Provincial Total	Rural	232.029	5.1	2.976	22,570	25,546	39,295	12,065	30.7	74,639	131.844
		Total	341.847	5.1	18.206	24.862	43.068	58.558	12.183	20.8	75,219	223.560

Table 4.1.5 Estimation of Population Covered by Safe and Unsafe Source by Municipality

							SIRECL I								
NEDA			Pop.			Number of Facilities	Facilities				_	Coverage of Own Use	f Own Use		
Geo- graphic	Municipality	Type	Covered by Level I	Pub	Public Facilities	ie.	Př	Private Facilities	ies	Number	Number of Private Facilities	Facilities	(1) Pop	(1) Population Covered	vered
Code			Facilities	Safe	Unsafe	Total	Safe	Uncafe	Total	Safe	Unsafe	Total	Safe	Unsafe	Total
045201	Alfonso Castañoda	Urban	0	0	٥	0	0	0	0	0	0	0	0	0	ठि
		Rural	631	22	1	23	9	1	7	3	30 mail	4	16	3	19
		Total	631	22	1	23	9	1	7	3	1	4	16	3	19
045202	Ambaguio	Urban	0	0	0	0	O	0	0	0	0	٥	O	O	0
		Rural	1.030	30	2	32	O	18	18	0	9	6	0	50	50
		Total	1,030	30	2	32	0	18	18	0	6	6	0	05	50
045203	Aritao	Urban	9.527	3	0	3	261	98	317	131	28	159	629	146	825
		Rural	10.314	88	43	101	166	53	219	83	27	110	432	138	570
		Total	19.841	19	43	104	427	109	536	214	55	268	1111	284	1.395
045204	Bagabag	Urban	12,888	. 3	I	4.	358	09	418	179	30	505	676	159	1.108
		Rural	12,273	37	11	48	671	111	782	336	56	391	1.711	283	1.994
		Total	25,161	40	12	52	1.029	171	1,200	515	86	009	2.660	442	3,102
045205	Bambang	Urban	13,156	11	2	13	692	141	833	346	. 71	417	1.730	353	2.083
		Rural	21.642	73	5	78	862	157	1.029	431	84	515	2,198	426	2,624
		Total	34,798	84	7	91	1.554	308	1.862	777	155	931	3.928	779	4,707
045206	Bayombong	Urban	18,242	4		5	3.089	632	3,721	1,545	316	1.861	8.649	1.770	10,419
		Rural	16.227	35	0	35	711	162	873	356	81	437	1.564	356	1.920
		Total	34,469	39	1	40	3.800	794	4.594	1.901	397	2.297	10.213	2.126	12.339
045207	Diadi	Urban	1.888	24	2	26	34	4	38	17	2	61	06	11	101
		Rural	8,226	57	18	75	61	34	95	31	17	48	159	88	247
		Total	10.114	81	2	101	95	38	133	48	19	67	249	8	348
045208	Dupax del None	Urban	4,736	6	2	11	115	38	153	58	19	77	293	65	390
		Rural	8.128	35	14	49	208	202	410	104	101	205	530	515	1,045
		Total	12,864	44	16	09	323	240	595	162	120	282	823	612	1.435

Table 4.1.5 Estimation of Population Covered by Safe and Unsafe Source by Municipality (Cont'd.)

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						S	Sheet I								
NEDA			Pop.			Number of Facilities	Facilities					Coverage of Own Use	f Own Use		
Geo- graphic	Municipality	Type	Covered by Level I	[nd	Public Facilities	8	Priv	Private Facilities	ies	Number	Number of Private Facilities	acilities	(I) Pop	(1) Population Covered	vered
<u>క</u>			Facilities	Safe	Unsafe	Total	Safe	Unsafe	Total	Safe	Unsafe	Total	Safe	Unsafe	Total
045209	Dupax del Sur	Urban	3,326	8	0	8	32	7	39	16	4	20	86	19	105
	*	Rural	3,140	33	1	\$.63	51	114	32	26	57	170	138	308
		Total	6,466	41	1	42	95	58	153	48	30	7.7	256	157	413
045210	Kasibu	Urban	0	٥	0	0	0	3	3	0	2	2	0	0	Ö
		Rural	5,199	65	2	67	476	286	762	238	143	381	1.238	744	1.982
		Total	5.199	65	2	. 67	476	289	765	238	145	383	1.238	744	1.982
045211	Kayapa	Urban	0	7	0	7	0	0	0	0	0	0	0	0	O
ì, p.,		Rutal	4,747	58	1	59	1	0	11	1	0	1	3	jo	3
		Total	4.747	65	1	99	1	0	1	1	0.	1	3	0	3
045212	Quezon	Urban	0	0	0	0	0	0	0	0	0	0	0	0	O
-;-		Rural	9.748	33	139	172	388	161	585	194	66	293	686	502	1.491
		Total	9.748	33	139	172	388	161	585	194	66	293	686	502	1.491
045213	Santa Fc	Urban	1.264	9	1	7	2		3	1	1	2	9	3	6
·		Rural	1.150	30	0	30	3	4	7	2	2	7	8	101	18
		Total	2,414	36	1	37	\$	5	01	3	3	5	14	13	27
045214	Solano	Urban	22,408	9	1	7	1,453	298	1.751	727	149	876	3.633	745	4.378
	•	Rural	19.653	89	.12	101	2.064	426	2.490	1.032	213	1.245	5.160	1.065	6.225
		Total	42,061	95	13	108	3.517	724	4.241	1,759	362	2,121	8,793	1,810	10.603
045215	Villaverde	Urban	4.281	4	0	4	654	134	788	327	67	394	1.799	369	2.168
	1 2	Rural	9.736	38	9	44	299	61	360	150	31	180	792	162	954
		Total	14,017	42	. 6	48	953	195	1.148	477	86	574	2.591	531	3,122
		Urban	91.716	85	01	95	069'9	1,374	8.064	3,347	689	4.036	17.914	3.672	21.586
S.	Provincial Total	Rural	131,844	693	255	876	5.979	1.773	7.752	2,993	068	3.880	14,970	4.480	19.450
		Total	223.560	778	265	1.043	12,669	3,147	15.816	6,340	1.579	7.916	32,884	8.152	41.036

