

**C. SECTOR IMPLEMENTATION  
ARRANGEMENTS**

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ARRANGEMENTS**



**9. SECTOR MANAGEMENT PLAN**  
**9.4 Project Management Arrangements**

**Table 9.4.1 Format for Level I Project Data**

Form \_\_\_\_\_

PROPOSED LEVEL I PROJECT DATA	
Notice : This form shall be accomplished upon instruction on PST/PWSD	
<b>LOCATION</b>	1.1 Barangay/Sitio _____
	1.2 Municipality _____
<b>POP. DATA</b>	1.3 Province _____
	1.4 Region _____
<b>POP. DATA</b>	2.1 Total Community/Barangay Population _____
	2.2 Total Number of Households _____
<b>POP. DATA</b>	2.3 Proposed Population to be Served _____
	2.4 Proposed Number of Households to be Served _____
<b>INFORMATION ON THE WELL SITE</b>	3.1 Ownership : <input type="checkbox"/> Public <input type="checkbox"/> Private
	3.2 Description : _____ _____ _____
<b>INFORMATION ON THE WELL SITE</b>	3.3 Location: _____ _____ _____
	3.4 Donor (If Private Lot): _____ _____ _____
<b>DESCRIPTION OF EXISTING NEARBY SOURCES(S)</b> (Use separate sheets if necessary)	4.1 Type of Point Source: <input type="checkbox"/> Deep Well <input type="checkbox"/> Shallow Well <input type="checkbox"/> Spring <input type="checkbox"/> Others (dug well pond)
	4.2 Ownership : <input type="checkbox"/> Public <input type="checkbox"/> Private
<b>DESCRIPTION OF EXISTING NEARBY SOURCES(S)</b> (Use separate sheets if necessary)	4.3 For wells : Casing diameter _____ in. or _____ m. Casing depth _____ ft. or _____ m. Water level Well _____ ft. or _____ m. Well capacity/yield _____ gpm. or _____ m.
	4.4 For Springs : Capacity/yield _____ gpm. or _____ lps. Approx. elevation above or below Service Area _____ ft. or _____ m. Location <input type="checkbox"/> Inside of service area <input type="checkbox"/> Outside of service area Approximate distance from center of service area _____ km.
Prepared by : _____	
Municipal Liason Staff      Date _____	

Table 9.4.2 Format for Level II Feasibility Study

Form

<b>FEASIBILITY STUDY (Level II)</b>  Notice : This form shall be accomplished upon instruction of the PST/PWSO.		Barangay	Municipality
		Province	Region
<b>PROJECT SUMMARY</b>			
POPULATION DATA	1. Present Population	2. Design Population	3. Number of Households
			6. Number of Faucets
TECHNICAL DATA	4. Type of Source <input type="checkbox"/> Spring <input type="checkbox"/> Well <input type="checkbox"/> Surface Water	5. Type of System <input type="checkbox"/> Gravity <input type="checkbox"/> Pumped	
		7. Pump Horsepower _____ HP	8. Pumping Time _____ Hours per Day
	9. Total Average Daily Demand _____ Liters	10. Storage Tank Capacity _____ Liters	11. Pump Discharge Capacity _____ LPS
FINANCIAL DATA	12. Total System Cost P _____	13. Maximum Loan Amount P _____	14. Interest Rate _____
	15. Local Equity P _____	16. Funding Cost per Household P _____	17. Repayment Period (months) _____
	18. Type of Local Equity <input type="checkbox"/> Cash <input type="checkbox"/> Labor <input type="checkbox"/> Materials <input type="checkbox"/> Others, _____		
	19. Total Monthly Expense P _____	20. Monthly Fee Per Household P _____	
ANNEXES	<input type="checkbox"/> 1 Survey Form <input type="checkbox"/> 5 Design of Pipe Lines <input type="checkbox"/> 9A Fittings Schedule <input type="checkbox"/> 12 Financial Analysis <input type="checkbox"/> 2 Map of the Project Area <input type="checkbox"/> 6 Design of Reservoir                      (G.I Pipes) <input type="checkbox"/> 13 Availability of Local <input type="checkbox"/> 3 Design Criteria and                      and Pump <input type="checkbox"/> 9B Fittings Schedule                      Equity Basic Design Data <input type="checkbox"/> 7 Detailed Design Plan <input type="checkbox"/> 10 Bill of Materials <input type="checkbox"/> 4 Schematic Diagram of <input type="checkbox"/> 8 Pipes Schedule <input type="checkbox"/> 11 Cost Summary the System		
Prepared by :  _____ Date		Endorsed by :  _____ Date	
Municipal Liason Staff		PST/PWSO Coordinator	

Annex 1

SURVEY FORM  
Rural Water Supply Project

A. LOCATION

Barangay : \_\_\_\_\_ Province : \_\_\_\_\_  
Municipality : \_\_\_\_\_ Region Number : \_\_\_\_\_

B. GENERAL INFORMATION

1. Population \_\_\_\_\_
2. Number of households \_\_\_\_\_
3. Distance from poblacion \_\_\_\_\_ kilometers
4. Availability of electricity Yes  No
5. Distance form electric line \_\_\_\_\_ kilometers
6. Power cost per kilowatt hour P \_\_\_\_\_
7. Availability of public transportation \_\_\_\_\_
8. Main livelihood of residents  Land transport  
 Water transport  
 Farming  
 Industry  Others  
 Fishing

C. TECHNICAL INFORMATION

1. Are there reliable sources of potable water?

Yes  No

a) For Wells

Well capacity : \_\_\_\_\_ lps

Casing diameter : \_\_\_\_\_

Casing depth : \_\_\_\_\_

Water level from top of well : \_\_\_\_\_

Location :  Within service area  
 Outside \_\_\_\_\_ M. from service area

b) For Springs

Average dry season flow : \_\_\_\_\_  GPM  LPS

Relative elevation of spring

a. \_\_\_\_\_  ft.  m. above service area

b. \_\_\_\_\_  ft.  m. below service area

Location :  Within service area  
 Outside \_\_\_\_\_ m. from service area

2. Are there water supply system materials and equipment (pumps, pipes, fittings) which can be donated for this project from other source?

Yes  No

For pumps : Type : \_\_\_\_\_ Power : \_\_\_\_\_ HP

For pipes :  Galvanized Iron  PVC  
 Others, specify \_\_\_\_\_

3. Is there an existing water tank that can be used?  Yes  No

Type:  Steel  Reinforced Concrete

Capacity: \_\_\_\_\_  Gallons  Cubic Meters

Location: (Please indicate in the map of the project area)

Relative elevation with respect to service area \_\_\_\_\_  ft. \_\_\_\_\_  m.

4. Are there other sites where water tanks may be erected?  Yes  No

Location: (please indicate in the map of the project area)

Relative elevation with respect to service area \_\_\_\_\_  ft. \_\_\_\_\_  m.

5. Does the barrio have skilled personnel?  Yes  No

If yes, how many? Estimated Number

Plumbers : \_\_\_\_\_  
Masons : \_\_\_\_\_  
Carpenters : \_\_\_\_\_  
Others : \_\_\_\_\_

If no, are there competent contractors near the area?

Plumbing contractor :  Yes  No

Tank fabricator :  Yes  No

Are there suppliers of materials (pumps, pipes, fittings) in the municipality?

Yes  No

**D. FINANCIAL INFORMATION**

1. What can the barangay provide as local equity?

Cash : P \_\_\_\_\_  
 Labor : \_\_\_\_\_ man-days  
 Materials : Sand : \_\_\_\_\_ cu. m.  
 Gravel : \_\_\_\_\_ cu. m.  
 Cement : \_\_\_\_\_ bags  
 Others, specify : \_\_\_\_\_

2. Have the people been informed of the current financing policies for Level II systems, particularly the monthly fees required to repay loan & provide for O & M?

Yes  No

3. How much are the people willing to pay per household per month as a water fee?

Below P 6.00  P 10.00 - 15.00  Others   
 P 6.00 - 10.00  15.00 - 20.00  Specify : \_\_\_\_\_

4. Average income per household P \_\_\_\_\_ per month

**E. INSTITUTIONAL INFORMATION**

1. Is there an existing association who is ready, willing and able to manage the system

Yes  No

If yes, please specify. \_\_\_\_\_

2. Are people willing to join a water association to operate and manage a water supply system?

Yes  No

3. How many households are willing to be members? \_\_\_\_\_ households.

4. Name at least three (3) leaders of the community who can act as officers of the association, if required.

Name	Address
_____	_____
_____	_____
_____	_____



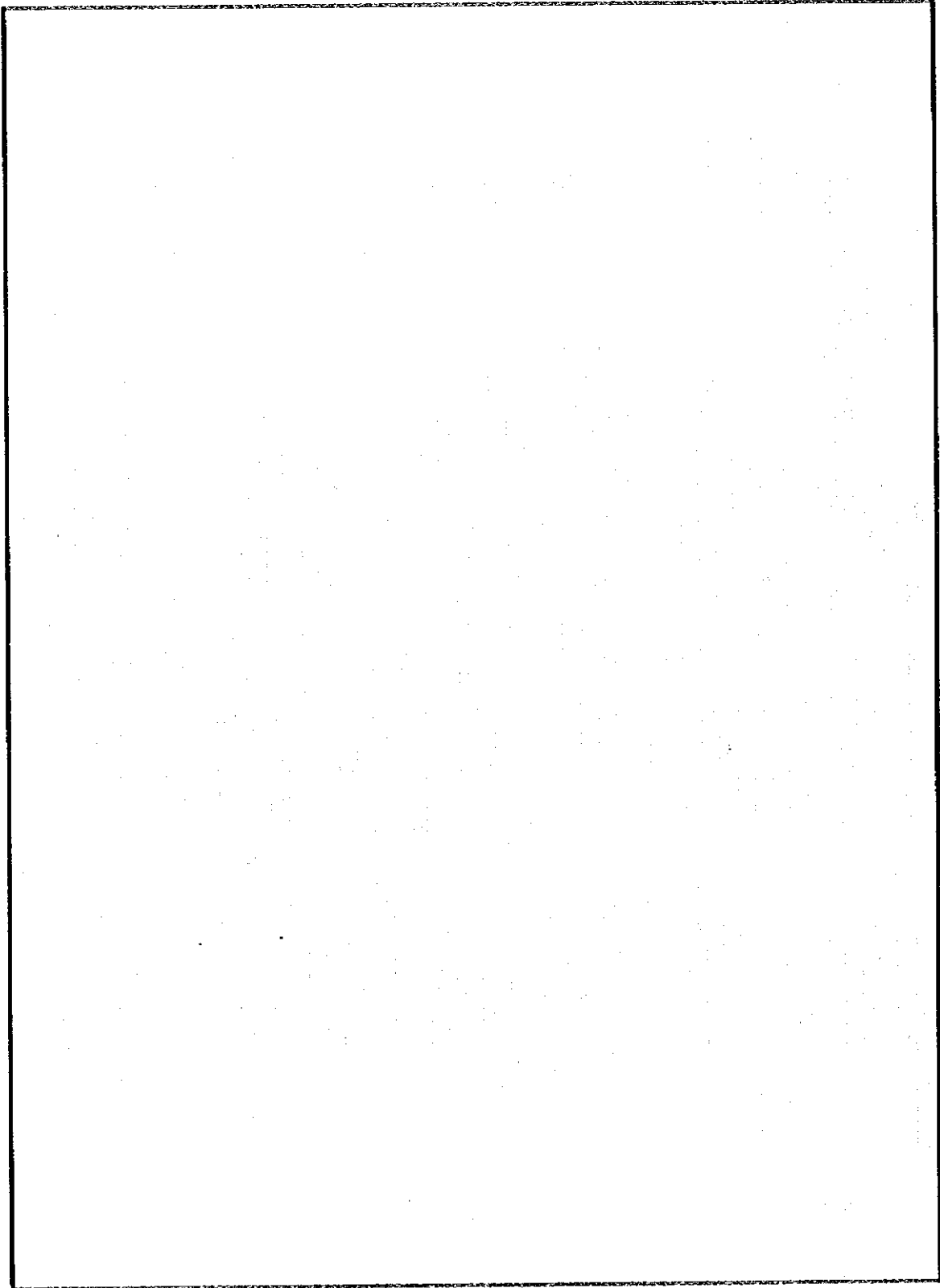
**F. MAP OF THE AREA**

Please attach map of the area proposed to be served. Indicate location of houses, buildings and other structures to be served including roads, the water source(s) and possible locations of storage tanks. The map should preferably be drawn to scale.

**Important :** If map cannot be drawn to scale, indicate distance measurements between important points along roads, or possible routes of distribution pipes with households properly indicated. For rolling terrain, indicate elevation differences between measurement points.

**G. REMARKS :**

**Annex 2**  
**MAP OF THE PROJECT AREA**  
**Rural Water Supply Project**



Annex 3

DESIGN CRITERIA AND BASIC DESIGN DATA

Rural Water Supply Project

I. Design Criteria

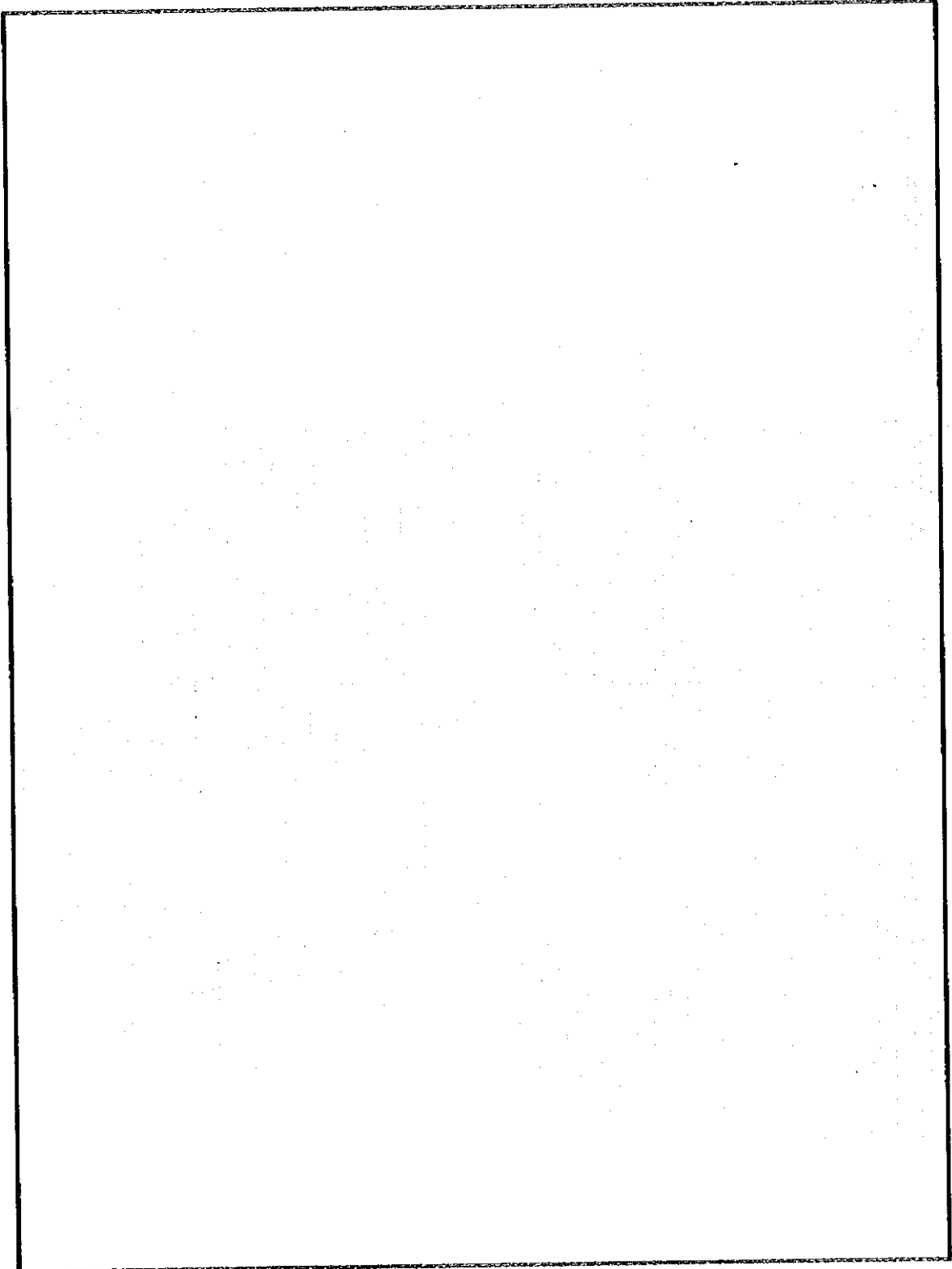
1. Design Period : 5 years
2. Population
  - Annual Growth : 3%
  - Average Household Size : 6 persons/HH
  - Design Population : Present Population x 1.16
3. Per Capita Water Consumption
  - Level II : 60 lpcd
  - Level II with garden : 75 lpcd
  - Level III : 100 lpcd
4. Water Demand
  - Average Day Demand : Design Population X Per Capita Consumption
  - Maximum Day Demand : 1.3 X Average Day Demand
  - Maximum Hour Demand : 2.5 X Average Day Demand
5. Pump Operation
  - Pumping Hours : 8 -15 hours
  - Pumping Rate : Maximum Day Demand/PumpingHrs. = \_\_\_\_\_
6. Storage Capacity : 1/4 of Average Day Demand
7. System Pressure : 5 - 10 psi at faucet
8. Households Served Per Faucet : 4 - 6 HH

II. Basic Design Data

1. Present Population : \_\_\_\_\_
2. Design Population (Present Population X 1.16) : \_\_\_\_\_
3. Average Day Demand: \_\_\_\_\_ X \_\_\_\_\_ : \_\_\_\_\_  
(Per Capita Consumption) (Design Pop.)
4. Maximum Day Demand: 1.3 X \_\_\_\_\_ : \_\_\_\_\_  
(Average Day Demand)

Annex 4

**SCHEMATIC DIAGRAM OF THE SYSTEM**  
\_\_\_\_\_ Rural Water Supply Project



Annex 5

DESIGN OF PIPELINES  
Rural Water Supply Project

SECTION (1)	NODES		SECTION LENGTH(M) (4)	HOUSEHOLD SERVED (5)	PEAKFLOW (LPS) (6)	PIPE DIA (MM) (7)	HEAD LOSS PER 100M (8)	ACTUAL HEADLOSS (9)	REMARK (10)
	From (2)	To (3)							

**Annex 6**  
**DESIGN OF RESERVOIR AND PUMP**  
 Rural Water Supply Project

**A. DESIGN**

1. Determine Capacity of Reservoir,  $(C_r)$

$$C_r = 1/4 \times \text{Average Day Demand}$$

$$C_r = 1/4 \times D_d \text{ (LPD)}$$

$$C_r = \text{_____ liters}$$

2. Determine Minimum Water Elevation,  $(WL_m)$

$$WL_m = \text{total head loss} + \text{Minimum Pressure in Main (Meters)}$$

For Barangay System, Min. Pressure = 5 psi (use 3M.)