Table 4.1.5 Estimation of Population Covered by Safe and Unsafe Source by Municipality

						Si	Sheet 2									
NEDA			Pop.	:		Cove	Coverage of Shared Use	red Use				7	Level I Coverage	verage		
Š	Municipality	2	Covered by	(2) Popi	(2) Population Covered by	ered by	Numb	Number of Households	a Pic	No. of HTHS			(1) + (2)	<u>3</u>		
zraphic .		ξ.	Level I	Pub	Public and Private	ate		100		per Shared	Safe		Unsafe		Total	Į,
Š			Facilities	Safe	Unsafe	Total	Safe	Unsafe	Total	Facility	Pop.	%	Pop.	%	Pop.	%
045201	Alfonso Castañoda	Urban	0	0	0	0	О	0	0	0	0	0	0	0	0	°
		Rurai	631	577	35	612	109	7	116	4	593	14	38	1	631	15
		Total	631	577	35	612	601	7	116	4	593	14	38	1	631	15
045202	Ambaguio	Urban	0	0	0	0	0	0	0	0	0	0	0	0	0	٥
45.4		Rural	1,030	717	263	086	128	47	175	4	717	7	313	3	1.030	10
		Total	1.030	717	263	086	128	47	175	7	717	7	313	3	1.030	10
045203	Aritao	Urban	9.527	7.193	1.509	8.702	1.383	290	1,673	10	7.872	70	1.655	15	9,527	85
		Rural	10.314	6.527	3,217	9,744	1.255	619	1.874	9	6.959	41	3.355	20	10,314	61
	u-1-71	Total	19.841	13,611	4.726	18,446	2.638	606	3.547	10	14.831	53	5.010	81	19.841	70
045204	Bagabag	Urban	12,888	10.066	1.714	11,780	1,899	323	2.222	10	11.015	74	1.873	13	12.888	98
		Rural	12,273	8,722	1.557	10.279	1,710	305	2.015	5	10,433	73	1.840	13	12.273	86
		Total	25.161	18.760	3,271	22.059	3.609	628	4.237	9	21,448	73	3,713	13	25.161	86
045205	Bambang	Urban	13,156	9,204	1,869	11,073	1,841	374	2,215	5	10,934	83	2,222	12	13,156	100
		Rural	21.642	16.177	2,841	19.018	5.172	557	3.729	9	18,375	74	3,267	13	21.642	87
		Total	34.798	25.351	4.710	30,091	5,013	931	5.944	9	29.309	77	5.489	14	34,798	91
045206	Bayombong	Urban	18,242	6,494	1,329	7.823	1.160	237	1,397	1	15.143	9	3.099	12	18.242	73
		Rurai	16.227	11,849	2,458	14.307	2.693	559	3,252	7	13,413	89	2.814	14	16,227	83
		Total	34,469	18,361	3,787	22,130	3.853	796	4.649	2	28.556	64	5.913	:3	34,469	11
045207	Diadi	Urban	1.888	1.628	159	1.787	307	30	337	7	1.718	68	170	6	1.888	98
	·	Rural	8.226	5,699	2.280	7.979	1.096	438	1,534	13	5.858	53	2,368	21	8,226	74
		Total	10.114	7,492	2,439	9.766	1,403	468	1.871	11	7.576	58	2.538	61	10,114	78
045208	Dupax del Norte	Urban	4,736	3,303	1.043	4.346	648	205	853	10	3.596	65	1.140	61	4,736	78
		Rural	8.128	3.876	3.207	7.083	760	629	1,389	5	4,406	25	3.722	21	8.128	47
		Total	12.864	6.877	4,250	11,429	1.408	834	2,242	7	8.002	34	4.862	21	12,864	55

Table 4.1.5 Estimation of Population Covered by Safe and Unsafe Source by Municipality (Cont'd.)

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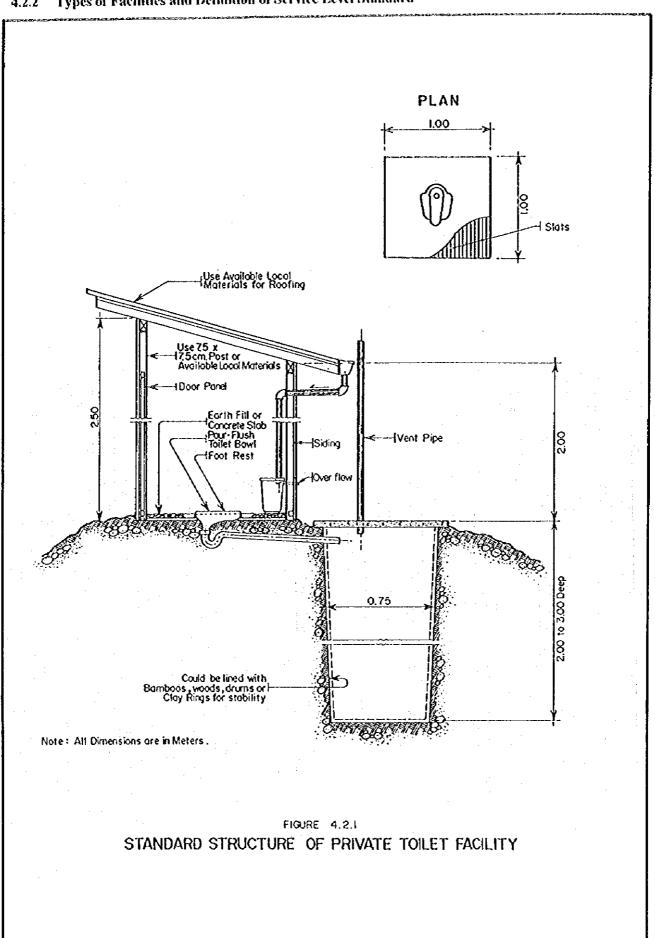
						Š	Sheet 2									
NEDA			Pop.			Cove	Coverage of Shared Use	red Use				1	Level I Coverage	verage		
9	Municipality	Type	Covered by	(2) Pop	(2) Population Covered by	ered by	Numbe	Number of Households	3614	No. of HHs			(1) + (2)	3		
graphic	•		Level I	Pag	Public and Private	/ate	7011111	t or trouser	CTION CO.	per Shared	Safe		Unsafe		Total	
Code			Facilities	Safe	Unsafe	Total	Safe	Unsafe	Total	Facility	Pop.	%	Pop.	F ₀	Pop.	2%
045209	Dupax del Sur	Urban	3.326	2.811	410	3,221	521	9/	597	22	2,897	15	229	=======================================	3.326	16
		Rural	3,140	2.007	825	2:832	372	153	525	9	2.177	21	963	6	3.140	Į ģ
		Total	6,466	4,521	1,235	6.053	893	229	1,122	6	5.074	38	1.392	2	9,466	139
045210	Kasibu	Urban	0	0	0	0	0	0	0	0	0	0	0	0	0	6
		Rural	5.199	2,176	9.1	3.217	418	200	819	1	3,414	13	1.785	7	5.199	ន
		Total	5.199	2.169	1.041	3.217	418	200	618		3,414	13	1.785	-	5.199	2
045211	Kayapa	Urban	0	0	0	0	0	0	0	0	0	Ó	ō	0	ō	ō
		Rural	4.747	4.664	80	4,744	864	15	879	15	4.667	23	08	0	4,747	13
		Total	4.747	4.673	80	4.744	864	15	879	13	4.667	22	08	0	4.747	23
045212	Quezon	Urban	0	0	0	0	0	0	٥	0	0	0	ó	0	ő	ि
		Rural	9,748	4.035	4.222	8.257	791	828	1.619	3	5.024	37	4,724	35	9.748	7
		Total	9.748	4.035	4.222	8,257	791	828	1.619	3	5.024	37	4.724	35	9.748	7.
045213	Santa Fe	Urban	1.264	1.034	221	1,255	181	39	220	26	1.040	76	224	19	1,264	<u> </u>
		Rural	1.150	1.064	89	1,132	205	13	218	7	1.072	2	78	-	1,150	<u> </u>
		Total	2,414	2.188	289	2.387	386	52	438	10	2.112	1.7	302	77	2,414	Ē
045214	Solano	Urban	22.408	14,965	3.065	18.030	2.993	613	3.606	4	18,598	89	3,810	4.	22.408	8
		Rural	19,653	11.183	2.245	13,428	2,237	449	2.686	2	16.343	1	3,310	5	19,653	\$
		Total	42,061	26.164	5.310	31.458	5.230	1.062	6.292	3	34,941	72	7.120	Šį	15.061	8
045215	Villaverde	Urban	4.281	1.757	356	2.113	319	65	384		3,556	83	725	17	4.281	Š
		Rural	9.736	7.351	1,431	8.782	1.387	270	1.657	7	8.143	74	1.593	22	9.736	88
		Total	14.017	9.082	1.787	10.895	1.706	335	2.041	3	11,699	76	2,318	15	14.017	Ę
		Urban	91.716	58.455	11.675	70.130	11,252	2.252	13.504	3	76,369	70	15.347	7	91.716	84
Pro	Provincial Total	Rural	(31,844	86.624	25,770	112,394	17.197	5.089	22.286	\$	101.594	4	30.250	13	131.844	٤,
ļ		Total	223.560	145.079	37.445	182,524	28.449	7,341	35,790	1	177.963	1	45.597	13 2	223.560	3