For Poblacion System, Min. Pressure = 10 psi (use 7M.)

$$WL_m = \text{_____ M.}$$

Note: The bottom of the storage tank should be higher than this elevation.

**B. DESIGN OF PUMP**

1. Determine Pump Capacity,  $Q_p$  (LPS)

$$Q_p = \text{Max. Day Demand (LPD)} / \text{Operating Time (Sec.)}$$

$$Q_p = 78 P_d / T \quad \text{where: } P_d = \text{Design Population}$$

$T = \text{Operating Time in Seconds}$

$$Q_p = \text{_____ LPS}$$

2. Calculate Total Dynamic Head, TDH (Meters)

$$TDH = \text{Depth of Pumping Level} + \text{by Maximum Reservoir Elevation} + \text{friction loss}$$

$$TDH = \text{_____ m}$$

3. Calculate Brake Horsepower Requirement:

$$\text{Brake Horsepower} = \frac{Q_p \times TDH}{75 \times \text{Efficiency}}$$

$$\text{Brake Horsepower} = \text{_____ Hp}$$

Where:

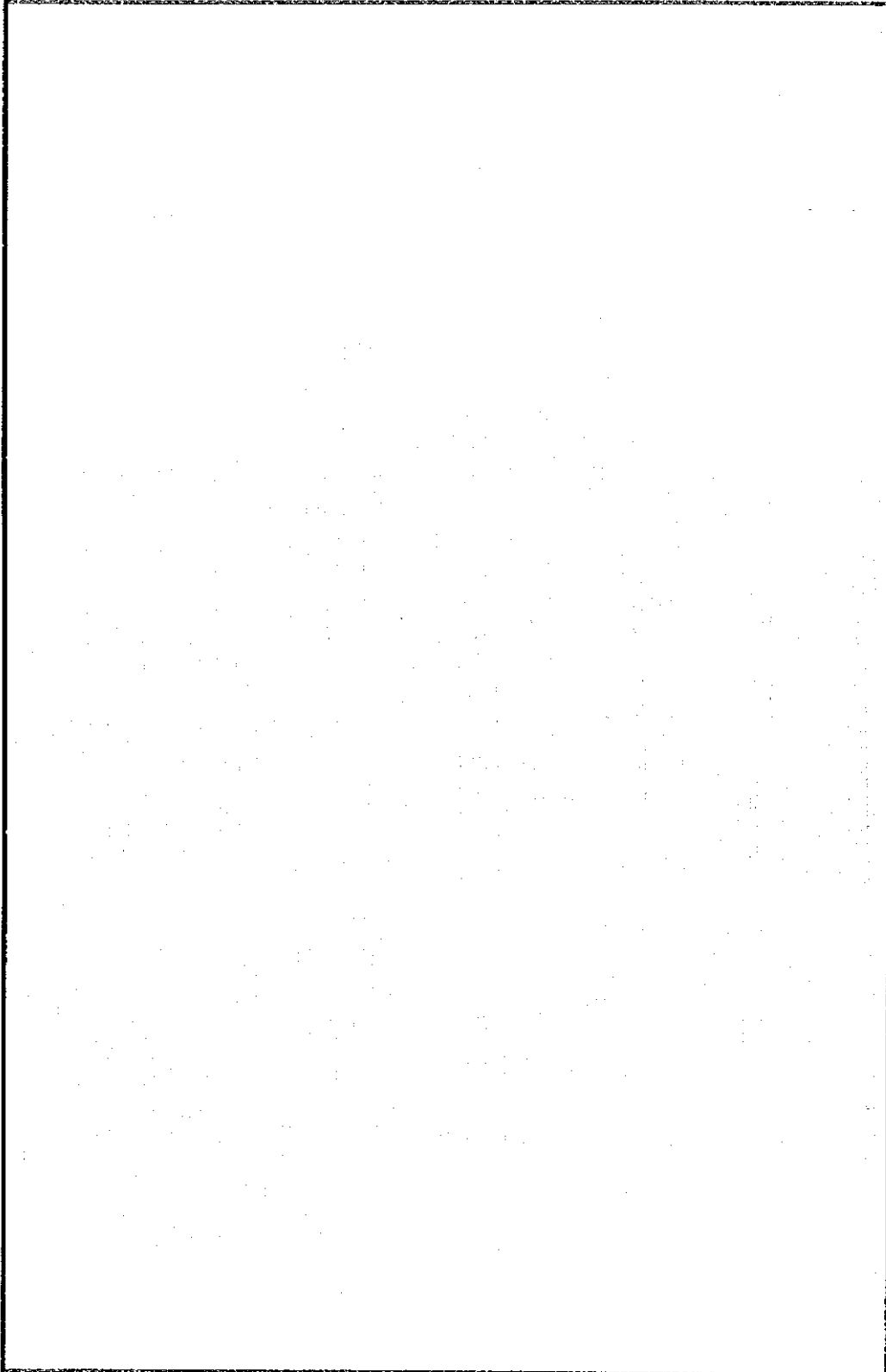
Efficiency for Centrifugal Pump, 30-60 %

Efficiency for Submersible Pump, 50-60 %

Efficiency for Jetmatic Pump, 20-30 %

**Annex 7**  
**DETAILED DESIGN PLAN**  
**Rural Water Supply Project**

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Annex 9A

### FITTINGS SCHEDULE (G.I. PIPES)

Rural Water Supply Project

NODES	COUPLING		UNION PATENTE		TEE STD.	TEE REDUCER	BUSHING REDUCER	ELBOW STD	ELBOW REDUCER	COUPLING REDUCER	FAUCET	NIPPLE	VALVES
	Qty.	Size	Qty.	Size									
SECT LENGTH													

Annex 9B

**FITTINGS SCHEDULE (PVC PIPES)**

Rural Water Supply Project

NODES	SOCKET		STD. ELBOW REDUCER	STD. TEE REDUCER	SOCKET ADAPTOR	SOCKET REDUCER	G.I FITTINGS			OTHERS
	Qty.	Size					VALVES	FAUCET	ELBOW	



**Annex 11  
COST SUMMARY**

\_\_\_\_\_ Rural Water Supply Project

**I. ESTIMATED COST OF THE SYSTEM**

- |  |   |         |
|--|---|---------|
| 1. a) Cost of Pipes                            | P |         |
| b) Cost of Fittings                            |   |         |
| Total Cost of Pipes and Fittings               |   | P _____ |
| 2. Cost of Reservoir                           |   |         |
| 3. Cost of Pump                                |   |         |
| 4. Labor Cost                                  |   |         |
| a) 10% of Pipes & Fittings (For G.I. Pipes)    |   |         |
| b) 25% of Pipes & Fittings (For PVC Pipes)     |   |         |
| 5. Cost of Freight and Handling                |   |         |
| 6. Contingencies 5% (Pipes & Fittings - Labor) |   |         |
| Total Cost of the System                       |   | P _____ |

For gravity system, omit cost of pump.

**II. FINANCIAL DATA**

- |                             |   |  |
|-----------------------------|---|--|
| 1. Total Cost of the System | P |  |
| 2. Local Equity             |   |  |
| 3. Amount of Loan           |   |  |

**Annex 12**  
**FINANCIAL ANALYSIS**

Rural Water Supply Project

**A. RELEVANT DATA**

- 1. Pumping Hours : \_\_\_\_\_ hrs.
- 2. Pump Horsepower : \_\_\_\_\_ HP
- 3. Cost/KWH : P \_\_\_\_\_
- 4. Pump Cost : P \_\_\_\_\_
- 5. Amount of Loan : P \_\_\_\_\_
- 6. Loan Terms : \_\_\_\_\_ % (interest per annum)
- : \_\_\_\_\_ years (Repayment Period)
- 7. Number of Households : \_\_\_\_\_

**B. COMPUTATION OF MONTHLY EXPENSES (Omit non-applicable items)**

- 1. Operations
  - a. Salaries \_\_\_\_\_ x \_\_\_\_\_ = P \_\_\_\_\_
  - b. Office Supplies \_\_\_\_\_ x \_\_\_\_\_ = P \_\_\_\_\_
  - c. Power \_\_\_\_\_ x \_\_\_\_\_ = P \_\_\_\_\_
  - d. Chemical \_\_\_\_\_ x \_\_\_\_\_ = P \_\_\_\_\_
  - e. Miscellaneous \_\_\_\_\_ x \_\_\_\_\_ = P \_\_\_\_\_
- 2. Asset Replacement
  - a. Pump \_\_\_\_\_ / \_\_\_\_\_ = P \_\_\_\_\_  
Life (mos.)
  - b. Pipelines \_\_\_\_\_ / \_\_\_\_\_ = P \_\_\_\_\_  
Life (mos.)
  - c. Tank \_\_\_\_\_ / \_\_\_\_\_ = P \_\_\_\_\_  
Life (mos.)
  - d. Others \_\_\_\_\_ / \_\_\_\_\_ = P \_\_\_\_\_  
Life (mos.)
- 3. Amortization \_\_\_\_\_ x \_\_\_\_\_ = P \_\_\_\_\_  
(CRF) (Loan Amt.)
- 4. Maintenance ( 2% of Capital Equipt.costs annually)  
.02 X \_\_\_\_\_ /12 = P \_\_\_\_\_
- 6. Total Monthly Expenses = P \_\_\_\_\_

**C. COMPUTATION OF WATER FEE**

Monthly Water Fee Per Household :

\_\_\_\_\_ / \_\_\_\_\_ = P \_\_\_\_\_  
(Total Monthly Expenses) (No. of HH)

**Annex 13  
AVAILABILITY OF LOCAL EQUITY**

	Item	Amount
I. Cash		P _____

II. Labor				
	Type of Labor	No. of Workers	No. of Days	Rate Per Day
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

III. Materials			
	Type of Materials	Quantity	Unit Cost
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
<b>TOTAL</b>			P _____

<p>I certify that the items listed above represent the local share of the project cost.</p> <p style="text-align: center;">_____</p> <p style="text-align: center;">Association President                      Date</p>	<p>Noted by :</p> <p style="text-align: center;">_____</p> <p style="text-align: center;">Municipal Sector Liason                      Date</p>
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## 9.5 Community Development Model

### COMMUNITY DEVELOPMENT MODEL STUDY (LEVEL I) MODEL SITE : SITIO NAGTUPACAN, PUDOC, SAN VICENTE, ILOCOS SUR

#### 1. Socio - Economic Profile of the Model Site

Sitio Nagtupacan is situated along the western coast of Barangay Pudoc, San Vicente. The terrain of the area is mostly flat and chiefly underlain by Recent alluvial and beach deposits. The area is served with electric power and there is an elementary school and a chapel.

The population in the study area is 631 and 130 households. For livelihood, most of the residents are engaged in fishing, farming and in trading business. The monthly income of the families ranges from P3,000 to P8,000.

There are two community-based organization (CBOs) active in the area -- the Fishermen/Farmers Association and the Rural Improvement Club (RIC). There is also a youth organization but it functions only during special occasions in the community.

#### 2. Present Water Supply and Sanitation Situation

The present water supply in the study area is inadequate. There is only one (1) deep well supplying the residents with drinking water. There are shallow wells but almost all have high chloride concentration and their water level goes down during dry season rendering the wells unserviceable. Other sources are dug wells near the shoreline where people draw water for washing clothes and other purposes. However, these dug wells are not reliable during rainy days

Meanwhile, only 38 out of the 180 households in the area have individual water sealed toilets. Others use the "wrap and throw" and other unsanitary methods.

#### 3. Institutional Analysis

There was no previous attempt on the part of the the residents or CBOs to develop new source/s that can augment the services of the existing well. The barangay council, however,

has recognized the need to supplement the present water service by developing additional water source/s in the area.

#### **4. Future Development Needs**

##### **4.1. Potential Source and Service Level**

An alternative source of drinking water for the area is deep well. Studies should be undertaken since saline water intrusion is highly probable. A geo-electric survey should be undertaken prior to project implementation to determine the extent of intrusion. Geo-electric investigation and water quality analysis on existing deep wells in the locality should be done.

##### **4.2 Formation of BWSA**

Since no CBOs nor non-government organizations (NGOs) have taken steps to develop Level I water facilities, the barangay council should initiate the formation of a Barangay Waterworks and Sanitation Association (BWSA) which will take the lead in implementing water and sanitation projects in the area. The immediate beneficiaries will form the core members of the association. The Municipal Sector Liaison (MSL) and the Provincial Sector Team (PST) will provide technical and institutional assistance in organizing the BWSA and in developing its capability. Once organized, the BWSA shall oversee the construction as well as the operation and maintenance of the water facilities.

#### **5. Capital and O&M Funds**

##### **5.1. Water Source Facility and Sanitary Toilet**

Capital cost required to construct a deep well facility is estimated at about P125,000. With the assistance of MSL and PST, the association can secure the needed funds from local government units or national agencies. The members shall also contribute, financially or otherwise, for the project.

Capital cost of household toilets shall be shouldered by the owners.

##### **5.2. Operation and Maintenance**

Initially, the BWSA may raise an amount equivalent to 1% of the capital cost of the water system (about P1,250), as a reserve fund for the operation and maintenance of the deep wells



as well as for all recurrent cost. Monthly contribution of P5.00 per household shall be collected to the reserve fund. Meanwhile, operation and maintenance of household toilets shall be done by the owners.

## **6. Community Involvement**

### **6.1. Pre-Construction (Project Preparation and Planning)**

- (1) The Barangay Council, in coordination with the MSL, shall initiate a meeting among the residents to discuss water and sanitation problems and the opportunities in the sector and possible implementation of water and sanitation projects in the barangay.
- (2) The residents shall organize themselves into BWSA and discuss the implementation of Level I water supply project and the provision of sanitary toilets to the residents.
- (3) The group shall determine the monthly fees that the members will contribute to cover recurrent costs, as well as to establish a reserve fund.
- (4) The BWSA shall submit a formal request to the MSL for technical and financial assistance in undertaking Level I project in the area. The request is supplemented by a commitments sheet signed by the association indicating willingness to participate in the project and their responsibility for the operation and maintenance. An initial reserve fund representing the membership fees of beneficiaries will be collected and deposited in a bank.
- (5) Upon approval of such a request, the association will mobilize its project team to assist in project implementation and in undertaking the following:
  - 1) Conduct of community study (barangay diagnostics).
  - 2) Identification of sites available where the deep wells would be installed.
  - 3) Negotiation for right of way
- (6) **Monitoring Activities:** During this stage, the association will submit a progress report to MSL indicating the status of project planning and preparation. The report will include such information as the composition and membership of the BWSA, scope of project to be implemented, project specifications, work plan and schedule, and financial arrangement.

### **6.2. Construction (Project Implementation)**

- (1) During construction of facilities, the BWSA will assign team/s which shall coordinate and monitor the implementation of the project.
- (2) Beneficiaries shall provide labor during well construction and facilities installation

- (3) The community may be asked to contribute materials which are locally available such as gravel and sand, roofing sheets, timber or tools for excavation.
- (4) The residents should provide information which may be necessary to expedite the construction of the facility.
- (5) Monitoring Activities: The BWSA will have discussions with the MSL on the status of the project.

### **6.3. Post Construction (Operation and Maintenance)**

- (1) BWSA shall arrange for proper disinfecting of the wells. It may request PHO or Rural Health Unit (RHU) to conduct periodic water quality surveillance and disinfecting wells, as required.
- (2) BWSA shall monitor whether the facilities are properly maintained or not.
- (3) Beneficiaries should be involved in the maintenance of the facilities. They shall practice to keep the premises of the water facilities clean, sanitary and free from excess water. Breakdown should be reported immediately to the BWSA and necessary repair work must be undertaken at once.
- (4) Operation and maintenance cost will be shouldered by the beneficiaries through their membership fees. The association shall regularly collect monthly contribution as reserve fund and deposit them in the bank. Expenses for repairs and improvement as well as spare parts commonly used will also be purchased out of this fund.
- (5) The members should provide labor in the repair and rehabilitation of the facilities.
- (6) Maintenance of household toilets should be the responsibility of the owners.
- (7) Monitoring Activities: The BWSA is required to submit annual report to MSL. The first report should indicate well log data, number of sanitary toilets constructed, overall cost, project modification (if any), and timetable of maintenance activities. Succeeding reports will indicate breakdowns and repairs, expenses, problems encountered in operating the facilities and, if possible, recommendations, and other relevant data.

## **7. Project Elements**

### **7.1. Health and Hygiene Education**

Health and hygiene education should be launched as early as the initial planning of the project. It would be a good entry point in discussing existing water and sanitation issues in the community prior to the formation of BWSA. The MSL should conduct a continuous health education campaign in the barangay. Special presentations can also be done by the

RHU midwife during meetings of the group. New facilities would provide opportunities to discuss hygiene practices and identify areas for improvement. Meanwhile, the school shall adopt DECS' Teacher-Child-Parent Approach which involves the family members in teaching practical lessons in hygiene education. This effort can be reinforced by multi-media campaign being organized by government institutions such as the DOH and the Philippine Information Agency.

## **7.2. Human Resources Development and Training**

The members of the BWSA will be trained on basic hand pump operation and maintenance. On-the-job training will be conducted by the MSL. Qualified members shall be enrolled at the National Manpower and Youth Council which conducts regular training course on Plumbing. Internship of graduates can be arranged with appropriate institutions. Special training shall also be conducted for women to provide them with basic skills in undertaking minor repairs.

## **7.3. Women's Involvement**

The women must be involved from the start of the project and in the operation and maintenance of the facilities. They should therefore be included in training programs conducted for the members. The women sector must likewise spearhead in health and hygiene education program of the BWSA.

**COMMUNITY DEVELOPMENT MODEL STUDY (LEVEL II)  
MODEL SITE : BARANGAY MANUEVA, SANTA, ILOCOS SUR**

**1. Socio-Economic Profile of the Model Site**

Barangay Manueva is about 3km from the town proper of Santa and covers a portion of the Abra river and a part of the Cordillera Mountain. It is traversed by the national road which is passable anytime of the year. The area has flat to undulating topography. It is composed mainly of indurated sediments and diorite igneous intrusive on the eastern section and Recent alluviums on the west.

The barangay has a population of 800 and 161 households which are clustered. Seventy percent (70%) of the work force of the barangay are engaged in weaving blankets for their livelihood. Others are into farming, small business, and office worker. The estimated family income is P12,000 to P35,000 annually. Literacy rate in the area is about 95%.

There is a plaza, a cemetery, a Catholic church and a barangay hall found in the study area. The Vigan National High School and an elementary school are situated in the adjacent barangay and are walking distance from the study area.