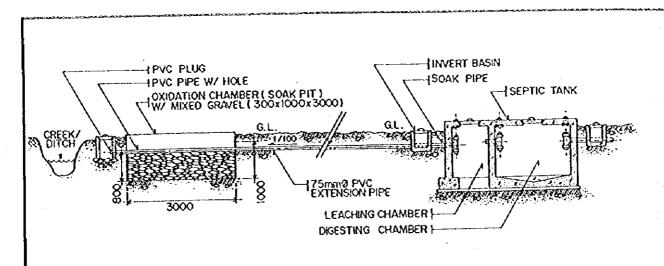
4.2 Sanitation and Sewerage

SOURCE +

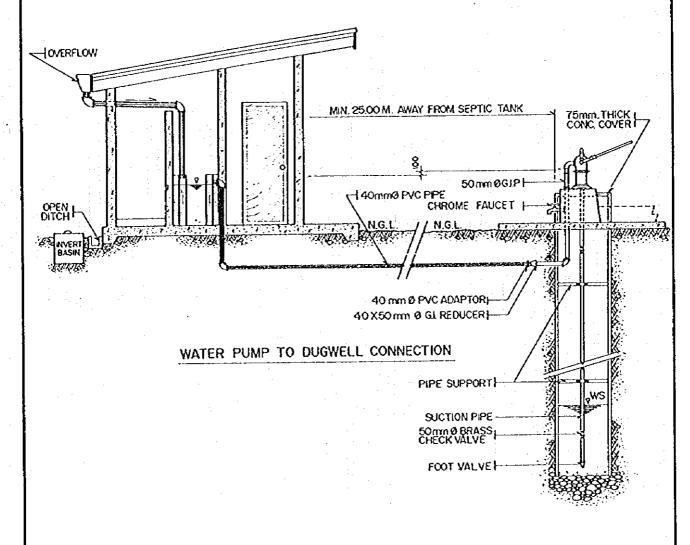
DEPARTMENT OF HEALTH

4.2.2 Types of Facilities and Definition of Service Level Standard





LAYOUT PLAN OF HIGH GROUND WATER SITE



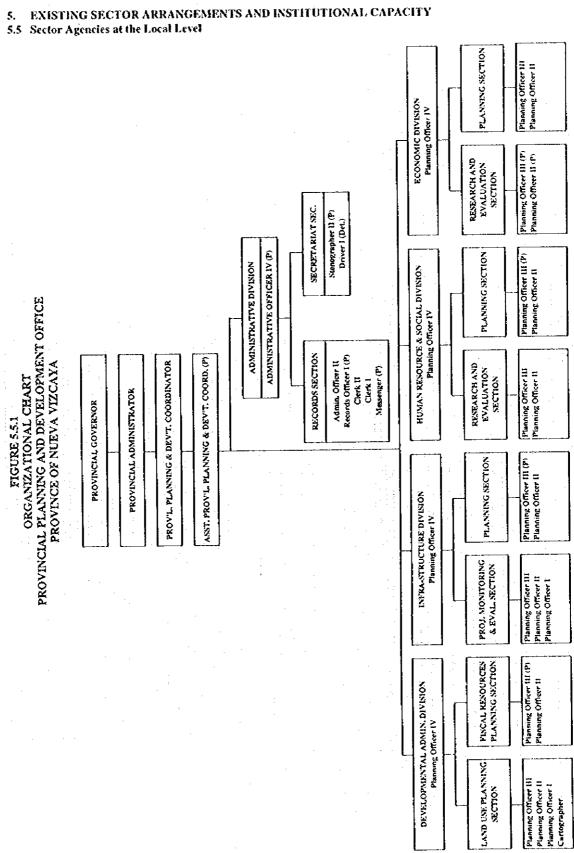
STANDARD STRUCTURE OF SCHOOL TOILET FACILITY

SOURCE : JICA - DPWH RURAL ENVIRONMENTAL SANITATION PROJECT .

4.2.3 Sanitation Facilities and Service Coverage

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

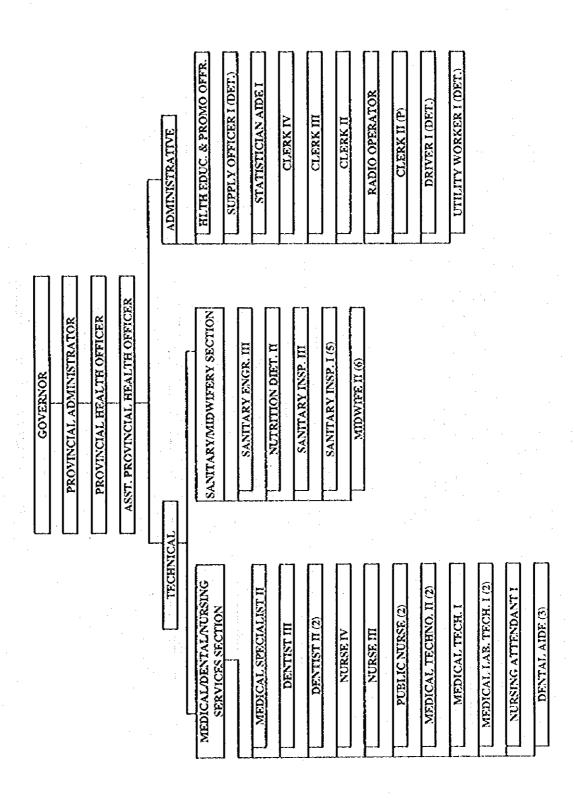
	i			11	ouseholds S	Served	by Sanitar	y Toil	ets		Unders	erved/	Unserved I	His
Municipality	Туре	HHs No.	Flas!		Pour Fl		VIP	-	Total)	Unsani	tary	No Faci	ility
Municipality	',,,,	1995	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Alfonso Castañeda	Urban	o	0	0	0	0	0	Ó	o	0	0	0	0	()
Assemble assured	Rural	822	ř	. 0	-	41	137	17		58	227	28	117	14
	Total	822	0	6	341	41	137	17	478	58	227	28	117	14
1 mhanuis	Urbon	022	0	0		0	0	0	0	0	0	0	0	
Ambaguio			0	0		. 9	541	31	705	40	336		732	- 41
	Rural	1,773	- 0	0		9	541	31	705	40	336	•	7.32	41
	Total	1,773		2		78	341			80	130	6	306	14
Aritao	Urban	2,164	50			67		0		67	415	13	657	20
	Roral	3.287		0			0	0		72	545	10		18
	Total	5,451	55		3,888	71	0	9		91	121	5	107	40
Bagabag	Urban	2,799	58		2,249	80	264						302	11 11
	Rural	2,816	. 0	0		70	192	. 7	· I	77	358	32		,,
	Total	5,615	58	<u>-</u>	4,213	75	456	8		84	479	9	409	
Bambang	Urban	2,623	58	· - 2	2,129	81	. 0	0	2,187	8.3	121	5	315	12
	Rural	4,944	14	0	7.7717	68	358	7		75	642	13	576	12
	Total	7,567	72		5,483	72	358	5	5,913	78	763	10	-	12
Bayombong	Urban	4,522	153	3	3.812	84	24	: 1		88	158	- 4	375	8
	Rural	4,511	26	i	2,526	56	143	3	2,695	. 60		14		26
	Total	9,033	179		6,338	: 70	167	2		74	804	- 9		17
Diadi	Urban	366	. 0	0	124	34	117	32	I 1	65	75	20	50	14
٠	Roral	2,144	0	O		38	333	16	l l	54	218	1		36
	Total	2,510	0	0		37	450	18		55	293		826	33
Dupay del Norte	Urban	1,184	0	0		93	. 0	Ü	1,097	93	.48	- 4	39	.3
	Rural	3,374	0	0	2,960	88	0	. 0	2,960	88	184	,		7
	Total	4,558	0	0	4,057	89	. 0	0	4,057	. 89	232	5	269	: 6
Dupax del Sur	Urban	632	6	ı	622	98	0	. 0	628	99	4	۱ ا	0	- 0
	Rural	1,942	0	0	802	41	85	4	887	45	159	8	895	47
	Total	2,574	- 6	0	1,424	55	85	3		58	163	6	895	36
Kasibu	Urban	C	0	0	: .0	. 0	0	0	0	: 0	. · · · · · · · · · · ·] 0	0	0
	Rural	4,956	0	0	2,101	. 42	663	. 13	2,767	55	1,652	:, 34	537	- 11
	Total	4,956	0	0	2,103	42	663	13	2,767	55	1,652	34	537	- 11
Kayapa	Urban	139	4	3	135	97	0	0	139	100	0	0	O	(I
·.	Rural	3,757	. 2	. 0	1,315	35	387	.10	1,704	45	361	10	1,592	45
	Total	3,896	6	0	1,450	37	: 387	10	1,843	47	. 361	9	1,692	44
Quezon	Urban	0	0	0	. 0	0	0	0	0	0	0	0	0	U
	Rural	2,699	0	0	1,268	47	707	26	1,975	73	421	16	303	13
	Total	2,699	0	0	1,268	47	707	26	1,975	73	421	16	303	11
Santa Fe	Urban	239	25	10	155	65	8	. 3	188	78	12	5	39	17
	Rural	2,161	0	€	888	41	190	9	1,078	50	539	25	544	25
	Total	2,400	25		1,043	43	198		1,266	52	551	23	583	25
Solano	Urban	5,539	358	6	3,838	69	646	12		. 87	318	. 6	379	7
	Rutat	4,240	7		3,396	80	364	, ,	3,767	89	363	8	110	3
	Total	9,779	365	4	7,234	74	1,010	10	8,609	88	681	7	489	5
Villaverde	Urban	778	25	.3	650	84	. 0	C	675	87	28	4	75	9
	Rural	2.080	1	1	939	45	480	23	1,433	69	366	18	2×1	13
	Total	2,858		1	1,589	56	480	17		74	394	14	356	12
	Urban	20,985			 					87			1.685	,
Provincial Total	Rural	45,500	1		25,048	•		1			l .		l	ł .
	Total	66,491		1	41.537	1 -		1						i



Engineer II (P)
Engineering Asst.
Gen, Maint, Foreman
(2 existing) Maintenance Foreman Maintenance Capataz (6 existing)
Maintenance Man
(26 existing) NORTH SECTION MAINTENANCE DIVISION Engineer IV PLANNING & PROGRAM DIVISION Architect III
Geodetic Engineer II
Enerrical Engineer I (P)
Engineer I (P)
Engineer I (P)
Engineer I (P)
Engineer I (P) Gen. Maint, Foreman Maintenance Foreman Maintenance Coputaz (3 existing)
Maintenance Man
(23 existing) SOUTH SECTION Engineering Asst. Engineer II (P) Engineer IV ORGANIZATIONAL CHART PROVINCIAL ENGINEER'S OFFICE PROVINCE OF NUEVA VIZCAYA PROVINCIAL ADMINISTRATOR ASST. PROVINCIAL ENGINEER PROVINCIAL GOVERNOR PROVINCIAL ENGINEER SPECIAL PROJECTS SECTION FIGURE 5.5.2 ADMINISTRATIVE STAFF Accounting Clerk (Det.) Engineer II (P) Engineering Asst. (P) Admin, Officer IV Clerk IV Clerk III Clerk III BLDGS, SHEDS IRRL DAMS CONSTRUCTION DIVISION Engineer IV MONITOKING SECTION Engineering Asst. (P) Engineering Asst. (P) Engineering Asst. Engineer III Engineer I (P) Engineer II (P) SECTION QUALITY CONTROL & MONITORING DIVISION Engineer IV QUALITY CONTROL SECTION ROADS & BRIDGES SECTION Engineer III Engineer I (P) Engineering Axst. (P) Engineer III Lab. Technician Laboratory Aide



FIGURE 5.5.3
ORGANIZATIONAL CHART
PROVINCIAL HEALTH OFFICE
PROVINCE OF NUEVA VIZCAYA



6. PAST FINANCIAL PERFORMANCE IN WATER SUPPLY AND SANITATION

6.2 Past Public Investment

Table 6.2.1 Past Internal Revenue Allotment to Municipalities in Nueva Vizcaya Province in 1990-94