**2. Present Water Supply/Sanitation Situation**

The barangay residents obtain their drinking water from shallow wells, most of which are privately owned although four (4) were installed by the government for public use. For washing and other purposes, the residents get water from open dug wells. Some residents complain about the tedious way of drawing water from the dug wells. People, especially the women and children, have to walk far to fetch drinking water.

Almost 90% of the total households of the area have toilet facilities. Others dump and burn their solid wastes in vacant areas.

**3. Institutional Analysis**

The residents have been expressing discontent over the lack of sufficient water supply facilities in the barangay. The situation however had not mustered enough motivation for people to act together to improve the water supply condition in the area. Also, there are no existing NGOs active in the area that could mobilize the community to implement the project.

Lately, it has been the barangay council which has demonstrated concern in providing the residents with adequate supply of drinking water. The council has passed resolutions addressed to the municipal and provincial governments requesting for assistance in undertaking Levels I and II water supply projects to augment the present low level of service. Preliminary investigations necessary for the water supply development and implementation were already done by the PPDO.

#### **4. Future Development Needs**

##### **4.1. Potential Source and Level of Service**

Level II water system is appropriate for the area. There is an undeveloped spring at the eastern part of the barangay, about 2km from the center of the model site and about 50m above the service area. The spring is effusing from the valley sides which are mainly weathered diorite. Survey has to be conducted to determine the maximum and minimum discharge of the spring. Water quality analysis should also be periodically conducted.

Families shall be encouraged to construct individual household toilets.

##### **4.2. Formation of RWSA**

The barangay council shall initiate the formation of the Rural Waterworks and Sanitation Association (RWSA). The Municipal Sector Liaison (MSL) and the Provincial Sector Team (PST) will provide technical and institutional assistance in the formation of the RWSA and in developing its capability. Once organized, the RWSA shall oversee the water and sanitation projects to be implemented in the area.

#### **5. Capital and O&M Funds**

##### **5.1. Water Supply System**

The capital cost required to develop the Level II water system for the model site is estimated at about P800,000. The fund for the development of the spring can be sourced out from the municipal and/or provincial governments. The MSL, in coordination with the PST, shall provide guidance to BWSA in securing funds or loans for the project.

## **5.2. Household Sanitary Toilets**

Capital cost of individual household toilets (pour flush type) shall be shouldered by the homeowners. Should a family is not be able to put up the initial capital cost, the RWSA can make arrangements for the extension of loan from various institutions. Policies on interest rates and repayment scheme adopted by the institutions shall be followed.

## **5.3. Operation and Maintenance**

As mentioned earlier, the water charges to be collected by the association from the water consumers will cover costs of operation and maintenance. A reserve fund shall be set-up from membership fees collected monthly for all recurrent costs of maintaining the system.

## **6. Community Involvement**

### **6.1. Pre-Construction (Project Preparation and Planning)**

- (1) The Barangay Council, in coordination with the MSL, shall conduct meetings among the residents to discuss water and sanitation problems and needs.
- (2) The residents shall organize the RWSA to oversee the proposed project including sourcing of the funds needed in the project.
- (3) The association shall determine the scope of project and shall commit full support to such undertaking. Committees will be assigned to regularly coordinate with the municipal and provincial sector teams.
- (4) The RWSA submits a formal request to the municipal and/or provincial sector team for technical and financial assistance. The request is supplemented by a commitment sheet signed by the association indicating their willingness to participate in the project and their responsibility for the operation and maintenance. A reserve fund representing the initial contribution of beneficiaries will be deposited in a bank.
- (5) Upon approval of such request, the association will mobilize its team to assist for the following:
  - 1) preparation of a work plan including time frame and budget
  - 2) undertaking community study (barangay diagnostics)
  - 3) detailed planning as a baseline for evaluation (including technical and social aspects as well as knowledge, attitudes, practices related to water/sanitation/hygiene)
  - 4) negotiation for the acquisition of the right of way and lot donation for the sites of communal faucets

- 5) short listing of local contractor/s and conduct of bidding
- (6) RWSA shall meet with the beneficiaries to set water rates to raise funds for the system's loan repayment and cost of operation and maintenance.
- (7) Monitoring Activities: During this stage, the association will submit a progress report to the MSL indicating the status of project planning and preparation. The report will include such information as the composition and membership of RWSA, scope of project to be implemented, project specifications, work plan and schedule, and financial arrangement.

## **6.2. Construction (Project Implementation)**

- (1) The beneficiaries shall provide self-help labor to undertake the project
- (2) They shall grant right-of-way for installation of facilities
- (3) Dissemination of information on the on-going project
- (4) Provision of access to contractors
- (5) Monitoring Activities: The RWSA will coordinate with MSL on the construction activities. It shall submit a report containing information such as modifications, project team composition, people's contributions (cash, materials and labor), etc.

## **6.3. Post Construction (Facility Operations)**

- (1) The RWSA shall monitor the practices of the users to ensure proper handling of the facilities as well as prudent use of water. Every member-consumer should also cooperate with RWSA to protect the communal faucets from loss or damage.
- (2) The association shall assign person/s to regularly monitor the performance of the water source and public faucets. Water samples should be collected periodically in cooperation with Provincial Health Office (PHO) or Rural Health Unit (RHU).
- (3) The members shall pay their membership dues/water consumption charges regularly to maintain good service of the water system.
- (4) Maintenance of individual household toilets shall be the responsibility of the owners.
- (5) Monitoring Activities: The association is required to submit quarterly reports to MSL. The first post-construction report shall be submitted immediately upon the completion of the project. It should indicate scope of work (water system), overall cost, and timetable of maintenance activities. Succeeding reports will indicate breakdowns and repairs, expenses, problems encountered in operating the system and, if possible, recommendations, and other relevant data.

## **7. Project Elements**

### **7.1. Health and Hygiene Education**

To create awareness among the residents on the value of water supply and sanitation facilities, the RWSA assisted by the MSL (with the RHU) shall conduct hygiene education in the project area. The campaign should be launched as early as the commencement of the project. Hygiene education to be conducted by the RWSA could be the entry point for the improvement of water and sanitation systems in the area. Moreover, new facilities provide more opportunities to discuss hygiene practices and identify areas for improvement.

The barangay elementary school shall adopt DECS' Teacher-Child-Parent Approach learning program which involves parents and other members of the family in teaching practical lessons in hygiene education. These efforts shall be reinforced by multi-media campaign being implemented by DOH and the Philippine Information Agency.

### **7.2. Human Resources Development and Training**

Members of the RWSA will be trained on basic utility operation and maintenance. Workshops and on-the-job training will be conducted by the MSL. Qualified members will be enrolled at the National Manpower and Youth Council (NMYC) which conducts regular technical courses. Internship of graduates can be arranged with appropriate institutions.

### **7.3. Women's Involvement**

Women must be involved from the start of the project and in the operation and maintenance of the facilities. Moreover, they must spearhead in health and hygiene education.



**COMMUNITY DEVELOPMENT MODEL STUDY (LEVEL III)  
MODEL SITE: POBLACION, MAGSINGAL, ILOCOS SUR**

**1. Socio - Economic Profile of the Model Site**

The municipality of Magsingal is located 13.70km north of Vigan, the capital town of Ilocos Sur. It is bounded on the west by South China Sea and by the Cordillera Mountain on the east. The area has a relatively flat surface which generally slopes towards the west. It is underlain by Recent deposits of clay, silt sand and gravel. The municipality is mainly cultivated for rice.

The proposed model site covers the poblacion area with a population of 1,215 and 200 households. Most of the residents are engaged in farming especially those in the rural barangays. Some are into trading while others are employed in offices and factories.

**2. Present Water Supply and Sanitation Situation**

The residents obtain their drinking water from shallow wells. However, there are not enough wells to serve the entire study area. Also, most of the wells are not protected from contamination. For washing and other uses, the people utilize a spring located about 7km from the town proper.

A Level III water system was constructed in the early 60's but due to natural calamities, the system was destroyed. The old system was composed of a spring source and distribution pipelines. When the structure broke down, the municipal government was not able to rehabilitate it because of the high cost involved. Said spring still yields water being used by residents of some barangays in the eastern part of the municipality.

Health condition of the area is generally favorable as compared to other barangays in the municipality. Almost all households have their own sanitary toilets. However, there are still few cases of water-borne diseases in the area caused by improper maintenance of sanitary facilities.

**3. Institutional Analysis**

The residents have expressed willingness to participate in the development of Level III water system in the area. Moreover, they are willing to organize themselves to work on the

promotion of better health and sanitation in the area and to regularly pay for the water service.

The municipal council is also willing to provide financial assistance in the construction of the system until such time that the people would have organized and raised the necessary fund to operate and maintain the system.

There are no active non-government organizations (NGOs) that operate in the area.

#### **4. Future Development Needs**

##### **4.1. Potential Source and Service Level**

There is an untapped spring located 2km north of the town which can be a water source for the the proposed Level III system. The spring is effusing from the headwater of a tributary of a creek being tapped by the National Irrigation Administration (NIA). However, the elevation where the spring occurs is about 2m below the service area and pesticide and fertilizer contamination of the spring is highly probable. In addition, sewer intrusion is also possible, though few households are located around the spring area. The discharge of the spring is approximately 5.0 lps (wet season discharge). If this spring will be utilized, a thorough survey shall be done to determine the water quality and probable chemical content. Bacteriological examination must also be considered and a regular discharge measurement must be conducted. There could also be other springs which are likely to occur on the eastern section of the municipality and which can have continuous flow throughout the year. Discharges during dry period as well as during rainy season must both be established

Deep well is another alternative source of water for the area. Based on the geologic framework of the area, a properly designed and constructed well can easily supply 5.0 lps (discharge necessary to supply the water requirement at 16 hour-operating time). A detailed hydrogeological investigation must be carried out prior to the project implementation.

##### **4.2. Health and Sanitation**

Campaign for better maintenance of existing facilities and promotion of the construction of toilets for those who still don't have are needed.

#### **4.3. Identification of Community Organization**

As a pre-requisite to the development of the water system and sanitation facilities in the area, a community organization should be endorsed by the residents to oversee the project as well as to operate and maintain the Level III system. In the study area, there is no active organization which can assume the responsibility of implementing the project. As such, there is a need for the residents to get together and form a Rural Waterworks and Sanitation Association (RWSA). The Municipal Sector Liaison (MSL), in collaboration with the Provincial Sector Team (PST), shall provide assistance in the formation of the RWSA.

### **5. Capital and O&M Funds**

#### **5.1. Water System**

Capital cost required to construct the Level III system for the study area shall be determined after the conduct of feasibility study and detailed design. The capital cost will be sourced out by RWSA through a loan from the municipal government, the Provincial Trust Fund or from other sources. Water charges will be collected from the consumers to cover the cost of operation and maintenance, and for loan amortization.

#### **5.2. Individual Sanitary Toilets**

Capital cost of household toilets shall be shouldered by the home owners. If a family could not put up the initial capital cost, the RWSA can extend loan to the member, terms of payment of which shall be decided by the association.

### **6. Community Involvement**

#### **6.1. Pre-Construction (Project Planning and Preparation)**

(1) The MSL shall facilitate the holding of a general assembly-meeting among the residents in the service area to discuss water and sanitation problems and needs in the community. The people shall decide for themselves the action that will be taken to solve the present problems and answer their needs as far as water and sanitation are concerned.

(2) The people shall organize the RWSA to assume the management, operation and maintenance of the water supply system. Members of the RWSA shall be the main users of the water supply system. The association shall elect its officers and a manager who

will supervise the operation of the system. It shall also appoint committees which shall be responsible for all its undertakings.

- (3) The members shall pay their initial membership dues.
- (4) The association shall request the municipal/provincial government or other sector agencies to provide assistance in determining the scope of water and sanitation project they shall undertake. The MSL/PST shall present to the residents alternative schemes in developing a Level III water system for the barangay
- (5) The association submits a formal request to the municipal and/or provincial government for the necessary financial loan in undertaking the project. The request is supplemented by a commitment sheet signed by the association indicating their willingness to participate in the project, and their responsibility for the operation and maintenance. A reserve fund representing the initial contribution/membership fee of beneficiaries will be collected and deposited in a bank.
- (6) Upon approval of the loan, the association will mobilize teams for the following:
  - a) conducting feasibility study
  - b) negotiation for the acquisition of the right of way
  - c) design of the system
  - d) project bidding
  - e) project mobilization
- (7) The members shall also attend all briefings and presentations related to the project
- (8) Monitoring: During this stage, the association shall submit a progress report to the MSL indicating the status of project planning and preparation. The report will include, among others, the membership and composition of RWSA, scope of project to be implemented, project specifications, work plan and schedule, delineation of responsibilities, and financial arrangements.

## **6.2. Construction (Project Implementation)**

- (1) Since the construction of the water system will be undertaken by a qualified contractor, the direct involvement of the residents shall be limited to the following:
  - (a) Granting of right of way for pipe laying and installation of necessary facilities
  - (b) Dissemination of information on the construction activities
  - (c) Compliance with new road traffic routes
  - (d) Provision of access road for contractor/s
  - (e) Monitoring of inconveniences caused by the construction

(f) Early application for water connection

(2) **Monitoring:** The contractor will submit to the association progress reports on the status of the construction project. The report shall include any modification, problems being encountered, and possible solutions. The association shall furnish the MSL with consolidated report.

### **6.3. Post Construction (Operation and Maintenance)**

(1) The facilities shall be operated and maintained by highly-trained personnel and technicians to be assigned by the RWSA. However, the users should participate in the operation and maintenance of the systems through the following:

- 1) Paying of water bills on time
- 2) Reporting of water leaks at the main pipeline
- 3) Giving access to meter readers
- 4) Conservation of water
- 5) Campaign for more service connections
- 6) Monitoring of water quality
- 7) Attending at association meetings and other activities
- 8) Safe disposal of waste water
- 9) Dissemination of health and hygiene information

(2) Maintenance of individual household toilets shall be the responsibility of the owners.

(3) **Monitoring Activities:** The association shall submit quarterly reports to the MSL. The first post-construction report should be submitted immediately upon the completion of the project. It should indicate scope of work (water system), sanitary toilets constructed, modifications (if any), overall cost (both for water system and toilets), and timetable of maintenance activities. Succeeding reports will indicate number of connections, breakdowns and repairs, expenses, problems encountered in operating the system and, if possible, recommendations, and other relevant data.

## **7. Project Elements**

### **7.1. Health and Hygiene Education**

Health and hygiene education should be launched as early as the initial planning of the project. It would be a good entry point in discussing existing water and sanitation issues in the community prior to the formation of the association. The MSL, together with the Rural

Health Unit (RHU) should conduct a continuous health education campaign in the barangay. Special presentations can also be done by the RHU staff during meetings of the group. New facilities would provide more opportunities to discuss hygiene practices and identify areas for improvement. The primary schools in the three barangays shall adopt DECS' Teacher-Child-Parent Approach learning program which involves parents and other members of the family in teaching practical lessons in hygiene education.

These efforts can be reinforced by multi-media campaign being organized by other government institutions such as the DOH and the Philippine Information Agency.

## **7.2 Human Resources Development and Training**

Training and human resource development programs shall be directed to those who would manage, operate and maintain the water system. The officers and management staff of the RWSA shall be sent to the provincial government and other relevant central government agencies to attend basic and advanced training programs such as policy making, financial management, systems design, construction supervision, among others.

Qualified members will also be enrolled at the National Manpower and Youth Council (NMYC) which conducts water system-related courses. Internship of graduates can be arranged with the municipal/provincial government.

## **7.3 Women's Involvement**

The women must be involved from the start of the project and in the operation and maintenance of the facilities. They should therefore be included in training programs conducted for the members. The women sector must also spearhead in health and hygiene education campaign in the community.



## 10. COST ESTIMATES FOR FUTURE SECTOR DEVELOPMENT

### 10.2 Assumption for Cost Estimates

#### 10.2.1 Unit Construction Cost

Table 10.2.1 Unit Cost of Level I (Deep Well - 30m Depth)

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>A. Mobilization/Demobilization</b>		L.S.		3,300
<b>B. Drilling of Well &amp; Installation of Steel Casing/Screen</b>				
1. Materials				
(1) 100mm x 3m Steel Casing with coupling	7	pcs.	2,625	18,375
(2) 100mm x 3m Steel Casing with one end closed	1	pc.	2,719	2,719
(3) 100mm x 3m Low Carbon Steel Screen	2	pcs.	4,313	8,626
2. Labor, Fuel, Lubricant and others				
Well Drilling for 30 m depth at 200mm borehole	30	m	1,100	33,000
3. Freight Cost (9% of Materials)		L.S.		2,675
<b>Sub-Total of B</b>				65,395
<b>C. Well Development</b>		L.S.		5,000
<b>D. Gravel Packing, Installation of Handpump and Construction of Platform</b>				
1. Materials				
(1) Improved Deep Well Cylinder Pump (Malawi Type)	1	set	9,000	9,000
(2) 63mm x 6m GI Pipe with coupling	4	pcs.	1,706	6,824
(3) #10 Sieved Gravel	0.53	cu.m	870	461
(4) Coarse Sand	1	cu.m	304	228
(5) Cement for Sanitary Seal	3	bags	117	351
(6) Pump Base and Platform				
1) Cement	4	bags	117	468
2) Gravel	2	cu.m	385	770
3) Sand	1	cu.m	304	304
4) Plywood (1,200mm x 2,400mm x 6mm)	1	pc.	250	250
5) Form Lumber (50mm x 75mm x 1,800mm)	6	pcs.	45	270
6) Nail	1	kg.	32	32
<b>Sub-Total of D-1</b>				18,958
2. Labor (40% of D-1)		L.S.		7,583
3. Freight Cost (9% of Materials)		L.S.		1,706
<b>Sub-Total of D</b>				28,247
<b>E. Indirect Cost</b>				
Profit (10% of A, B, C & D)		L.S.		10,194
VAT (14% of Profit & Labor)		L.S.		7,109
<b>Sub-Total of E</b>				17,303
<b>Total of Construction Cost (A+B+C+D+E)</b>				119,245
<b>F. Estimated Government Expenses</b>				
1. Preliminary & Detailed Engineering Cost		L.S.		3,000
2. Construction Supervision		L.S.		2,000
3. Water Quality Analysis		L.S.		1,088
<b>Sub-Total of F</b>				6,088
<b>GRAND TOTAL</b>				125,333
<b>SAY</b>				125,300

Note: L.S. - Lump Sum

Source: DPWH standard price in 1994

Unit Cost: Adjusted to 1995 Price Level



Table 10.2.2 Unit Cost of Level I (Deep Well - 50m Depth)