		·		=	Unit: Pesos
	1990	1991	1992	1993	1994
I. IRA to All Municipalities	2.054.603.475	4 046 032 743	7,127,522,550	12,484,800,000	16,325,288,074
(National Total)	3,054,601,475	4,046,837,742	7,127,322,330	12,464,000,000	10,323,286,074
If IRA to Municipalities	:				
Total	24,961,115	33,014,294	65,407,599	112,865,620	145,765,170
Alfonso Castaneda	1,045,377	1,440,102	3,867,584	6,656,801	8,331,975
2. Ambaguio	790,804	1,184,568	2,990,091	5,019,821	6,392,022
3. Aritao	1,976,892	2,544,905	4,817,201	8,351,006	10,913,964
4. Bagabag	1,763,735	2,333,784	4,339,577	7,460,924	9,701,824
5. Bambang	2,412,330	3,242,970	5,827,712	10,237,915	13,249,796
6. Bayombong	2,309,451	3,040,151	5,034,351	8,746,957	11,636,212
7. Diadi	1,272,776	1,652,549	3,272,897	5,509,418	7,164,803
8. Dupax del Norte	1,778,737	2,389,800	4,931,551	8,592,703	11,010.638
9. Dupax del Sur	1,606,865	2,124,047	4,465,250	7,768,040	9,855,871
10. Kasibu	1,691,689	2,393,127	4,752,481	8,346,498	10,497,204
11. Kayapa	2,458,845	2,869,237	5,580,334	9,798,147	12,452,329
12. Quezon	1,130,622	1,498,910	3,349,089	5,566,205	7,257,979
13. Santa Fe	1,207,600	1,713,617	3,971,742	6,748,255	8,678,337
14. Solano	2,546,057	3,287,216	5,378,724	9,359,753	12,216,634
15. Vilta Verde	969,335	1,299,311	2,829,015	4,703,177	6,405,582
III Shares (%) in national total			· · · · · · · · · · · · · · · · · · ·		
III Shates (26) in national total					1
Total	0.817	0.816	0.918	0.904	0.893
1. Alfonso Castaneda	0.034	0.036	0.054	0.053	0.051
2. Ambaguio	0.026	0.029	0.042	0.040	0.039
3. Aritao	0.065	0.063	0.068	0.057	0.067
4. Bagabag	0.058	0.058	0.061	0.060	0.059
5. Bambang	0.079	0.080	0.082	0.082	0.081
6. Bayombong	0.076	0.075	0.071	0.070	0.071
7. Diadi	0.042	0.041	0.046	0.044	0.044
8. Dupax del Norte	0.058	0.059	0.069		0.067
9. Dupax del Sur	0.053	0.052	0.063	0.062	
10. Kasibu	0.055	0.059	0.067	0.067	
11. Kayapa	0.080	0.071	0.078		1
11. Kayapa 12. Quezon	0.037	0.037	0.047	0.045	
12. Quezon 13. Santa Fe	0.040	0.042	0.056		
13. Santa re 14. Solano	0.083	0.042	0.075		
14. Solano 15. Villa Verde	0.032		0.040		

Sources: (1) Department of Budget and Management and (2) Bureau of Local Government Finance (DOF)

7. WATER SOURCE DEVELOPMENT

7.3 Groundwater Sources

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7.3.2 Groundwater Availability in the Province

(1) Major Information and References

The Groundwater Availability Map was prepared using the following information and references (detailed list of references is presented in Table 7.3.1, Data Report):

- Administrative and Topographical Maps of the Province published by NAMRIA with scale of 1:150,000 and 1:50,000, respectively.
- Geological Map of the Philippines published by then BMGS with a scale of 1:1,000,000.
- Water Resource Investigation conducted by NWRB, 1986.
- Well Inventory Database prepared by NWRB, LWUA, DPWH.
- Well Inventory Database in the province.

(2) Approach and Methodology

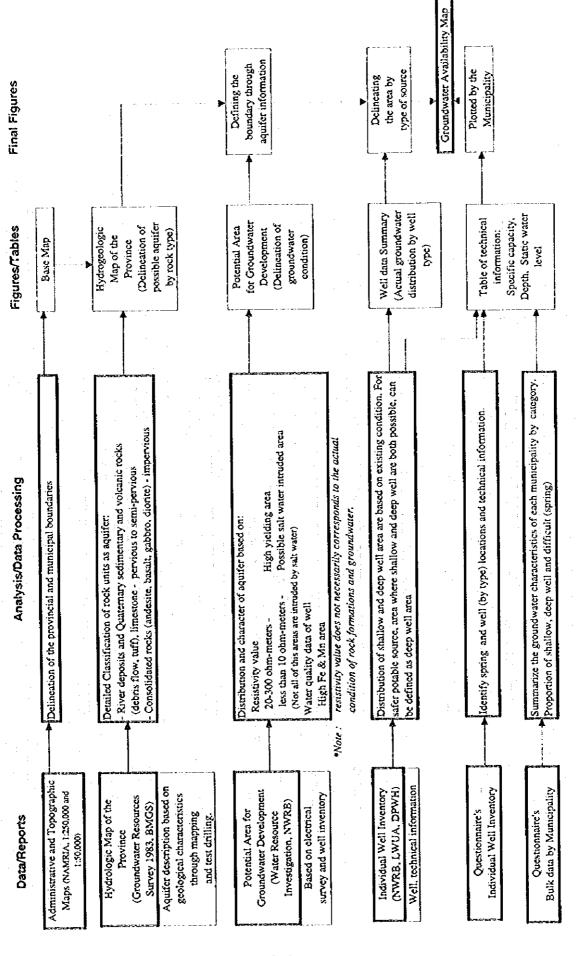
The procedure in preparing the Groundwater Availability Map is explained below with work flow depicted in Figure 7.3.1.

- Prepare a base map with a scale of 1:400,000. The Administrative Map of NAMRIA (1:150,000) is used as reference map and details are verified from the Topographical Map (1:50,0000). Basic information including rivers and provincial and municipal boundaries are indicated in the prepared base map.
- 2) The groundwater potential areas, based on the geology of the province, are delineated on the base map. The Recent alluvial and/or beach deposits, Pliocene-Pleistocene rocks (sandstone, conglomerate and volcanic pyroclastics) and Miocene sediments are regarded as possible aquifers considering their high porosity and permeability relative to older formations.