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>A. Mobilization/Demobilization</b>		L.S.		3,300
<b>B. Drilling of Well &amp; Installation of Steel Casing/Screen</b>				
1. Materials				
(1) 100mm x 3m Steel Casing with coupling	14	pcs.	2,625	36,750
(2) 100mm x 3m Steel Casing with one end closed	1	pc.	2,719	2,719
(3) 100mm x 3m Low Carbon Steel Screen	2	pcs.	4,313	8,626
2. Labor, Fuel, Lubricant and others				
Well Drilling for 50 m depth at 200mm borehole	50	m	1,100	55,000
3. Freight Cost (9% of Materials)		L.S.		4,329
<b>Sub-Total of B</b>				<b>107,424</b>
<b>C. Well Development</b>		L.S.		5,000
<b>D. Gravel Packing, Installation of Handpump and Construction of Platform</b>				
1. Materials				
(1) Improved Deep Well Cylinder Pump (Malawi Type)	1	set	9,000	9,000
(2) 63mm x 6m GI Pipe with coupling	6	pcs.	1,706	10,236
(3) #10 Sieved Gravel	1.0	cu.m	870	870
(4) Coarse Sand	1	cu.m	304	192
(5) Cement for Sanitary Seal	3	bags	117	351
(6) Pump Base and Platform				
1) Cement	4	bags	117	468
2) Gravel	2	cu.m	385	770
3) Sand	1	cu.m	304	304
4) Plywood (1,200mm x 2,400mm x 6mm)	1	pc.	250	250
5) Form Lumber (50mm x 75mm x 1,800mm)	6	pcs.	45	270
6) Nail	1	kg.	32	32
<b>Sub-Total of D-1</b>				<b>22,743</b>
2. Labor (40% of D-1.)		L.S.		9,097
3. Freight Cost (9% of Materials)		L.S.		2,047
<b>Sub-Total of D</b>				<b>33,887</b>
<b>E. Indirect Cost</b>				
Profit (10% of A, B, C and D)		L.S.		14,961
VAT (14% of Profit & Labor)		L.S.		11,068
<b>Sub-Total of E</b>				<b>26,029</b>
<b>Total of Construction Cost (A+B+C+D+E)</b>				<b>175,640</b>
<b>F. Estimated Government Expenses</b>				
1. Preliminary & Detailed Engineering Cost		L.S.		3,000
2. Construction Supervision		L.S.		2,000
3. Water Quality Analysis		L.S.		1,088
<b>Sub-Total of F</b>				<b>6,088</b>
<b>GRAND TOTAL</b>				<b>181,728</b>
<b>SAY</b>				<b>181,700</b>

Note: L.S. - Lump Sum

Source: DPWR standard price in 1994

Unit Cost: Adjusted to 1995 Price Level

Table 10.2.3 Unit Cost of Level I (Deep Well - 70m Depth)

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>A. Mobilization/Demobilization</b>		L.S.		3,300
<b>B. Drilling of Well &amp; Installation of Steel Casing/Screen</b>				
1. Materials				
(1) 100mm x 3m Steel Casing with coupling	21	pcs.	2,625	55,125
(2) 100mm x 3m Steel Casing with one end closed	1	pc.	2,719	2,719
(3) 100mm x 3m Low Carbon Steel Screen	2	pcs.	4,313	8,626
2. Labor, Fuel, Lubricant and others				
Well Drilling for 70 m depth at 200mm borehole	70	m	1,100	77,000
3. Freight Cost (9% of Materials)		L.S.		5,982
<b>Sub-Total of B</b>				<b>149,452</b>
<b>C. Well Development</b>		L.S.		5,000
<b>D. Gravel Packing, Installation of Handpump and Construction of Platform</b>				
1. Materials				
(1) Improved Deep Well Cylinder Pump (Malawi Type)	1	set	9,000	9,000
(2) 63mm x 6m GI Pipe with coupling	9	pcs.	1,706	15,354
(3) #10 Sieved Gravel	1.5	cu.m	870	1,305
(4) Coarse Sand	1	cu.m	385	231
(5) Cement for Sanitary Seal	3	bags	117	351
(6) Pump Base and Platform				
1) Cement	4	bags	117	468
2) Gravel	2	cu.m	385	770
3) Sand	1	cu.m	304	304
4) Plywood (1,200mm x 2,400mm x 6mm)	1	pc.	250	250
5) Form Lumber (50mm x 75mm x 1,800mm)	6	pcs.	45	270
6) Nail	1	kg.	32	32
<b>Sub-Total of D-1</b>				<b>28,335</b>
2. Labor (40% of D-1.)		L.S.		11,334
3. Freight Cost (9% of Materials)		L.S.		2,550
<b>Sub-Total of D</b>				<b>42,219</b>
<b>E. Indirect Cost</b>				
Profit (10% of A, B, C and D)		L.S.		19,997
VAT (14% of Profit & Labor)		L.S.		15,160
<b>Sub-Total of E</b>				<b>35,163</b>
<b>Total of Construction Cost (A+B+C+D+E)</b>				<b>235,134</b>
<b>F. Estimated Government Expenses</b>				
1. Preliminary & Detailed Engineering Cost		L.S.		3,000
2. Construction Supervision		L.S.		2,000
3. Water Quality Analysis		L.S.		1,088
<b>Sub-Total of F</b>				<b>6,088</b>
<b>GRAND TOTAL</b>				<b>241,222</b>
<b>SAY</b>				<b>241,200</b>

Note: L.S. - Lump Sum

Source: DPWH standard price in 1994

Unit Cost: Adjusted to 1995 Price Level.

**Table 10.2.4 Unit Cost of Level I (Deep Well Rehabilitation)**

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>A. Mobilization/Demobilization</b>		L.S.		3,300
<b>B. Well Rehabilitation</b>				
<b>I. Materials</b>				
(1) Cylinder Pump Set	1	set	9,000	9,000
(2) Cement for Surface Sealing	4	bags	117	468
(3) Pump Base and Platform				
1) Cement	4	bags	117	468
2) Gravel	2	cu.m	385	770
3) Sand	1	cu.m	304	304
4) Plywood (4' x 8' x 1/4")	1	pc.	250	250
5) Form Lumber (2" x 3" x 6")	6	pcs.	45	270
6) Nail	1	kg.	32	32
Sub-Total of B-I				11,562
2. Labor (40% of B-1)		L.S.		4,625
3. Freight Cost (9% of Materials)		L.S.		1,041
Sub-Total of B				17,228
<b>C. Well Development</b>		L.S.		6,500
<b>D. Indirect Cost</b>				
Profit (10% of A, B & C)		L.S.		2,703
VAT (14% of Profit & Labor)		L.S.		1,936
Sub-Total of D				4,639
<b>Total of Construction Cost (A+B+C+D)</b>				31,667
<b>E. Estimated Government Expenses</b>				
1. Preliminary & Detailed Engineering Cost		L.S.		1,100
2. Supervision		L.S.		650
3. Water Quality Analysis		L.S.		1,088
Sub-Total of E				2,838
<b>GRAND TOTAL</b>				34,505
<b>SAY</b>				34,500

Note: L.S. - Lump Sum

Source: DPWH standard price in 1994

Unit Cost: Adjusted to 1995 Price Level.

Table 10.2.5 Unit Cost of Level I (Shallow Well - 18m Depth)

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>A. Mobilization/Demobilization</b>		L.S.		1,100
<b>B. Drilling of Well &amp; Installation of Steel Casing/Screen</b>				
1. Materials				
(1) 50mm x 6m PVC Pipe with socket	2	pcs.	813	1,626
(2) 50mm x 3m PVC Pipe with plug	1	pc.	410	410
(3) 50mm PVC Socket	1	pc.	90	90
(4) 50mm x 3m PVC Screen	1	pc.	1,300	1,300
2. Labor, Fuel, Lubricant and others				
Well Drilling for 18 m depth at 150mm borehole	18	m	520	9,360
3. Freight Cost (9% of Materials)		L.S.		308
<b>Sub-Total of B</b>				13,094
<b>C. Well Development</b>		L.S.		500
<b>D. Gravel Packing, Installation of Handpump and Construction of Platform</b>				
1. Materials				
(1) 50mm Jetmatic Handpump	1	set	2,380	2,380
(2) 50mm x 1m GI Pipe (Sch. 40)	1	pc.	75	75
(3) #10 Sieved Gravel	0.1	cu m	870	87
(4) Coarse Sand	0.07	cu m	304	21
(5) Cement for Sanitary Seal	1	bag	117	117
(6) Pump Base and Platform				
1) Cement	4	bags	117	468
2) Gravel	1	cu m	385	385
3) Sand	1	cu m	304	304
4) Plywood (1,200mm x 2,400mm x 6mm)	1	pc.	250	250
5) Form Lumber (50mm x 75mm x 1,800 mm)	1	pc.	45	45
6) Nail	1	kg.	32	32
<b>Sub-Total of D-1</b>				4,164
2. Labor (40% of D-1.)		L.S.		1,666
3. Freight Cost (9% of Materials)		L.S.		375
<b>Sub-Total of D</b>				6,205
<b>E. Indirect Cost</b>				
Profit (10% of A, B, C & D)		L.S.		2,090
VAT (14% of Profit & Labor)		L.S.		1,836
<b>Sub-Total of E</b>				3,926
<b>Total of Construction Cost (A+B+C+D+E)</b>				24,825
<b>F. Estimated Government Expenses</b>				
1. Preliminary & Detailed Engineering Cost		L.S.		2,000
2. Construction Supervision		L.S.		1,500
3. Water Quality Analysis		L.S.		1,088
<b>Sub-Total of F</b>				4,588
<b>GRAND TOTAL</b>				29,413
<b>SAY</b>				29,400

Note: L.S. - Lump Sum  
Source: DPWH standard price in 1994  
Unit Cost: Adjusted to 1995 Price Level

**Table 10.2.6 Unit Cost of Level II (600 Service Population)**

Sheet-1

(Cost. Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>A. Mobilization/Demobilization</b>		L.S.		<b>3,000</b>
<b>B. Construction of Spring Box</b>				
1. Materials		L.S.		36,300
2. Labor (30% of 1.)		L.S.		10,890
3. Freight Cost (9% of Materials)		L.S.		3,267
<b>Sub-Total of B</b>				<b>50,457</b>
<b>C. Installation of Pipelines &amp; Fittings</b>				
<b>1. Transmission Main</b>				
(1) Materials				
1) 63mm dia. PVC Pipe (Class 12.5 with pusher type socket)	330	pes.	813	268,290
2) 63mm dia. Tee	1	no.	88	88
3) Solvent Cement	26	cans	46	1,196
4) 63mm dia. x 150mm Nipple	3	nos.	136	408
5) 63mm dia. Union Patente	1	pc.	173	173
6) 63mm dia. x 50mm dia. Reducing Socket	2	pes.	105	210
7) 63mm dia. Elbow (90 deg.)	1	pc.	76	76
8) 63mm dia. Elbow (45 deg.)	1	pc.	75	75
9) 63mm dia. Gate Valve	3	pes.	763	2,289
<b>Sub-Total of Materials</b>				<b>272,805</b>
(2) Labor (30% of Material Cost)		L.S.		81,842
(3) Freight Cost (9% of Materials)		L.S.		24,552
<b>Sub-Total of Transmission Main</b>				<b>379,199</b>
<b>2. Distribution Pipeline</b>				
(1) Materials				
1) 50mm dia. PVC Pipe (Class 12.5 with pusher type socket)	20	pes.	450	9,000
2) 38mm dia. PVC Pipe (Class 12.5 with pusher type socket)	30	pes.	300	9,000
3) 20mm dia. PVC Pipe (Class 40 with pusher type socket)	10	pes.	100	1,000
4) 13mm dia. x 1 m Stand Pipe	10	pes.	94	940
5) Solvent Cement	4	cans	46	184
6) Fittings				
a. 50mm dia. x 150mm PVC Nipple	3	pes.	125	375
b. 32mm dia. x 150mm PVC Nipple	3	pes.	76	228
c. 13mm dia. x 150mm GI Nipple	40	pes.	25	1,000
d. 50mm dia. Union Patente	1	pes.	163	163
e. 32mm dia. Union Patente	2	pes.	71	142
f. 13mm dia. Union Patente	10	pes.	25	250
g. 50mm dia. x 32mm dia. Reducing Socket	6	pes.	90	540
h. 32mm dia. x 20mm dia. Reducing Socket	10	pes.	70	700
i. 20mm dia. x 13mm dia. Reducing Socket	10	pes.	55	550
j. 50mm dia. PVC Elbow (90 deg.)	2	pes.	68	136
k. 13mm dia. GI Elbow (90 deg.)	20	pes.	13	260
l. 20mm dia. x 13mm dia. Socket Adapter	10	pes.	41	410
m. 50mm dia. GI Gate Valve	2	pes.	671	1,342
n. 32mm dia. GI Gate Valve	2	pes.	380	760
o. 13mm dia. GI Gate Valve	24	pes.	230	5,520
p. 13mm dia. Brass Faucet	24	pes.	41	984
q. 50mm dia. Tee	4	pes.	130	520
r. 32mm dia. Tee	6	pes.	110	660
s. Water Meter	24	pes.	750	18,000
t. Water Meter Box	24	pes.	1,100	26,400
<b>Sub-Total of Materials</b>				<b>79,064</b>
(2) Labor (30% of Material Cost)		L.S.		23,719
(3) Freight Cost (9% of Materials)		L.S.		7,116
<b>Sub-Total of Distribution Pipeline</b>				<b>109,899</b>
<b>Sub-Total of C</b>				<b>489,098</b>

**Table 10.2.6 Unit Cost of Level II (600 Service Population)**

Sheet-2

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>D. Indirect Cost</b>				
1. Transmission Main				
(1) Profit (10% of C-1)		L.S.		37,920
(2) VAT (10% of Profit and Labor)		L.S.		11,976
2. Source Facilities and Distribution Pipeline				
(1) Profit (10% of A, B, C-2)		L.S.		16,336
(2) VAT (14% of Profit and Labor)		L.S.		7,132
<b>Sub-Total of D</b>				<b>73,364</b>
<b>Total Construction Cost (A+B+C+D)</b>				<b>615,919</b>
<b>E. Estimated Government Expenses</b>				
1. Preliminary & Detailed Engineering and RWSA Formation		L.S.		2,000
2. Supervision		L.S.		12,000
3. Water Quality Analysis		L.S.		1,088
<b>Sub-Total of E</b>				<b>15,088</b>
<b>Total Estimated Cost</b>				<b>631,007</b>
<b>Unit Cost per Person Served</b>				<b>1,052</b>
				<b>Say 1,100</b>

Note: L.S. - Lump Sum

Source: DPWH standard price in 1994

Unit Cost: Adjusted to 1995 Price Level

**Table 10.2.7 Unit Cost of Level III (5,000 Service Population)**

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>A. Mobilization/Demobilization</b>		L.S.		300,000
<b>B. Source Development and Storage</b>				
1. Deep Well	1	No.	1,540,000	1,540,000
2. Deep Well Pump	1	No.	550,000	550,000
3. Chlorinator House & Equipment	1	L.S.		440,000
4. Storage Tank (250 cu.m)	1	No.	1,100,000	1,100,000
<b>Sub-Total of B</b>				<b>3,630,000</b>
<b>C. Transmission Main</b>				
1. 160mm dia.	500	L.M.	1,120	560,000
<b>Sub-Total of C</b>				<b>560,000</b>
<b>D. Distribution Main</b>				
1. 160mm dia.	1,000	L.M.	1,120	1,120,000
2. 110mm dia.	3,000	L.M.	925	2,775,000
3. 90mm dia.	3,000	L.M.	580	1,740,000
4. 75mm dia.	5,000	L.M.	540	2,700,000
<b>Sub-Total of D</b>				<b>8,335,000</b>
<b>E. Service Connections</b>	1,000	Nos.	1,940	1,940,000
<b>F. Miscellaneous</b>				
1. Vehicle	1	No.	550,000	550,000
2. Office & Workshop Bldg	1	No.	550,000	550,000
3. Office Equipment		L.S.		100,000
4. Tools and Spare Parts		L.S.		100,000
<b>Sub-Total of F</b>				<b>1,300,000</b>
<b>Total Direct Cost (A+B+C+D+E+F)</b>				<b>16,065,000</b>
<b>G. Indirect Cost (25% of Direct Cost)</b>		L.S.		4,016,250
<b>Total Estimated Cost</b>				<b>20,081,250</b>
<b>Unit Cost per Person Served</b>				
<b>For New Construction</b>				4,016
			Say	4,000
<b>For Expansion of Existing System (Exclude F.)</b>				3,691
			Say	3,700

Note: L.S. - Lump Sum

Source: LWUA standard price in 1994

Unit Cost: Adjusted to 1995 Price Level

Table 10.2.8 Unit Cost of Level III (10,000 Service Population)

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>A. Mobilization/Demobilization</b>		L.S.		300,000
<b>B. Source Development and Storage</b>				
1. Deep Well	1	No.	1,540,000	1,540,000
2. Deep Well Pump	1	No.	550,000	550,000
3. Chlorinator House & Equipment	1	L.S.		440,000
4. Storage Tank (250 cu.m)	1	No.	1,100,000	1,100,000
<b>Sub-Total of B</b>				3,630,000
<b>C. Transmission Main</b>				
1. 160mm dia.	500	L.M.	1,120	560,000
<b>Sub-Total of C</b>				560,000
<b>D. Distribution Main</b>				
1. 160mm dia.	2,000	L.M.	1,120	2,240,000
2. 110mm dia.	5,000	L.M.	925	4,625,000
3. 90mm dia.	6,000	L.M.	580	3,480,000
4. 75mm dia.	8,000	L.M.	540	4,320,000
<b>Sub-Total of D</b>				14,665,000
<b>E. Service Connections</b>	2,000	Nos.	1,940	3,880,000
<b>F. Miscellaneous</b>				
1. Vehicle	1	No.	550,000	550,000
2. Office & Workshop Bldg.	1	No.	550,000	550,000
3. Office Equipment		L.S.		100,000
4. Tools and Spare Parts		L.S.		100,000
<b>Sub-Total of F</b>				1,300,000
<b>Total Direct Cost (A+B+C+D+E+F)</b>				24,335,000
<b>G. Indirect Cost (25% of Direct Cost)</b>		L.S.		6,083,750
<b>Total Estimated Cost</b>				30,418,750
<b>Unit Cost per Person Served For New Construction</b>				3,042
			Say	3,000
<b>For Expansion of Existing System (Exclude F.)</b>				2,879
			Say	2,900

Note: L.S. - Lump Sum

Source: LWUA standard price in 1994

Unit Cost: Adjusted to 1995 Price Level



Table 10.2.9 Unit Cost of Level III (15,000 Service Population)

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>A. Mobilization/Demobilization</b>		L.S.		300,000
<b>B. Source Development and Storage</b>				
1. Deep Well	2	No.	1,540,000	3,080,000
2. Deep Well Pump	2	No.	550,000	1,100,000
3. Chlorinator House & Equipment	2	L.S.		440,000
4. Storage Tank (250 cu.m)	2	No.	1,100,000	2,200,000
<b>Sub-Total of B</b>				<b>6,820,000</b>
<b>C. Transmission Main</b>				
1. 160mm dia.	1,000	L.M.	1,120	1,120,000
<b>Sub-Total of C</b>				<b>1,120,000</b>
<b>D. Distribution Main</b>				
1. 160mm dia.	3,000	L.M.	1,120	3,360,000
2. 110mm dia.	7,000	L.M.	925	6,475,000
3. 90mm dia.	9,000	L.M.	580	5,220,000
4. 75mm dia.	11,000	L.M.	540	5,940,000
<b>Sub-Total of D</b>				<b>20,995,000</b>
<b>E. Service Connections</b>	3,000	Nos.	1,940	5,820,000
<b>F. Miscellaneous</b>				
1. Vehicle	1	No.	550,000	550,000
2. Office & Workshop Bldg.	1	No.	550,000	550,000
3. Office Equipment		L.S.		100,000
4. Tools and Spare Parts		L.S.		100,000
<b>Sub-Total of F</b>				<b>1,300,000</b>
<b>Total Direct Cost (A+B+C+D+E+F)</b>				<b>36,355,000</b>
<b>G. Indirect Cost (25% of Direct Cost)</b>		L.S.		9,088,750
<b>Total Estimated Cost</b>				<b>45,443,750</b>
<b>Unit Cost per Person Served</b>				
For New Construction				3,030
			Say	3,000
For Expansion of Existing System (Exclude F.)				2,921
			Say	2,900

Note: L.S. - Lump Sum

Source: LWUA standard price in 1994

Unit Cost: Adjusted to 1995 Price Level

Table 10.2.10 Unit Cost of Flush Water Sealed with Septic Tank Toilet

Sheet 1

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>A. Demolition</b>		L.S.		1,000
<b>B. Earthwork</b>				
1. Materials				
(1) Gravel Fill	1	cu.m.	385	385
Sub-Total of B-1				385
2. Labor				
(1) Excavation	6	cu.m.	119	714
(2) Backfill	2	cu.m.	108	216
(3) Gravel Fill	1	cu.m.	141	141
Sub-Total of B-2				1,071
Sub-Total of B				1,456
<b>C. Walls &amp; Posts</b>				
1. Materials				
(1) 0.15 x 0.20 x 0.40 Ord. CHB	180	pcs.	6	1,080
(2) Cement	17	bags	117	1,989
(3) Sand	2	cu.m.	304	608
(4) Rebars: 12 mm dia. x 6.0 m	5	pcs.	68	340
10 mm dia. x 6.0 m	2	pcs.	49	98
(5) #16 Tie Wire	1	kg.	49	49
(6) Scaffolding: 10-2" x 4" x 8" (Ord. Lumber)	53	bf.	32	1,696
Sub-Total of C-1				5,860
2. Labor (30% of C-1)		L.S.		1,758
Sub-Total of C				7,618
<b>D. Roofing Work</b>				
1. Materials				
(1) GA #26 Corr. GI (L=3.0 m)	3	bd.ft.	274	822
(2) GA #26 Plain GI Flushing	1	pc.	264	264
(3) GA # 24 Plain GI Gutter	1	pc.	264	264
(4) Roof Nails	2	kgs.	44	88
(5) Rafter - 2" x 5 x 10', 4 pcs.	33.33	bd.ft	32	1,067
(6) Purlins - 2" x 2" x 12', 3 pcs.	12	bd.ft	32	384
(7) Wood Cleats - 2" x 2" x 12', 1 pc.	3.33	bd.ft	32	107
(8) Nailers - 2" x 2" x 12', 5 pcs.	20	bd.ft	32	640
2" x 2" x 10', 5 pcs.	20	bd.ft	32	640
(9) Fascia Board - 1" x 12" x 18', 2 pcs.	36	bd.ft	32	1,152
(10) Common Wire Nails (Assorted)	3	kgs.	29	87
(11) Downspout (PVC) 75 mm dia. x 3.0 m	2	pcs.	81	162
(12) Elbow (PVC) - 75 mm dia.	2	pcs.	15	30
(13) Coupling (PVC) - 75 mm dia.	1	pc.	14	14
Sub-Total of D-1				5,721
2. Labor (30% of D-1)		L.S.		1,716
Sub-Total of D				7,437

Table 10.2.10 Unit Cost of Flush Water Sealed with Septic Tank Toilet

Sheet 2

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>E. Plumbing</b>				
1. Materials				
(1) Water Closet	1	set	2,000	2,000
(2) Water line and sanitary fixtures with septic tank		L.S.		6,192
Sub-Total of E-1				8,192
2. Labor (30% of E-1)		L.S.		2,458
Sub-Total of E				10,650
<b>F. Carpentry Work</b>				
1. Materials				
(1) Flush Type Door w/Lower Jambs	1	pc.	1,428	1,428
(2) Windows (wooden jalousy) w/Jambs	2	sets	298	596
Sub-Total of F-1				2,024
2. Labor (30% of E-1)		L.S.		607
Sub-Total of F				2,631
<b>G. Freight Cost (9% of Materials for B-F excluding indigenous materials)</b>		L.S.		1,575
<b>H. Indirect Cost</b>				
Profit (10% of A - G)		L.S.		3,237
VAT (14% of Profit & Labor)		L.S.		1,519
Sub-Total of H				4,756
<b>Total of Construction Cost (A+B+C+D+E+F+G+H)</b>				37,123
			Say	37,100

Source: DOH standard price in 1993.

Unit Cost: Adjusted to 1995 Price Level

**Table 10.2.11 Unit Cost of Pour Flush with Double Pit Latrine**

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>A. Earthwork</b>				
1. Materials				
(1) Gravel Fill	1	cu.m.	385	385
Sub-Total of A-1				385
2. Labor				
(1) Excavation	6	cu.m.	119	714
(2) Backfill	2	cu.m.	108	216
(3) Gravel Fill	1	cu.m.	141	141
Sub-Total of A-2				1,071
Sub-Total of A				1,456
<b>B. Concrete Work</b>				
1. Materials				
Slab on wood planks				
(1) 16 - 2" x 8" x 6' Coco Lumber	128	bd.ft.	8	1,024
(2) 10mm dia x 6.0m Rebar	3	pes.	49	147
(3) #16 Tie Wire	0.5	kg.	49	25
(4) Cement	10	bags	117	1,170
(5) Sand	1.5	cu.m.	304	456
(6) Gravel	2	cu.m.	385	770
(7) Stone Lining with Mortar		L.S.	1,014	1,014
Sub-Total of B-1				4,606
2. Labor (25% of B-1)		L.S.		1,152
Sub-Total of B				5,758
<b>C. Walls &amp; Posts</b>				
1. Materials				
(1) 4 - 4" x 4" x 10' Coco Lumber	53.33	bd.ft.	8	427
(2) 6 - 2" x 3" x 10' Coco Lumber	30	bd.ft.	8	240
(3) 8 - 2" x 3" x 8' Coco Lumber	32	bd.ft.	8	256
(4) 2.0 m x 5.0 m Sawali	2	rolls	357	714
(5) Assorted Nails	6	kgs.	29	174
(6) Bamboo Clips		L.S.	119	119
Sub-Total of C-1				1,930
2. Labor (25% of C-1)		L.S.		483
Sub-Total of C				2,413
<b>D. Roofing Work</b>				
1. Materials				
Rafters				
(1) 4 - 2" x 4" x 6' Coco Lumber	16	bd.ft.	8	128
(2) Bamboo Purlins		L.S.	119	119
(3) Nipa Roofing	2	100	238	476
Sub-Total of D-1		pes./bundle		723
2. Labor (25% of D-1)		L.S.		181
Sub-Total of D				904
<b>E. Plumbing</b>				
1. Material				
(1) Toilet Bowl-Squat Type	1	pc.	547	547
(1) 75mm dia x 6.0m PVC Pipe	1	pc.	129	129
Sub-Total of E-1				676
2. Labor (25% of E-1)		L.S.		169
Sub-Total of E				845
<b>F. Freight Cost (9% of Materials for B - E excluding indigenous materials)</b>		L.S.		197
<b>G. Indirect Cost</b>				
Profit (10% of A - F)		L.S.		1,157
VAT (14% of Profit & Labor)		L.S.		590
Sub-Total of G				1,747
<b>Total Construction Cost (A+B+C+D+E+F+G)</b>				13,320
			Say	13,300

Note: L.S. - Lump Sum

Source: DOH standard price in 1993.

Unit Cost: Adjusted to 1995 Price Level

**Table 10.2.12 Unit Cost of Ventilated Improved Pit Latrine (VIP)**

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>A. Earthwork</b>				
1. Materials				
(1) Gravel Fill	0.5	cu.m	385	193
Sub-Total of A-1				193
2. Labor				
(1) Excavation	3	cu.m	119	357
(2) Backfill	1	cu.m	108	108
(3) Gravel Fill	0.5	cu.m	141	71
Sub-Total of A-2				536
Sub-Total of A				729
<b>B. Concrete Work</b>				
1. Materials				
Slab on wood planks				
(1) 8 - 2" x 8" x 6' Coco Lumber	64	bd.ft.	8	512
(2) 10mm dia x 6.0m Rebar	2	pcs.	49	98
(3) #16 Tie Wire	0.5	kg.	49	25
(4) Cement	4	bags	117	468
(5) Sand	0.5	cu.m	304	152
(6) Gravel	0.5	cu.m	385	193
(7) Stone Lining with Mortar		L.S.	1,014	1,014
Sub-total of B-1				2,462
2. Labor (25% of B-1)		L.S.		616
Sub-Total of B				3,078
<b>C. Walls &amp; Posts</b>				
1. Materials				
(1) 4 - 4" x 4" x 10' Coco Lumber	53.33	bd.ft.	8	427
(2) 6 - 2" x 3" x 10' Coco Lumber	30	bd.ft.	8	240
(3) 8 - 2" x 3" x 8' Coco Lumber	32	bd.ft.	8	256
(4) 2.0m x 5.0m Sawali	2	rolls	357	714
(5) Assorted Nails	6	kgs.	29	174
(6) Bamboo Clips		L.S.	119	119
Sub-Total of C-1				1,930
2. Labor (25% of C-1)		L.S.		483
Sub-Total of C				2,413
<b>D. Roofing Work</b>				
1. Materials				
Rafters				
(1) 4 - 2" x 4" x 6' Coco Lumber	16	bd.ft.	8	128
(2) Bamboo Purlins		L.S.	119	119
(3) Nipa Roofing	2	100	238	476
Sub-Total of D-1		pcs./bundle		723
2. Labor (25% of D-1)		L.S.		181
Sub-Total of D				904
<b>E. Plumbing</b>				
1. Materials				
(1) 50mm dia PVC Pipe	1	pc.	65	65
(2) Fly Screen		L.S.	50	50
Sub-Total of E-1				115
2. Labor (25% of E-1)		L.S.		29
Sub-Total of E				144
<b>F. Freight Cost (9% of Materials for B-E excluding sand and gravel)</b>		L.S.		79
<b>G. Indirect Cost</b>				
Profit (10% of A - F)		L.S.		735
VAT (14% of Profit & Labor)		L.S.		286
Sub-Total of G				1,021
<b>Total of Construction Cost (A+B+C+D+E+F+G)</b>				8,368
			Say	8,400

Note: L.S. - Lump Sum

Source: DOH standard price in 1993.

Unit Cost: Adjusted to 1995 Price Level

Table 10.2.13 Unit Cost of School Toilet

Sheet-1

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>A. Mobilization and Demobilization</b>		L.S.		5,300
<b>B. Earthwork</b>				
1. Materials				
(1) Gravel Fill	3.00	cu.m	385	1,155
Sub-Total of B-1				1,155
2. Labor				
(1) Excavation	15.88	cu.m	119	1,890
(2) Backfill	4.97	cu.m	108	537
(3) Gravel Fill	3.00	cu.m	141	423
Sub-Total of B-2				2,850
Sub-Total of B				4,005
<b>C. Concrete Work</b>				
1. Materials				
(1) Cement	61.00	bags	117	7,137
(2) Sand	4.00	cu.m	304	1,216
(3) Gravel	8.00	cu.m	385	3,080
(4) Rebars: 12mm dia x 6m	38.00	pcs.	68	2,584
10mm dia x 6m	57.00	pcs.	49	2,793
(5) #16 Tie Wire	8.00	kgs.	49	392
(6) Formworks:				
1/4" Plywood	6.00	pcs.	405	2,430
2"x2"x10" (Coco Lumber)	200.00	bd.ft.	8	1,600
Sub-Total of C-1				21,232
2. Labor (30% of C-1)		L.S.		6,370
Sub-Total of C				27,602
<b>D. Masonry Work</b>				
1. Materials				
(1) 6" CHB	800.00	pcs.	6	4,800
(2) 4" CHB	260.00	pcs.	5	1,300
(3) Cement	97.00	bags	117	11,349
(5) Sand	10.00	cu.m	304	3,040
(6) Rebars: 12mm dia x 6m	30.00	pcs.	68	2,040
10mm dia x 6m	11.00	pcs.	49	539
(7) #16 Tie Wire	4.00	kgs.	49	196
(8) Scaffolding:				
2"x4"x8" = 10 pcs. (Coco Lumber)	53.33	bf.	8	427
Sub-Total of D-1				23,691
2. Labor (30% of D-1)		L.S.		7,107
Sub-Total of D				30,798
<b>E. Roofing Work</b>				
1. Materials				
(1) GA #26 Corr. GI (1 = 10')	20.00	pcs.	274	5,480
(2) GA #24 Pln. GI Flashing	3.00	pcs.	264	792
(3) GA #24 Pln. GI Cutter (Pre-Fab)	9.00	pcs.	264	2,376
(4) Umbrella Nails 2 - 1/2"	12.00	kgs.	44	528
(5) Rafter - 2"x5"x18' = 5 pcs.	75.00	bf.	32	2,400
(6) Purlins - 2"x2"x12' = 18 pcs.	72.00	bf.	32	2,304
(7) WD Cleats - 2"x2"x10" = 6 pcs.	20.00	bf.	32	640

Table 10.2.13 Unit Cost of School Toilet

(Cost: Peso)

Sheet-2

Description	Quantity	Unit	Unit Cost	Cost
(8) Nailers - 2"x2"x10' = 30 pcs.	120.00	bf.	32	3,840
- 2"x2"x10' = 36 pcs.	120.00	bf.	32	3,840
(9) Fascia Board				
1"x12"x12' = 4 pcs.	48.00	bf.	32	1,536
1"x12"x18' = 2 pcs.	36.00	bf.	32	1,152
(10) Wood Plate				
2"x4"x20' = 2 pcs.	26.66	bf.	32	853
(11) 1/4" Thk. Mar. Plywood 4'x8'	14.00	pcs.	29	406
(12) C.W.N. Assorted	15.00	kgs.	29	435
(13) 3" dia x 3m Downspout (PVC)	3.00	pcs.	81	242
(14) 3" dia Elbow (PVC)	2.00	pcs.	15	30
(15) 3" dia Coupling (PVC)	1.00	pcs.	14	14
(16) Ceiling Vent				
1"x1"x8' = 4 pcs.	2.67	bf.	26	69
(17) Screen (1/8"x1/8")	1.00	yd.	81	81
Sub-Total of E-1				27,018
2. Labor (30% of E-1)		L.S.		8,105
Sub-Total of E				35,123
<b>F. Carpentry Work</b>				
1. Materials				
(1) D - 1 Hollow Core Tanguile Flush Type Door w/ Louver (.80x2.20)	2.00	sets	1,428	2,856
(2) D - 2 Hollow Core Tanguile Flush Type Door (.60x2.10)	1.00	sets	1,071	1,071
(3) D - 3 Louver Door (.60x1.40)	5.00	sets	893	4,465
(4) Door Jambs (Apitong)				
2"x6"x14" = 1 pc.	14.00	bf.	32	448
2"x6"x10" = 2 pcs.	20.00	bf.	32	640
2"x6"x10" = 1 pc.	18.00	bf.	32	576
2"x4"x12" = 5 pcs.	40.00	bf.	32	1,280
(7) Wooden Jalousie Window With 5 Blades (.40x.50)	14.00	set	298	4,172
(8) Window Jambs (Apitong)				
2"x6"x16" = 5 pcs.	80.00	bf.	32	2,560
2"x6"x14" = 1 pc.	14.00	bf.	32	448
2"x6"x10" = 1 pc.	10.00	bf.	32	320
(9) Cabinet				
3/4"x4'x8' = 1 pc. (plyboard)	1.00	pc.	774	774
Sub-Total of F-1				19,610
2. Labor (30% of F-1)		L.S.		5,883
Sub-Total of F				25,493
<b>G. Tile Work</b>				
1. Materials				
(1) 4 - 1/4"x4' - 1/4" Glazed Tiles	1,950.00	pcs.	4	7,800
(2) 0.10x0.20m Floor Tiles	900.00	pcs.	7	6,300
(3) Cement	4.00	bags	117	468
(4) White Cement	1.00	bag	629	629
Sub-Total of G-1				15,197

Table 10.2.13 Unit Cost of School Toilet

Sheet-3

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
2. Labor (30% of G-1)		L.S.		4,559
<b>Sub-Total of G</b>				19,756
<b>II. Plumbing Work</b>				
<b>I. Materials</b>				
(1) Toilet Bowl - Squat Type	3.00	sets	596	1,788
(2) Toilet Bowl-Sit Type	2.00	sets	596	1,192
(3) Lavatory	2.00	sets	845	1,690
(4) 4" dia x 3m PVC San. Pipe	4.00	pcs.	149	596
(5) 3" dia x 3m PVC San. Pipe	7.00	pcs.	84	588
(6) 1 1/2" dia x 3m PVC San. Pipe	4.00	pcs.	53	212
(7) 2" dia. x 3m PVC San. Pipe	2.00	pcs.	50	100
(8) 6" x 4" Floor Drain	5.00	pcs.	84	420
(9) 2" dia. Elbow PVC	4.00	pcs.	7	28
(10) 4" dia WYB PVC	2.00	pcs.	25	50
(11) 4" dia. x 3" dia. WYB PVC	12.00	pcs.	30	360
(12) 4" dia. x 2" dia. TEE PVC	2.00	pcs.	31	62
(13) 4" dia. TEE PVC	3.00	pcs.	31	93
(14) 1 1/2" dia. WYB PVC	1.00	pcs.	12	12
(15) 4" dia. Clean Out PVC	3.00	pcs.	35	105
(16) 3" dia. Clean Out PVC	1.00	pcs.	28	28
(17) Faucet	3.00	pcs.	50	150
(18) 3" dia. x 2" dia. WYB PVC	2.00	pcs.	25	50
(19) 1 1/2" dia. Elbow PVC	6.00	pcs.	13	78
(20) PVC Cement	1.00	can	121	121
(21) 2" dia. PVC San. Pipe x 3m	2.00	pcs.	79	158
(22) 4" dia. x 2" dia. TEE	2.00	pcs.	21	42
(23) Check Valve 1 1/2"	1.00	pcs.	182	182
(24) 4" P-Trap	5.00	pcs.	66	330
<b>Sub-Total of H-1</b>				8,435
2. Labor (30% of H-1)		L.S.		2,531
<b>Sub-Total of H</b>				10,966
<b>I. Painting</b>				
<b>1. Materials</b>				
(1) Acrylic, Semi Gloss	8.00	gals.	261	2,088
(2) Concrete Sealer	4.00	gals.	206	824
(3) Acri Color: Wood	4.00	gals.	80	320
(4) Enamel, QDE	6.00	gals.	266	1,596
(5) Wood Putty	1.00	gals.	302	302
(6) Paint Thinner	1.00	gals.	60	60
(7) Tinting Color	4.00	pint	40	160
(8) Sand Paper (Assorted)	15.00	pcs.	7	105
(9) Miscellaneous		L.S.	1,000	0
(10) Roof Paint (green, ready-mix)	2.00	gals.	281	562
<b>Sub-Total of I-1</b>				6,017
2. Labor (30% of I-1)		L.S.		1,805
<b>Sub-Total of I</b>				7,822