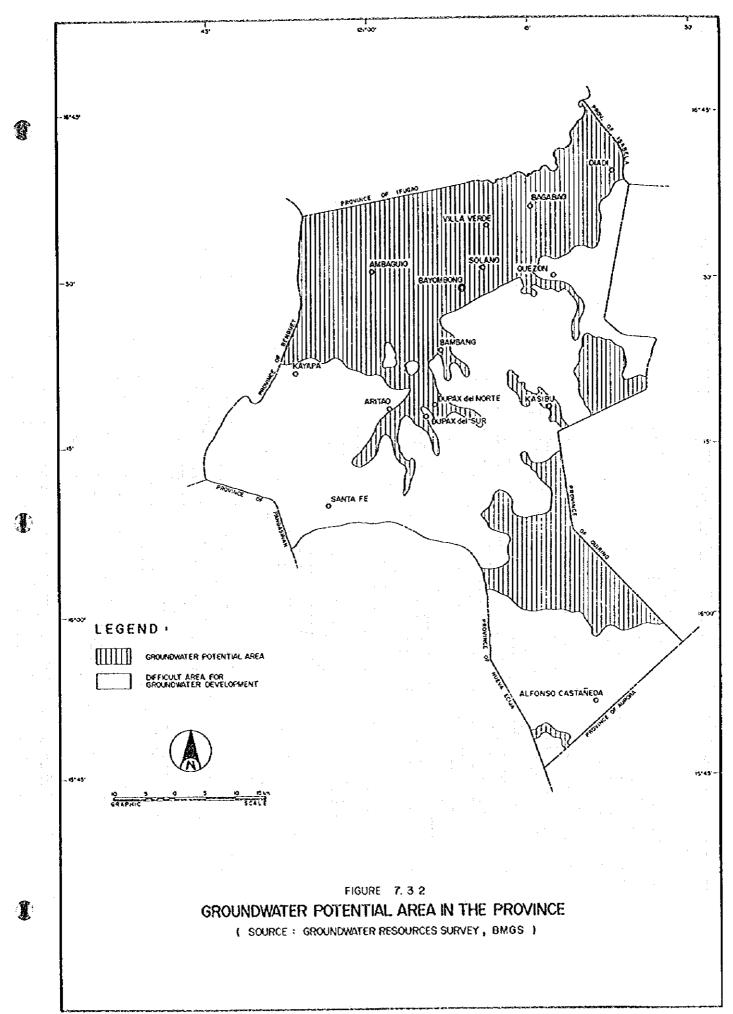
Aside from the defined boundaries of the areas underlain by pervious or groundwater bearing formations, difficult areas for the groundwater development are also delineated as presented in Figure 7.3.2.

3) Areas with potential high yielding aquifer and/or with saline water problem, as established in the Water Resources Investigation of NWRB, is reflected in the defined groundwater potential areas.

Figure 7.3.1 WORK FLOW OF GROUNDWATER AVAILABILITY MAP



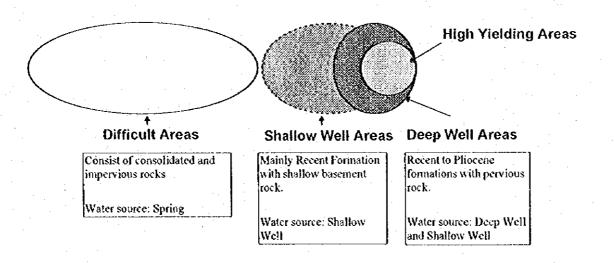
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Considering the results of geo-electrical survey of the above investigation, resistivity values of more than 12 ohm-meter indicate a potential high yielding formation. Values less than 6 ohm-meters meters suggest clayey layer or saturated formation with high salinity. Figure 7.3.3 shows the boundaries of areas with high and low yielding aquifers, and high chloride concentration. In addition, considering the results of water quality examination of wells, areas with high iron and manganese contents are indicated on the map.

4) Delineate shallow and deep well areas based on the well inventory in each municipality (refer to Table 7.3.1, Data Report) and rock distribution. Figure 7.3.4 presents the categorization in terms of groundwater utilization.

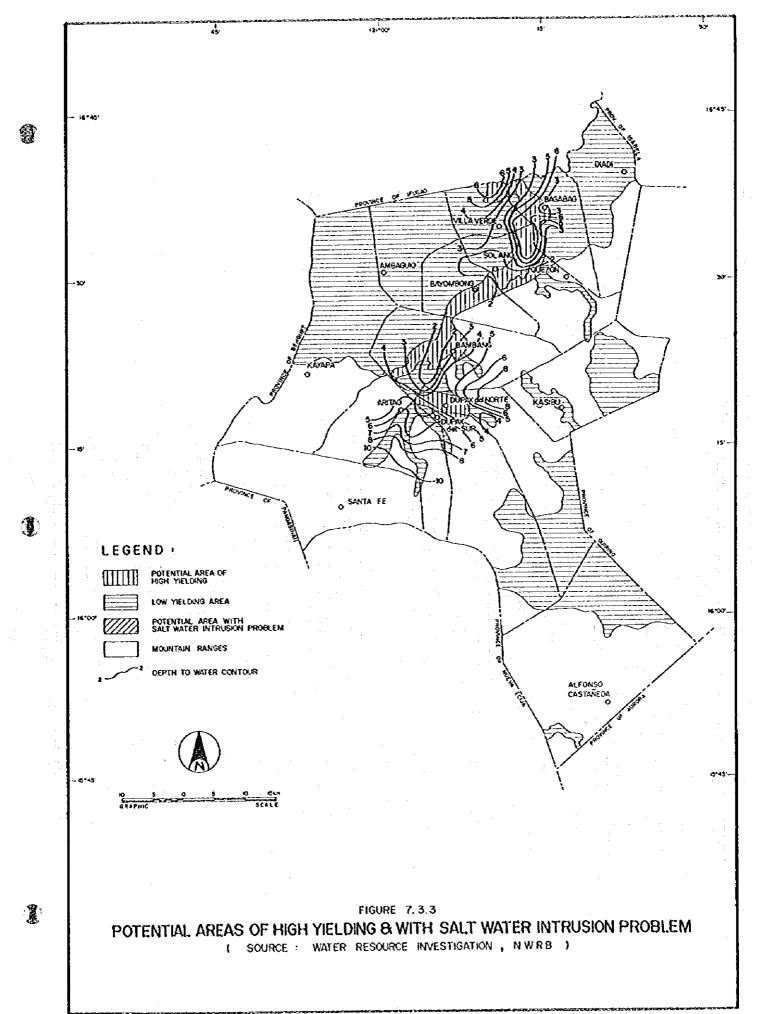
Figure 7.3.4 Area Category by Groundwater Utilization