Table 10.2.13 Unit Cost of School Toilet

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>J. Electrical Work</b>				
1. Materials				
(1) 40 Watts Fluorescent Lamp	2.00	sets	255	510
(2) Elect. Wire TW #12	24.00	M	7	168
(3) Elect. Conduit - 1/2" dia x 10"	4.00	pcs.	78	312
(4) Entrance Cap. 1/2" dia	1.00	pc.	29	29
(5) Switch Outlet, Flush Type	2.00	pcs.	39	78
(6) Utility Box 2"x3"	2.00	pcs.	7	14
(7) Porcelain Receptacle 2" dia	2.00	pcs.	7	14
(8) Safety Switch 60A, 250V	1.00	set	490	490
(9) Electrical Tape	1.00	roll	22	22
Sub-Total of J-1				1,637
2. Labor (30% of J-1)		L.S.		491
Sub-Total of J				2,128
<b>K. Hardware</b>				
1. Materials				
(1) 3"x3" Butt Hinges (Loose Pin)	10.00	pcs.	15	150
(2) 4"x4" Butt Hinges (Loose Pin)	12.00	pcs.	18	216
(3) Door Lockset (Schlage US)	3.00	pcs.	454	1,362
(4) Barrel Bolt (4")	5.00	pcs.	40	200
(5) Cabinet Pull (4")	5.00	pcs.	7	35
(6) Water Storage Cover				
Checkered Plate 1/4" thick				
1.44x0.645 w/ L bar & flat bar	1.00	set	984	984
0.645x0.633 w/ L bar & flat bar	2.00	set	555	1,110
(7) Padlock	1.00	pcs.	378	378
Sub-Total of K-1				4,435
2. Labor (30% of K-1)		L.S.		1,331
Sub-Total of K				5,766
<b>L. Septic Tank and Sewage Basin</b>				
1. Materials				
(1) 4" CHB	180.00	pcs.	5	900
(2) Cement	18.00	bags	117	2,106
(3) Sand	1.50	cu.m	304	456
(4) Gravel	1.00	cu.m	385	385
(5) Rebars: 10mm dia x 6m	29.00	pcs.	68	1,972
(6) #16 Tire Wire	2.00	kgs.	49	98
(7) Formworks: Coco Lumber				
2"x3"x10' = 12 pcs.	60.00	bf.	8	480
1/4" plywood ord. 4'x8'	2.00	pcs.	405	810
C.W.N. (Assorted)	2.00	kgs.	29	58
Sub-Total of L-1				7,265
2. Labor (30% of L-1)		L.S.		2,180
Sub-Total of L				9,445

Table 10.2.13 Unit Cost of School Toilet

Sheet-5

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>M. Shallow Well (18 depth)</b>				
<b>a. Drilling of Well &amp; Installation of Steel Casing/Screen</b>				
1. Materials				
(1) 63mm x 6m PVC Pipe with socket	2.00	pcs.	813	1,626
(2) 63mm x 3m PVC Pipe with plug	1.00	pc.	410	410
(3) 63mm PVC Socket	1.00	pc.	90	90
(4) 63mm x 3m PVC Screen	1.00	pc.	1,300	1,300
Sub-Total of M-a-1				3,426
2. Labor, Fuel, Lubricant and others Well Drilling for 18m depth at 150mm borehole	18.00	m	520	9,360
Sub-Total of M-a				12,786
<b>b. Well Development</b>		L.S.		500
<b>c. Gravel Packing, Installation of Hand-Pump and Construction of Platform</b>				
1. Materials				
(1) 50mm Jetmatic Handpump	1.00	set	2,380	2,380
(2) 50mm x 1m GI Pipe (Sch. 40)	1.00	pc.	75	75
(3) #10 Sieved Gravel	0.10	cu.m	870	87
(4) Coarse Sand	0.07	cu.m	430	30
(5) Cement for Sanitary Seal	1.00	bag	117	117
(6) Pump Base and Platform				
1) Cement	4.00	bags	117	468
2) Gravel	1.00	cu.m	385	385
3) Sand	1.00	cu.m	304	304
4) Plywood (1,200mm x 2,400mm x 6mm)	1.00	pc.	405	405
5) Form Lumber (50mmx75mmx1,800mm)	1.00	pc.	45	45
6) Nail	1.00	kg.	29	29
Sub-Total of M-c-1				33,823
2. Labor (40% of M-c-1)		L.S.		13,529
Sub-Total of M-c				47,352
Sub-Total of M				60,638
<b>N. Freight Cost (9% of Materials for A - M excluding sand and gravel)</b>		L.S.		14,652
<b>O. Indirect Cost</b>				
Profit (10% of A - N)		L.S.		25,949
VAT (14% of Profit & Labor)		L.S.		11,577
Sub-Total of O				37,526
<b>Total of Construction Cost (A to O)</b>				297,020
<b>P. Estimated Government Expenses</b>				
1. Preliminary & Detailed Engineering Cost		L.S.		2,000
2. Construction Supervision		L.S.		1,500
Sub-Total of P				3,500
<b>GRAND TOTAL</b>				300,520
			Say	300,500

Source: DOH standard price in 1993.

Unit Cost: Adjusted to 1995 Price Level

Table 10.2.14 Unit Cost of Public Toilet

Sheet-1

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
<b>A. Mobilization and Demobilization</b> (2.4% of B - M)		L.S.		6,400
<b>B. Earthwork</b>				
1. Materials				
(1) Gravel Fill	3.00	cu.m	385	1,155
Sub-Total of B-1				1,155
2. Labor				
(1) Excavation	15.88	cu.m	119	1,890
(2) Backfill	4.97	cu.m	108	537
(3) Gravel Fill	3.00	cu.m	141	423
Sub-Total of B-2				2,850
<b>Sub-Total of B</b>				<b>4,005</b>
<b>C. Concrete Work</b>				
1. Materials				
(1) Cement	61.00	bags	117	7,137
(2) Sand	4.00	cu.m	304	1,216
(3) Gravel	8.00	cu.m	385	3,080
(4) Rebars: 12mm dia x 6m	38.00	pes.	68	2,584
10mm dia x 6m	57.00	pes.	48	2,736
(5) #16 Tie Wire	8.00	kgs.	48	384
(6) Formworks:				
1/4" Plywood	6.00	pes.	405	2,430
2"x2"x10" (Coco Lumber)	200.00	bd.ft.	8	1,600
Sub-Total of C-1				21,167
2. Labor (30% of C-1)		L.S.		6,350
<b>Sub-Total of C</b>				<b>27,517</b>
<b>D. Masonry Work</b>				
1. Materials				
(1) 6" CHB	800.00	pes.	6	4,800
(2) 4" CHB	260.00	pes.	5	1,300
(3) Cement	97.00	bags	117	11,349
(5) Sand	10.00	cu.m	304	3,040
(6) Rebars: 12mm dia x 6m	30.00	pes.	68	2,040
10mm dia x 6m	11.00	pes.	49	539
(7) #16 Tie Wire	4.00	kgs.	49	196
(8) Scaffolding:				
2"x4"x8" = 10 pcs. (Coco Lumber)	53.33	bf.	8	427
Sub-Total of D-1				23,691
2. Labor (30% of D-1)		L.S.		7,107
<b>Sub-Total of D</b>				<b>30,798</b>
<b>E. Roofing Work</b>				
1. Materials				
(1) GA #26 Corr. GI (1 = 10')	20.00	pes.	274	5,480
(2) GA #24 Pln. GI Flashing	3.00	pes.	264	792
(3) GA #24 Pln. GI Gutter (Pre-Fab)	9.00	pes.	264	2,376
(4) Umbrella Nails 2 - 1/2"	12.00	kgs.	44	528
(5) Rafter - 2"x5"x18" = 5 pcs.	75.00	bf.	32	2,400

Table 10.2.14 Unit Cost of Public Toilet

Sheet-2

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
(6) Purlins - 2"x2"x12' = 18 pcs.	72.00	bf.	32	2,304
(7) WD Cleats - 2"x2"x10" = 6 pcs.	20.00	bf.	32	640
(8) Nailers - 2"x2"x1012' = 30 pcs.	120.00	bf.	32	3,840
- 2"x2"x10' = 36 pcs.	120.00	bf.	32	3,840
(9) Fascia Board				
1"x12"x12' = 4 pcs.	48.00	bf.	32	1,536
1"x12"x18' = 2 pcs.	36.00	bf.	32	1,152
(10) Wood Plate				
2"x4"x20' = 2 pcs.	26.66	bf.	32	853
(11) 1/4" Thk. Mar. Plywood 4'x8'	14.00	pcs.	452	6,328
(12) C.W.N. Assorted	15.00	kgs.	29	435
(13) 3" dia x 3m Downspout (PVC)	3.00	pcs.	81	243
(14) 3" dia Elbow (PVC)	2.00	pcs.	15	30
(15) 3" dia Coupling (PVC)	1.00	pcs.	14	14
(16) Ceiling Vent, 1"x1"x8', 4 pcs.	2.67	bf.	26	69
(17) Screen (1/8"x1/8")	1.00	yd.	81	81
Sub-Total of E-1				32,941
2. Labor (30% of E-1)		L.S.		9,882
Sub-Total of E				42,823
<b>F. Carpentry Work</b>				
<b>1. Materials</b>				
(1) D - 1 Hollow Core Tanguile Flush Type Door w/ Louver (.80x2.20)	2.00	sets	1,428	2,856
(2) D - 2 Hollow Core Tanguile Flush Type Door (.60x2.10)	1.00	sets	1,071	1,071
(3) D - 3 Louver Door (.60x1.40)	5.00	sets	893	4,465
(4) Door Jambs (Apitong)				
2"x6"x14" = 1 pc.	14.00	bf.	32	448
2"x6"x10" = 2 pcs.	20.00	bf.	32	640
2"x6"x10" = 1 pc.	18.00	bf.	32	576
2"x4"x12" = 5 pcs.	40.00	bf.	32	1,280
(7) Wooden Jalousie Window With 5 Blades (.40x.50)	14.00	set	298	4,172
(8) Window Jambs (Apitong)				
2"x6"x16" = 5 pcs.	80.00	bf.	32	2,560
2"x6"x14" = 1 pc.	14.00	bf.	32	448
2"x6"x10" = 1 pc.	10.00	bf.	32	320
(9) Cabinet				
3/4"x4'x8' = 1 pc. (plyboard)	1.00	pc.	774	774
Sub-Total of F-1				19,610
2. Labor (30% of F-1)		L.S.		5,883
Sub-Total of F				25,493
<b>G. Tile Work</b>				
<b>1. Materials</b>				
(1) 4 - 1/4"x4 - 1/4" Glazed Tiles	1,950.00	pcs.	4	7,800
(2) 0.10x0.20m Floor Tiles	900.00	pcs.	7	6,300
(3) Cement	4.00	bags	117	468

Table 10.2.14 Unit Cost of Public Toilet

Sheet-3

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
(4) White Cement	1.00	bag	629	629
(5) Tiles Fittings		L.S.	4,790	4,790
Sub-Total of G-1				19,987
2. Labor (30% of G-1)		L.S.		5,996
Sub-Total of G				25,983
<b>II. Plumbing Work</b>				
<b>1. Materials</b>				
(1) Urinal	3.00	sets	1,063	3,189
(2) Toilet Bowl - Squat Type	6.00	sets	596	3,576
(3) 4" dia x 3m PVC San. Pipe	6.00	pcs.	149	894
(4) 3" dia x 3m PVC San. Pipe	4.00	pcs.	84	336
(5) 2" dia x 3m PVC San. Pipe	3.00	pcs.	50	150
(6) 3/4" dia x 6m G.I. Pipe Sch. 40	5.00	pcs.	244	1,220
(7) 1/2" dia x 6m G.I. Pipe Sch. 40	1.00	pcs.	179	179
(8) 4"x4" WYE PVC	1.00	pcs.	25	25
(9) 3" dia Elbow PVC	10.00	pcs.	30	300
(10) 3" dia 45 degrees Bend PVC	2.00	pcs.	25	50
(11) 2" dia Elbow PVC	6.00	pcs.	7	42
(12) 2" dia 45 degrees Bend PVC	2.00	pcs.	20	40
(13) 1/2" dia Elbow G.I.	5.00	pcs.	10	50
(14) 4" dia 3" dia WYE PVC	8.00	pcs.	40	320
(15) 3/4" dia TEE G.I.	7.00	pcs.	40	280
(16) 1/2" dia TEE G.I.	5.00	pcs.	20	100
(17) 4" dia x 2" dia TEE PVC	6.00	pcs.	40	240
(18) 4" dia Clean Out PVC	3.00	pcs.	35	105
(19) 2" dia Clean Out PVC	1.00	pcs.	25	25
(20) Faucet	10.00	pcs.	50	500
(21) 3" dia x 2" dia Elbow Reducer PVC	1.00	pcs.	28	28
(22) 3" dia x 2" dia WYE PVC	3.00	pcs.	25	75
(23) 2" dia x 2" dia WYE PVC	3.00	pcs.	15	45
(24) PVC Cement	1.00	can	121	121
(25) 4" dia x 2" dia WYE PVC	2.00	pcs.	40	80
(26) Gate Valve 3/4" dia	1.00	pcs.	121	121
(27) Gate Valve 1/2" dia	1.00	pcs.	96	96
(28) Water Meter 3/4" dia	1.00	pcs.	1,261	1,261
(29) 3/4" dia x 1/2" dia Elbow Reducer G.I.	1.00	pcs.	14	14
Sub-Total of H-1				13,462
2. Labor (30% of H-1)		L.S.		4,039
Sub-Total of H				17,501
<b>I. Painting</b>				
<b>1. Materials</b>				
(1) Acrylic, Semi Gloss	8.00	gals.	261	2,088
(2) Concrete Sealer	4.00	gals.	206	824
(3) Acri Color: Wood	4.00	gals.	80	320
(4) Enamel, QDE	6.00	gals.	266	1,596
(5) Wood Putty	1.00	gals.	302	302
(6) Paint Thinner	1.00	gals.	60	60

Table 10.2.14 Unit Cost of Public Toilet

Sheet-4

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
(7) Tinting Color	4.00	pint	40	160
(8) Sand Paper (Assorted)	15.00	pcs.	7	105
(9) Miscellaneous		L.S.	1,005	0
(10) Roof Paint (green, ready-mix)	2.00	gals.	281	562
Sub-Total of I-1				6,017
2. Labor (30% of I-1)		L.S.		1,805
Sub-Total of I				7,822
<b>J. Electrical Work</b>				
1. Materials				
(1) 40 Watts Flourescent Lamp	2.00	sets	255	510
(2) Elect. Wire TW #12	24.00	M	7	168
(3) Elect. Conduit - 1/2" dia x 10"	4.00	pcs.	78	312
(4) Entrance Cap. 1/2" dia	1.00	pc.	29	29
(5) Switch Outlet, Flush Type	2.00	pcs.	39	78
(6) Utility Box 2"x3"	2.00	pcs.	7	14
(7) Porcelain Receptacle 2" dia	2.00	pcs.	7	14
(8) Safety Switch 60A, 250V	1.00	set	490	490
(9) Electrical Tape	1.00	roll	22	22
Sub-Total of J-1				1,637
2. Labor (30% of J-1)		L.S.		491
Sub-Total of J				2,128
<b>K. Hardware</b>				
1. Materials				
(1) 3"x3" Butt Hinges (Loose Pin)	10.00	pcs.	15	150
(2) 4"x4" Butt Hinges (Loose Pin)	12.00	pcs.	18	216
(3) Door Lockset (Schlage US)	3.00	pcs.	454	1,362
(4) Barrel Bolt (4")	5.00	pcs.	40	200
(5) Cabinet Pull (4")	5.00	pcs.	7	35
(6) Water Storage Cover Checkered Plate 1/4" thick 1.44x0.633 w/L bar & flat bar	1.00	set	984	984
(7) 0.645x0.633 w/L bar & flat bar	2.00	set	555	1,110
(8) Padlock	1.00	pcs.	378	378
Sub-Total of K-1				4,435
2. Labor (30% of K-1)		L.S.		1,331
Sub-Total of K				5,766
<b>L. Septic Tank and Sewage Basin</b>				
1. Materials				
(1) 4" CHB	180.00	pcs.	5	900
(2) Cement	18.00	bags	117	2,106
(3) Sand	1.50	cu.m	304	456
(4) Gravel	1.00	cu.m	385	385
(5) Rebars: 10mm dia x 6m	29.00	pcs.	68	1,972
(6) #16 Tire Wire	2.00	kgs.	49	98

Table 10.2.14 Unit Cost of Public Toilet

Sheet-5

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
(7) Formworks: Coco Lumber 2"x3"x10' = 12 pcs.	60.00	bf.	8	480
1/4" plywood ord. 4'x8'	2.00	pcs.	405	810
C.W.N. (Assorted)	2.00	kgs.	29	58
Sub-Total of L-1				7,265
2. Labor (30% of L-1)		L.S.		2,180
Sub-Total of L				9,445
<b>M. Concrete Water Tank (Elevated)</b>				
1. Bath Work				
(1) Materials				
1) Gravel Fill	1.00	cu.m	385	385
Sub-Total of M-1 (1)				385
(2) Labor				
1) Excavation	14.70	cu.m	119	1,749
2) Backfill	13.08	cu.m	108	1,413
3) Gravel Fill	1.00	cu.m	141	141
Sub-Total of M-1 (2)				3,303
Sub-Total of M-1				3,688
2. Materials				
(1) Cement	62.00	bags	117	7,254
(2) Sand	4.50	cu.m	304	1,368
(3) Gravel	8.00	cu.m	385	3,080
(4) Rebars: 12mm dia x 6m	160.00	pcs.	49	7,840
(5) #16 Tie Wire	4.00	kgs.	49	196
(6) Formworks:				
1/4" plywood	12.00	pcs.	405	4,860
2"x3"x16' = 60 pcs.	480.00	bf.	8	3,840
(7) C.W.N. (Assorted)	5.00	kgs.	29	145
Sub-Total of M-2				39,647
3. Labor (30% of M-2)		L.S.		11,894
Sub-Total of M				55,229
<b>N. Freight Cost (9% of Materials for A - M excluding sand and gravel)</b>		L.S.		15,951
<b>O. Indirect Cost</b>				
Profit (10% of A - M)		L.S.		27,686
VAT (14% of Profit & Labor)		L.S.		12,712
Sub-Total of O				40,398
<b>Total of Construction Cost (A to O)</b>				317,259
<b>P. Estimated Government Expenses</b>				
1. Preliminary & Detailed Engineering Cost		L.S.		2,000
2. Construction Supervision		L.S.		1,500
Sub-Total of P				3,500
<b>GRAND TOTAL</b>			Say	320,759
				320,800

Source: DOH standard price in 1993.