Shallow well areas are defined on the following basis:

- (a) Predominance of serviceable shallow wells and presence of deep wells with water quality problem and/or low yielding aquifers.
- (b) Occurrence of impervious rocks beneath the Recent formation at shallow depth.
- 5) Based on the information provided by NWRBs well inventory and the data obtained through the questionnaires, well specifications for each municipality are established as shown in the map. These specifications are used as references in evaluating the groundwater availability in each locality. Individual well locations with technical information are presented in Figure 7.6.1, Data Report.

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(3) Future updating and utilization of the map

For future updating of the map, the following procedure shall be employed:

- Referring to the results of any supplementary water sources investigation by various agencies, redefine the potential area for groundwater development by applying the aforementioned procedures.
- 2) Update the provincial database using the questionnaires made for the study to make necessary revision of the delineated boundaries of groundwater categories.

7.4 Spring Sources

Table 7.4.1 Existing Spring Sources

	T i	Develope	ed Sprij	ng		l	ndevelo	ped Spr	ing	-		Untap	ed Spring	
Municipality	1	Dis	charge	(Use	c)		Die	charge	(l'sec)		[D	ischarge (V	sec)
•	Number			ang		Number	Ave.	F	lange		Number	Ave	Ra	nge
Alfonso Castañeda	12	0.05	0.04	•	0.06	1				-				
Ambaguio	31					1								
Aritao	26	0.99	0.30	-	2.00						T			
Bagabag	7					3	1.54	0.33	- 3	. 79				
Bambang	11					T								
Bayombong	17													
Diadi	20	3.25	3.00	-	3.50	12	3.46	0.50	- 10	0.00	4	3.00	3.00	3.00
Dapax del Norte	38	0.93	0.50		2.00	: 11	0.38	0.05	- 2	2.00	2	0.75	0.50	1.00
Dupax del Sur	28	0.41	0.21	-	1.00									
Kasibu	61	0.61	0.21		1.00	1	4.00							
Kayapa	86	0.97	0.30		5.00									
Quezon	17					10	2.94	0.06	- 4	1.54]			
Santa Fe	47	0.95	0.07	•	8.00	1.1.11								
Selano	10		l		:		:						L	
Villaverde	14		1		- : :	3	4.50	2.50	- 3	3.40			L	
TOTAL	425			:		40					6			

Source: PPDO PSPT

7.5 Surface Water Sources

(1) Study Rivers

Magat river is the main river draining most part of the northwestern half of Nueva Vizcaya, while Casecnan and Tubo are the prominent rivers on the southwestern half section. In addition, the Pampang river drains a small portion on the southwest. In this study, Magat river is given emphasis because majority of the municipalities are located within its basin. It has four major tributaries, namely, Matuno, Sta. Cruz, Sta Fe, and Marang. Magat and its tributary rivers can be categorized into two types based on drainage area and flow rate. The first type has narrow and relatively small drainage area (25-300km²) with lower flow rate (less than 10 cum/sec in average). The second type has an area of more than 500 km² with relatively higher flow rate (more than 50 cum/sec

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in average). This type of rivers is generally characterized by a long winding stream with numerous tributaries. Sta. Cruz, Sta. Fe and Marang rivers fall under the first type, while Magat and Matuno rivers represent the second type. Magat and Matuno rivers are considered potential sources of water supply since the densely populated municipalities in Nueva Viscaya are located within their catchment areas. These rivers were selected for further study. Fig. 7.5.1 shows the river basins in the province and Table 7.5.1 present basic information on the selected rivers.

Table 7.5.1 River Information and Related Data

River/Spring	Drainage		Flow Rate (co. m/sec)		Relevant Informa	tion in the Basin
	Area (km²)	Minimum	Average	Maximon	Major Mun. & Population 1/	Water District
Magat	1,740	14.07	54.42	34825	Solano 44,246	Provincial Waterworks System
Matuno	558	11.32	68.15	467.00	Bambang 33,663	None

^{1/ 1990} Population NSO

2) Sampling Points and Examination procedures

Water quality analysis of the Magat river was undertaken to determine the general characteristics of surface water in the province. The location of sampling points is shown in Figure 7.5.1.

Water sampling was carried out on June 29, 1995 at different points across the courses of selected rivers. The samples were sent to MWSS laboratory within 24 hours after they were taken. Flow rates were also measured at the same points of sampling. A composite sample for each rivers was prepared in proportion to the flow rates of the rivers.

The water quality analysis considered twelve (12) parameters and was performed in accordance to the Philippine Standard Method for Analysis of Air and Water.

(3) Results of Water Quality Analysis

Table 7.5.2 summarizes the results of analysis (refer to MWSS Central Laboratory Examination Results, 7.5 Data Report). Flow rates of Magat and Matuno rivers at the time of sampling were 73 and 74 m³/sec, respectively. The discharge rates are close to the recorded minimum flow of the rivers.