Unit Cost: Adjusted to 1995 Price Level

## 10.2.2 Unit Cost of Equipment

Unit cost (CIF Manila) of equipment was referred to the standard cost estimates of DPWH as follows.

### (1) Medium size rotary drilling rig

Type:

Truck-mounted top head drive mud circulation type

Rated drilling capacity:

150 m depth for  $\phi$ 250 mm bore hole

Equipment composition:

One unit of truck-mounted drilling rig

Each one set of operating accessories, drilling tools, casing tools and fishing tools

One set of spare parts (equivalent to 10% of above equipment/tool cost)

Unit cost:

Peso 17,370,000 per set

### (2) Medium size percussion drilling equipment

Type:

Truck-mounted cable percussion type

Rated drilling capacity:

150 m depth for  $\phi$ 250 mm bore hole

Equipment composition:

One unit of truck-mounted drilling rig

Each one set of operating accessories, drilling tools, pipe handling tools and fishing tools

One set of spare parts (equivalent to 10% of above equipment/tool cost)

Unit cost:

Peso 10,280,000 per set

### (3) Well rehabilitation equipment

Equipment composition:

One unit of diesel engine driven air compressor (7.5 kg/sq.cm, 500 liter/min.)

One set of air hose and hose fittings



Unit cost:

Peso 138,000 per set

(4) Service truck

Type:

Diesel engine driven 4 tons truck equipped with crane

Unit cost:

Peso 1,175,000 per unit

(5) Support vehicle

Type:

Diesel engine driven pick-up truck with electric winch

Unit cost:

Peso 500,000 per unit

(6) Refuse collection truck

Type:

Closed type compactor truck with 5 cu.m of payload capacity

Unit cost:

Peso 1,380,000 per unit including spare parts

### 10.3 Cost of Required Facilities and Equipment

#### 10.3.1 Cost of Required Facilities

Table 10.3.1 Construction Cost of Water Supply Facilities Required for Phase I (2000)

Unit: 1,000 Pesos

Municipalities	Urban Water Supply Level III	Rural Water Supply							Level I Rehabilitation	Total	Grand Total
		New System						Sub-Total			
		Level II	Level I			Shallow Wells					
			Deep Well								
30 m	50 m	70 m									
Atilem	1,452	0	2,981	0	0	0	2,981	79	3,060	4,512	
Banayoyo	200	0	477	0	0	0	477	13	490	690	
Bantay	7,067	0	0	6,499	0	0	6,499	117	6,616	13,683	
Burgos	1,776	520	2,504	0	0	0	2,504	67	3,091	4,867	
Cabugao	0	0	0	1,581	0	0	1,581	29	1,610	1,610	
Candon	7,760	0	15,979	0	0	0	15,979	424	16,403	24,163	
Caoayan	4,414	0	0	6,499	0	0	6,499	117	6,616	11,030	
Cervantes	1,928	0	2,027	0	0	0	2,027	54	2,081	4,009	
Galinuyod	48	0	119	0	0	0	119	3	122	170	
G. del Pilar	0	0	0	0	0	0	0	0	0	0	
Lidlidda	0	0	0	0	0	0	0	0	0	0	
Magsingal	2,152	530	0	4,567	0	0	4,567	82	5,179	7,331	
Nagbukel	756	520	477	0	0	0	477	13	1,010	1,766	
Narvacan	2,287	0	19,556	0	0	0	19,556	519	20,075	22,362	
Quirino	888	1,590	2,385	0	0	0	2,385	63	4,038	4,926	
Salcedo	692	0	1,789	0	0	0	1,789	48	1,837	2,529	
San Emilio	0	0	238	0	0	0	238	6	244	244	
San Esteban	412	0	2,385	0	0	0	2,385	63	2,448	2,860	
San Helderfonso	476	0	0	1,229	0	0	1,229	22	1,251	1,727	
San Juan	1,300	0	0	4,391	0	0	4,391	79	4,470	5,770	
San Vicente	40	0	0	4,918	0	0	4,918	89	5,007	5,047	
Santa	722	520	0	5,094	0	0	5,094	92	5,706	6,428	
Santa Catalina	704	0	0	3,337	0	0	3,337	60	3,397	4,101	
Santa Cruz	3,744	0	7,870	0	0	0	7,870	209	8,079	11,823	
Santa Lucia	784	0	6,201	0	0	0	6,201	165	6,366	7,150	
Santa Maria	5,320	0	12,044	0	0	0	12,044	320	12,364	17,684	
Santiago	1,384	0	3,458	0	0	0	3,458	92	3,550	4,934	
Santo Domingo	1,058	0	0	2,635	0	0	2,635	48	2,683	3,741	
Sigay	0	0	0	0	0	0	0	0	0	0	
Sinait	0	0	0	5,620	0	0	5,620	101	5,721	5,721	
Sugpon	0	0	596	0	0	0	596	16	612	612	
Suyo	1,340	0	2,027	0	0	0	2,027	54	2,081	3,421	
Tagudin	107	0	4,531	0	0	0	4,531	120	4,651	4,758	
Vigan (Capital)	18,856	0	0	0	0	0	0	0	0	18,856	
<b>Provincial Total</b>	<b>67,667</b>	<b>3,680</b>	<b>87,644</b>	<b>46,370</b>	<b>0</b>	<b>0</b>	<b>134,014</b>	<b>3,164</b>	<b>140,858</b>	<b>208,525</b>	

**Table 10.3.2 Construction Cost of Water Supply Facilities Required for Phase II (2010)**

Unit: 1,000 Pesos

Municipalities	Urban Water Supply Level III	Rural Water Supply (Level I)						Grand Total	
		New System					Level I Rehabilitation		Total
		Deep Well			Shallow Wells	Sub-total			
		30 m	50 m	70 m					
Ablen	4,451	1,312	0	0	0	1,312	35	1,347	5,798
Banayoyo	3,171	1,669	0	0	0	1,669	44	1,713	4,884
Bantay	23,635	0	8,255	0	0	8,255	149	8,404	32,039
Burgos	4,492	2,862	0	0	0	2,862	76	2,938	7,430
Cabugao	22,980	0	10,363	0	0	10,363	187	10,550	33,530
Candon	17,647	12,640	0	0	0	12,640	336	12,976	30,623
Caoayan	16,562	0	4,742	0	0	4,742	86	4,828	21,390
Cervantes	8,932	3,577	0	0	0	3,577	95	3,672	12,604
Galimuyod	1,724	2,623	0	0	0	2,623	70	2,693	4,417
G. del Pilar	274	835	0	0	0	835	22	857	1,131
Lidlidda	5,121	835	0	0	0	835	22	857	5,978
Magsingal	15,431	0	8,782	0	0	8,782	158	8,940	24,371
Nagbukel	2,305	1,073	0	0	0	1,073	29	1,102	3,407
Narvacan	6,046	11,448	0	0	0	11,448	304	11,752	17,798
Quirino	4,851	1,908	0	0	0	1,908	51	1,959	6,810
Salcedo	4,880	2,862	0	0	0	2,862	76	2,938	7,818
San Emilio	9,457	1,312	0	0	0	1,312	35	1,347	10,804
San Esteban	2,705	2,027	0	0	0	2,027	54	2,081	4,786
San Hildelfonso	3,763	0	1,932	0	0	1,932	35	1,967	5,730
San Juan	12,758	0	8,958	0	0	8,958	162	9,120	21,878
San Vicente	4,862	0	4,742	0	0	4,742	86	4,828	9,690
Santa	3,596	0	5,445	0	0	5,445	98	5,543	9,139
Santa Catalina	4,447	0	4,918	0	0	4,918	89	5,007	9,454
Santa Cruz	14,859	8,586	0	0	0	8,586	228	8,814	23,673
Santa Lucia	5,076	6,081	0	0	0	6,081	162	6,243	11,319
Santa Maria	10,046	6,916	0	0	0	6,916	184	7,100	17,146
Santiago	7,174	4,174	0	0	0	4,174	111	4,285	11,459
Santo Domingo	10,974	0	9,133	0	0	9,133	165	9,298	20,272
Sigay	0	358	0	0	0	358	10	368	368
Sinait	8,192	0	10,538	0	0	10,538	190	10,728	18,920
Sugpon	4,007	596	0	0	0	596	16	612	4,619
Suyo	6,112	2,266	0	0	0	2,266	60	2,326	8,438
Tagudin	9,983	8,347	0	0	0	8,347	222	8,569	18,552
Vigan (Capital)	96,155	0	0	0	0	0	0	0	96,155
<b>Provincial Total</b>	<b>356,668</b>	<b>84,307</b>	<b>77,808</b>	<b>0</b>	<b>0</b>	<b>162,115</b>	<b>3,617</b>	<b>165,762</b>	<b>522,430</b>

Table 10.3.3 Costs of Sanitation Facilities Required for Phase I (2000)

Unit: 1,000 Pesos

Municipality	Urban Sanitation										Rural Sanitation						Total Public Investment Cost	Total Construction Cost	Total Public Investment Cost	
	Household Toilets					Public School Toilets	Public Toilets	Total Construction Cost	Total Public Investment Cost	Household Toilets					Public School Toilets	Total Construction Cost				Total Public Investment Cost
	Flush	Pour Flush	VIP Latrine	Sub-total of Construction Cost	Sub-total of Public Investment Cost					Flush	Pour Flush	VIP Latrine	Sub-total of Construction Cost	Sub-total of Public Investment Cost						
Ateneo	1,707	718	0	2,425	30	0	0	2,425	30	0	0	4,203	0	173	0	4,203	173			
Barangay	371	0	67	438	0	0	0	438	0	0	0	186	176	8	0	362	8			
Banay	0	0	0	0	0	0	0	0	0	0	0	6,010	4,722	244	0	10,976	194			
Burgos	2,003	1,091	0	3,094	45	0	0	3,094	45	0	0	2,540	92	104	0	2,632	104			
Cabugao	0	0	336	336	0	0	0	336	0	0	0	11,575	0	0	0	11,575	303			
Candon	7,531	0	319	7,850	0	773	0	8,623	773	0	0	80	1,053	3	4,285	5,423	4,288			
Caoyao	3,636	1,729	0	5,365	71	0	0	5,365	71	0	0	7,435	798	306	0	11,498	306			
Cervantes	0	0	0	0	0	0	635	635	0	0	0	11,771	0	484	1,084	12,855	1,568			
Galimuyod	74	133	0	207	5	0	0	207	5	0	0	931	0	38	756	1,201	756			
G. del Pilar	0	0	0	0	0	0	0	0	0	0	0	1,929	0	0	2,860	2,860	38			
Lidhida	0	93	8	101	4	0	0	101	4	0	0	80	50	3	0	130	3			
Maguapal	371	186	0	557	8	0	0	557	8	0	0	7,275	0	299	773	8,048	1,072			
Nagbuntel	928	0	59	987	0	0	0	987	0	0	0	3,418	67	141	0	3,485	141			
Narvacan	668	0	227	895	0	0	0	895	0	0	0	7,528	2,848	310	390	10,766	700			
Quinno	1,558	0	0	1,558	0	0	0	1,558	0	0	0	5,786	0	238	0	5,786	238			
Salcedo	1,113	0	59	1,172	0	0	0	1,172	0	0	0	0	0	0	302	302	302			
San Emilio	0	1,317	0	1,317	54	358	0	1,675	412	0	0	5,466	319	225	638	6,423	863			
San Esteban	371	0	59	430	0	0	0	430	0	0	0	2,075	512	2,587	85	2,587	85			
San Ildefonso	0	146	84	230	6	0	0	230	6	0	0	146	311	457	0	2,587	457			
San Juan	1,595	0	0	1,595	0	0	0	1,595	0	0	0	7,368	1,520	888	0	8,888	303			
San Vicente	0	0	8	8	0	0	0	8	0	0	0	7,209	0	297	609	7,818	906			
Santa	1,632	0	0	1,632	0	0	0	1,632	0	0	0	1,636	924	67	0	3,042	67			
Santa Catalina	482	0	101	583	0	0	0	583	0	0	0	781	0	727	0	1,508	727			
Santa Cruz	6,047	0	0	6,047	0	361	0	6,408	361	0	0	5,081	0	209	2,240	7,321	2,449			
Santa Lucia	1,707	944	0	2,651	39	367	0	3,018	406	0	0	2,597	7,900	10,497	3,267	13,764	3,592			
Santa Maria	4,044	0	92	4,136	0	0	0	4,136	0	0	0	594	1,104	2,983	45	2,983	45			
Santiago	3,079	0	84	3,163	0	0	0	3,163	0	0	0	1,569	1,329	65	0	1,294	1,294			
Santo Domingo	1,744	0	244	1,988	0	0	0	1,988	0	0	0	971	151	40	0	3,098	65			
Sigay	0	0	0	0	0	0	0	0	0	0	0	9,922	0	408	0	9,922	408			
Sinait	2,894	0	176	3,070	0	0	0	3,070	0	0	0	2,487	0	102	0	2,487	102			
Suopon	0	1,303	0	1,303	64	0	0	1,303	34	0	0	7,288	0	300	573	7,861	873			
Suyo	1,966	479	0	2,445	20	0	0	2,445	20	0	0	5,919	0	15,802	243	17,016	1,657			
Tagudin	1,076	998	0	2,074	41	0	0	2,074	41	0	0	9,683	5,919	0	0	15,602	243			
Vigan (Capital)	20,331	2,768	0	23,099	114	0	0	23,414	431	0	0	13,110	0	0	0	18,655	189,996			
Provincial Total	66,928	11,903	1,923	80,754	491	1,859	1,586	84,199	3,936	36,135	122,096	171,341	5,021	18,655	189,996	23,676				

Table 10.3.4 Costs of Sanitation Facilities Required for Phase II (2010)

Unit: 1,000 Pesos

Municipality	Urban Sanitation										Rural Sanitation						Total Public Investment Cost	Total Construction Cost	Total Public Toilets	Total Investment Cost		
	Household Toilets					Public School Toilets	Public Toilets	Total Construction Cost	Total Public Investment Cost	Urban Sewerage	Household Toilets				Public School Toilets	Total Construction Cost					Sub-total of Public Investment Cost	
	Flush	Pour Flush	VIP Latrine	Sub-total of Construction Cost	Sub-total of Public Investment Cost						Flush	Pour Flush	VIP Latrine	Sub-total of Construction Cost								Sub-total of Public Investment Cost
Ablam	5,305	0	0	5,305	0	0	0	5,305	0	6,015	0	6,224	0	6,224	256	0	6,224	256				
Banayoyo	3,838	0	0	3,838	0	0	0	3,838	0	3,489	0	7,980	0	7,980	328	311	8,291	639				
Bantay	31,127	4,495	0	35,622	185	706	0	36,328	891	43,070	22,483	16,559	0	39,042	681	1,967	41,009	2,648				
Burgos	5,528	0	0	5,528	0	0	0	5,528	0	6,473	0	11,212	0	11,212	461	478	11,690	939				
Cabugao	33,093	0	0	33,093	0	352	0	34,080	987	33,711	3,896	27,770	0	31,666	1,142	1,333	32,999	2,475				
Candon	26,935	0	0	26,935	0	418	0	27,988	1,053	30,835	0	52,881	0	52,881	2,175	2,733	55,614	4,908				
Canoyan	24,921	0	0	24,921	0	0	0	24,921	317	28,945	8,756	17,534	0	17,534	361	0	17,534	361				
Cervantes	6,752	2,088	0	8,840	86	0	0	8,940	86	11,125	0	15,827	0	15,827	651	518	16,345	1,169				
Galimuyod	2,152	0	0	2,152	0	0	0	2,152	0	1,840	0	11,318	0	11,318	466	403	11,721	869				
G. del Pilar	2,003	106	0	2,109	4	0	0	2,144	610	2,592	4,155	2,713	0	6,868	112	0	6,868	112				
Luditeda	6,418	0	0	6,418	0	0	0	6,418	635	5,322	0	3,618	0	3,618	149	0	3,618	149				
Magsangal	23,076	0	0	23,076	0	0	0	23,076	317	22,513	0	24,725	0	24,725	1,017	968	25,693	1,985				
Nagbucel	2,708	0	0	2,708	0	0	0	2,708	317	3,124	0	4,110	0	4,110	169	0	4,110	169				
Narvacan	10,499	0	0	10,499	0	0	0	10,499	317	12,016	0	42,733	0	42,733	1,758	1,350	44,083	3,108				
Quirino	5,528	0	0	5,528	0	0	0	5,528	317	5,891	0	7,980	0	7,980	328	485	8,465	813				
Salcedo	5,639	0	0	5,639	0	0	0	5,639	317	5,738	0	10,627	0	10,627	437	309	10,936	746				
San Emilio	11,872	0	0	11,872	0	0	0	11,872	317	9,826	0	5,599	0	5,599	230	0	5,599	230				
San Esteban	3,154	0	0	3,154	0	0	0	3,154	317	3,205	0	6,810	0	6,810	280	309	7,119	589				
San Ildefonso	4,378	0	0	4,378	0	0	0	4,378	0	4,365	0	5,520	0	5,520	227	455	5,975	682				
San Juan	14,988	0	0	14,988	0	0	0	14,988	0	14,498	0	22,783	0	22,783	937	729	23,512	1,666				
San Vicente	5,380	0	0	5,380	0	0	0	5,380	0	5,088	0	11,358	0	11,358	467	1,282	12,640	1,749				
Santa	6,233	0	0	6,233	0	0	0	6,233	0	7,388	223	14,564	0	14,787	599	459	15,246	1,058				
Santa Catalina	5,157	0	0	5,157	0	0	0	5,157	0	5,300	0	15,561	0	15,561	640	503	16,064	1,143				
Santa Cruz	16,510	0	0	16,510	0	307	0	17,134	624	19,031	0	37,785	0	37,785	1,554	1,901	39,686	3,455				
Santa Lucia	8,422	0	0	8,422	0	0	0	8,422	0	9,621	1,632	27,611	0	29,243	1,136	1,430	30,673	2,566				
Santa Maria	13,393	0	0	13,393	0	0	0	13,393	317	15,542	557	27,265	0	27,822	1,121	1,065	28,887	2,185				
Santiago	9,015	27	0	9,042	1	0	0	9,042	1	10,176	0	24,512	0	24,512	1,008	987	25,499	1,995				
Santo Domingo	12,911	0	0	12,911	0	0	0	12,911	317	13,228	0	25,682	0	25,682	1,056	941	26,623	1,997				
Sugay	0	0	0	0	0	0	0	0	317	317	0	3,192	0	3,192	131	0	3,192	131				
Sinait	10,685	0	0	10,685	0	0	0	10,685	317	11,002	0	21,905	0	21,905	901	678	22,583	1,579				
Suzpon	5,009	0	0	5,009	0	0	0	5,009	635	4,161	0	2,633	0	2,633	106	0	2,633	106				
Suyo	7,049	200	0	7,249	8	0	0	7,384	643	7,636	0	9,310	0	9,310	383	0	9,310	383				
Tagudin	18,513	200	0	18,713	8	0	0	19,348	643	20,696	6,789	38,025	0	44,814	1,564	782	45,596	2,346				
Vigan (Capital)	155,523	0	0	155,523	0	694	0	156,217	694	176,580	0	555,170	0	555,170	22,833	0	578,003	45,209				
<b>Provincial Total</b>	<b>503,744</b>	<b>7,116</b>	<b>0</b>	<b>510,860</b>	<b>292</b>	<b>2,477</b>	<b>0</b>	<b>522,538</b>	<b>11,970</b>	<b>560,635</b>	<b>48,491</b>	<b>603,661</b>	<b>0</b>	<b>603,661</b>	<b>22,833</b>	<b>22,376</b>	<b>626,037</b>	<b>45,209</b>				

## 10.4 Costs of Sector Management

### 10.4.1 Breakdown of Community Development and Training Cost

Cost of community development and training was estimated at 12% of the total construction cost of Level I & II water supply facilities and public toilets and at 3% of the total construction cost of Level III water supply systems. This was formulated based on the following:

- (1) The 12% was derived on the basis of DILG's past experience in BWSA formation; and
- (2) The 3% was derived on the basis of LWUA's past experience in the institutional strengthening needs of W.Ds.

These ratios adopted for estimating community development and training cost will allow the province to meet with its needs for community development in the sector management. The following breakdown provides a view of the components under this category.

**Table 10.4.1 Breakdown of Community Development and Training Cost**

Component	% Share of Cost
1. Preparation for Training Activities	10
1.1 Transportation	1
1.2 Technical Assistance	1
1.3 Food	1
1.4 Supplies and Materials including Production of Training Kits	6
1.5 Generation of Training Aids	1
2. Conduct of Training Activities	53
2.1 Transportation	5
2.2 Food	12
2.3 Accommodation	33
2.4 Training Room Rental	1
2.5 Miscellaneous	2
3. Field Visits to Support BWSA Formation	37
3.1 Transportation	5
3.2 Food	15
3.3 Accommodation	12
3.4 Field	4
Total	100



## 11. FINANCIAL ARRANGEMENTS

### 11.3 Additional Funding Requirements

#### Percentages for Annual Investment

Percentages of annual investment for different fields of implementation activities are assumed for each sub-sector as general indication and summarized in Table 11.3.1. Assumptions on investment timing shall be subject to change, especially for individual projects depending on fund availability and relevant conditions such as land acquisition and institutional set-up.

**Table 11.3.1 Percentages for Annual Investment**

Sub-Sector	Component	1996	1997	1998	1999	2000	Total
Urban Water Supply	Level III System						
	Feasibility Study and Detail Design	50	50	0	0	0	100
	Construction & Supervision	0	20	30	30	20	100
	Community Development & Training	30	20	20	20	10	100
Rural Water Supply	Level I Facility						
	Detail Design	50	50	0	0	0	100
	Construction & Supervision	12	22	22	22	22	100
	Community Development & Training	22	22	22	22	12	100
	Level II System						
	Detail Design	100	0	0	0	0	100
	Construction & Supervision	50	50	0	0	0	100
	Community Development & Training	50	50	0	0	0	100
Sanitation	Urban Household Toilet	12	22	22	22	22	100
	Rural Household Toilet	12	22	22	22	22	100
	Public School Toilet	12	22	22	22	22	100
	Public Toilet	12	22	22	22	22	100
	Disinfection of Level I Wells	12	22	22	22	22	100
	Detail Design	100	0	0	0	0	100
	Construction & Supervision	12	22	22	22	22	100
Community Development & Training	22	22	22	22	12	100	

#### Urban water supply:

- Engineering services for feasibility study and detailed design will be undertaken in the first two years.
- Construction work accompanied by supervisory services will be commenced partially in 2nd year and in full operation from 3rd year to 4th year.
- Community development will take place from the first year.



#### Rural water supply (Level I):

- Engineering services for detailed design will be undertaken during the first two years for Level I and completed within the first year for Level II.
- Construction work accompanied by supervisory services will be partially commenced from the first year and in full operation from 2nd year for Level I, while Level II will be completed within first two years.
- Community development and training will take place from the first year for Level I, while Level II will be completed within the first two years.

#### Sanitation:

- Engineering services for detailed design will be completed within the first year.
- Construction work accompanied by supervisory services will be partially commenced in the first year and in full operation from 2nd year.
- Community development and training will be in full operation from the first year.

### **11.4 Medium-Term Implementation Arrangements**

#### **11.4.2 Alternative Countermeasures**

##### The Local Government Empowerment Fund (LGEF)

The Local Government Empowerment Fund (LGEF) will be established in 1996. Purposes, concept and mechanics of LGEF are discussed below.

##### **(1) Purpose**

- 1) To provide a mechanism for channeling grants and/or concessional loan funds to LGUs
- 2) To rationalize the allocation of funds to priority national projects in support of devolved activities of LGUs over and above their mandated IRA shares
- 3) To effect a more transparent presentation to fund allocations to LGUs in the budget

##### **(2) Concept**

- 1) The LGEF is an umbrella program fund in the GAA (General Appropriation Act) for national government projects being implemented by national government agencies with components supportive of devolved activities of LGUs.

- 2) Projects under the LGEF are to be supported wholly or partially by grants or highly concessional loans such as those from the ADF funds from ADB, which carry zero interest and payable in 40 years. Highly concessional loan is defined as those loans with a grant element of no less than 75%.
- 3) Projects for inclusion in the LGEF will be basically those under the economic and health services sectors.
- 4) As a matter of strategy, to ensure sustainability of LGU support to the project, a "matching fund" of no less than 10% of the total project cost shall be required from the beneficiary LGU. "The matching fund" may be in cash or in-kind.

(3) Mechanics

- 1) Authorization of funds for the eligible projects will be made under the budgets of the implementing agencies following usual budgetary process, rules and regulations.
- 2) The LGEF like MDF (Municipal Development Fund) will be included as one of the items under Assistance to Local Government Units (ALGU) authorized in the GAA. It will likewise identify foreign assisted projects being implemented by national government agencies with components that are directly benefiting specific LGUs, such as the implementation of devolved activities. However, unlike the MDF, fund allocations for LGU projects under LGEF are not to be repaid and are to be treated as subsidies.
- 3) The LGEF will support programs/activities of the 19 priority provinces under the Social Reform Agenda (SRA) and/or those classified as 5th or 6th class LGUs.

**Fund from Tobacco Excise Tax under RA7171**

Contents of "An Act to promote the development of the farmers in the Virginia tobacco producing provinces" (RA7171) are as follows:

- (1) RA7171 was implemented in 1992. Actual allotment started in 1994. Its objective is to advance the self-reliance of the tobacco farmers through the support to the Virginia tobacco-producing provinces.
- (2) An amount of 15% of the tobacco excise taxes on locally manufactured Virginia type cigarettes based on actual collection by the Bureau of Internal Revenue for the second calendar year preceding the year of distribution (namely, the collection in 1992 for 1994

distribution) was allotted to 4 Virginia tobacco producing provinces (Abra, Ilocos Norte, Ilocos Sur and La Union).

- (3) This allotment is treated as a special account under the general fund of LGUs of the provinces to be utilized for (a) cooperative projects that will enhance better quality of products, (b) livelihood projects particularly the development of alternative farming system, (c) agro-industrial projects and (d) infrastructure projects. (Thus, this allotment can be utilized for development of the water supply and sanitation sector although they are not major targeted projects.)
- (4) The allotted amounts to provincial governments and municipalities (unit: 1,000 pesos) in 1994 are shown below.

	<u>Provincial Government</u>	<u>Municipalities (total)</u>
Abra:	12,276	16,367
Ilocos Norte:	16,596	21,647
Ilocos Sur:	47,025*	83,600
La Union:	36,924	49,232

\* Based on the Provincial Annual Report in 1994. Other figures are derived from DBM.

Comprehensive Investment Need Ranking for the Municipalities

Table 11.4.1 Comprehensive Investment Need Ranking of the Municipalities

Municipality	Evaluation Factor						Score by Sub-Sector						Weighted Score by Sub-Sector						Synthetic Investment Need Rankine
	(% of Underserved and Unserved Population of Households)			Urban Sanitation			Urban Water Supply	Rural Water Supply	Urban Sanitation	Rural Sanitation	Urban Water Supply	Rural Water Supply	Urban Sanitation	Rural Sanitation	Urban Water Supply	Rural Water Supply	Urban Sanitation	Rural Sanitation	
	Urban Water Supply	Rural Water Supply	Urban Sanitation	Urban Sanitation	Urban Water Supply	Rural Water Supply	Urban Sanitation	Rural Sanitation	Urban Water Supply	Rural Water Supply	Urban Sanitation	Rural Sanitation	Urban Water Supply	Rural Water Supply	Urban Sanitation	Rural Sanitation	Urban Water Supply	Rural Water Supply	
Aliem	N.A.	59	20	21	0.83	0.80	1.00	0.60	0.20	0.21	0.20	0.25	0.15	0.20	0.05	0.05	0.29	0.81	1
Banayoyo	N.A.	16	0	5	0.56	0.20	0.20	0.20	0.14	0.18	0.10	0.05	0.05	0.05	0.05	0.10	0.43	0.29	31
Bantay	N.A.	27	1	17	0.73	0.40	0.20	0.40	0.23	0.23	0.20	0.10	0.05	0.05	0.05	0.10	0.48	0.43	13
Burgos	N.A.	35	3	12	0.90	0.40	0.20	0.40	0.23	0.23	0.20	0.10	0.05	0.05	0.05	0.10	0.48	0.48	11
Cabugao	N.A.	13	2	2	0.39	0.20	0.20	0.20	0.10	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.25	0.25	33
Candon	N.A.	37	2	1	0.83	0.40	0.20	0.20	0.21	0.21	0.20	0.20	0.05	0.05	0.05	0.05	0.41	0.41	21
Chosyan	N.A.	40	7	39	0.73	0.40	0.20	0.40	0.18	0.18	0.20	0.20	0.05	0.05	0.05	0.20	0.51	0.51	5
Cervantes	N.A.	22	1	11	0.73	0.40	0.20	0.40	0.18	0.18	0.20	0.20	0.05	0.05	0.05	0.20	0.43	0.43	13
Galimuyod	N.A.	11	0	0	0.49	0.20	0.20	0.20	0.12	0.12	0.05	0.05	0.05	0.05	0.05	0.05	0.27	0.27	32
G. del Pilar	N.A.	8	0	0	0.32	0.20	0.20	0.20	0.08	0.08	0.05	0.05	0.05	0.05	0.05	0.05	0.43	0.43	16
Lalida	N.A.	10	4	3	0.39	0.20	0.20	0.20	0.10	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.25	0.25	33
Magsingal	N.A.	24	0	0	0.56	0.40	0.20	0.20	0.14	0.14	0.10	0.10	0.05	0.05	0.05	0.05	0.34	0.34	29
Magbale	N.A.	35	6	44	0.83	0.40	0.20	0.40	0.21	0.21	0.20	0.20	0.05	0.05	0.05	0.25	0.61	0.61	2
Narayan	N.A.	46	2	13	0.83	0.40	0.20	0.40	0.21	0.21	0.20	0.20	0.05	0.05	0.05	0.25	0.51	0.51	7
Quirino	N.A.	63	1	7	0.66	1.00	0.20	0.20	0.17	0.17	0.20	0.20	0.05	0.05	0.05	0.05	0.52	0.52	6
Salcedo	N.A.	23	0	0	0.66	0.40	0.20	0.20	0.10	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.37	0.37	24
San Emilio	N.A.	13	22	40	0.39	0.20	0.20	0.40	0.10	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.50	0.50	8
San Esteban	N.A.	35	7	18	0.66	0.40	0.20	0.40	0.17	0.17	0.20	0.20	0.05	0.05	0.05	0.10	0.42	0.42	17
San Isidoro	N.A.	23	12	7	0.66	0.40	0.20	0.20	0.17	0.17	0.20	0.20	0.05	0.05	0.05	0.05	0.37	0.37	24
San Juan	N.A.	30	2	20	0.56	1.00	0.20	0.40	0.14	0.14	0.10	0.10	0.05	0.05	0.05	0.10	0.54	0.54	4
San Vicente	N.A.	32	0	26	0.49	0.40	0.20	0.20	0.12	0.12	0.10	0.10	0.05	0.05	0.05	0.10	0.42	0.42	17
Santa	N.A.	34	2	11	0.66	0.40	0.20	0.40	0.17	0.17	0.20	0.20	0.05	0.05	0.05	0.05	0.37	0.37	24
Santa Catalina	N.A.	24	4	5	0.66	0.40	0.20	0.40	0.20	0.20	0.20	0.20	0.05	0.05	0.05	0.05	0.41	0.41	21
Santa Cruz	N.A.	30	6	6	0.53	0.40	0.20	0.20	0.14	0.14	0.10	0.10	0.05	0.05	0.05	0.05	0.59	0.59	3
Santa Lucia	N.A.	32	27	10	1.00	0.60	0.20	0.20	0.25	0.25	0.20	0.20	0.05	0.05	0.05	0.05	0.50	0.50	8
Santa Maria	N.A.	47	2	7	1.00	0.40	0.20	0.40	0.17	0.17	0.20	0.20	0.05	0.05	0.05	0.10	0.42	0.42	17
Santiago	N.A.	28	1	14	0.66	0.40	0.20	0.40	0.14	0.14	0.10	0.10	0.05	0.05	0.05	0.05	0.49	0.49	10
Santo Domingo	N.A.	16	2	10	0.56	0.20	0.20	0.20	0.14	0.14	0.10	0.10	0.05	0.05	0.05	0.05	0.49	0.49	10
Sugat	N.A.	0	N.A.	26	N.A.	0.20	N.A.	0.60	N.A.	0.60	N.A.	0.10	N.A.	0.30	0.30	0.40	0.40	23	
Sinait	N.A.	22	0	13	0.32	0.40	0.20	0.20	0.08	0.08	0.05	0.05	0.05	0.05	0.05	0.10	0.33	0.33	30
Sitopon	N.A.	35	11	13	0.39	0.40	0.20	0.40	0.10	0.10	0.05	0.05	0.05	0.05	0.05	0.10	0.35	0.35	28
Suyo	N.A.	29	0	24	0.73	0.40	0.20	0.60	0.18	0.18	0.10	0.10	0.05	0.05	0.05	0.15	0.48	0.48	11
Tagusin	N.A.	22	11	12	0.49	0.40	0.20	0.40	0.12	0.12	0.10	0.10	0.05	0.05	0.05	0.10	0.37	0.37	24
Vigan (Capital)	N.A.	N.A.	9	N.A.	0.66	N.A.	0.20	N.A.	0.33	0.33	N.A.	0.20	N.A.	0.10	N.A.	0.43	0.43	13	
Provincial Total	N.A.	29	6	11															

Note: (1) Scoring to Underserved and Unserved Percentage. (2) Assumed Weight by Sub-Sector for Synthetic Evaluation by Municipality.

Score	Range of Underserved and Unserved Percentage	0.25	0.25	0.25	0.25	Allocated Weight
1.0	61 < % < 81	< %	81 < %	81 < %	41 < %	
0.8	51 < % < 60	61 < % < 80	61 < % < 80	31 < % < 40		
0.6	41 < % < 50	41 < % < 60	41 < % < 60	21 < % < 30		
0.4	21 < % < 40	21 < % < 40	21 < % < 40	11 < % < 20		
0.2	% < 20	% < 20	% < 20	% < 10		



12. MONITORING

12.4 Evaluation of Plan Implementation and Updating the PW4SP

Table 12.4.1 Draft Formats for Annual Sector Performance Summary Report (Provincial and Municipal Levels)

Form P-1

Province of \_\_\_\_\_  
Provincial Water & Sanitation Monitoring System  
 Annual Sector Performance Summary Report  
 Period Covered : \_\_\_\_\_ to \_\_\_\_\_

I. Service Coverage

Municipality (1)	LAST YEAR				THIS YEAR			
	Population (2)	Persons with Safe Water & Sanitary Toilets (3)	Persons with Safe Water Only (4)	Persons with Sanitary Toilets Only (5)	Population (6)	Persons with Safe Water Only (7)	Persons with Safe Water Only (8)	Persons with Sanitary Toilets Only (9)
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
Total								
% Served								
Targets								

II. Sources & Uses of Capital Development Funds

Source of Fund (1)	Budget for Water Supply & Sanitation (2)	Actual Disbursement (3)	Uses of Funds							
			Water Source Development (4)	Water Supply Transmission (5)	Water Storage/ Treatment & Distribution (6)	Household Toilets (7)	School Toilets (8)	Public Toilets (9)	Others (10)	
A. Local Funds.										
Provincial Funds										
Municipal Funds										
A.										
B.										
C.										
D.										
E.										
F.										
G.										
H.										
I.										
J.										
SUB-TOTAL										
B. National Funds										
DPWH										
DOH										
LWUA										
SUB-TOTAL										
C. External Funds										
NGO										
NGO										
NGO										
SUB-TOTAL										
TOTAL										





V. Water Resources: Report any major changes in the availability and quality of water in the province. Attach map.

VI. Unit Cost Summary : Based on projects actually implemented and paid for during the reporting period, indicate the following average unit costs

1. Shallow Well (w/o hand pump) = \_\_\_\_\_ / Meter Depth
2. Deep Well (w/o pump) = \_\_\_\_\_ / Meter Depth
3. Pipeline = \_\_\_\_\_ / meter
4. Storage Tanks =
5. Others,

Municipality of \_\_\_\_\_  
 Provincial Water & Sanitation Monitoring System

Annual Sector Performance Summary Report

Period Covered : \_\_\_\_\_ to \_\_\_\_\_

I. Service Coverage

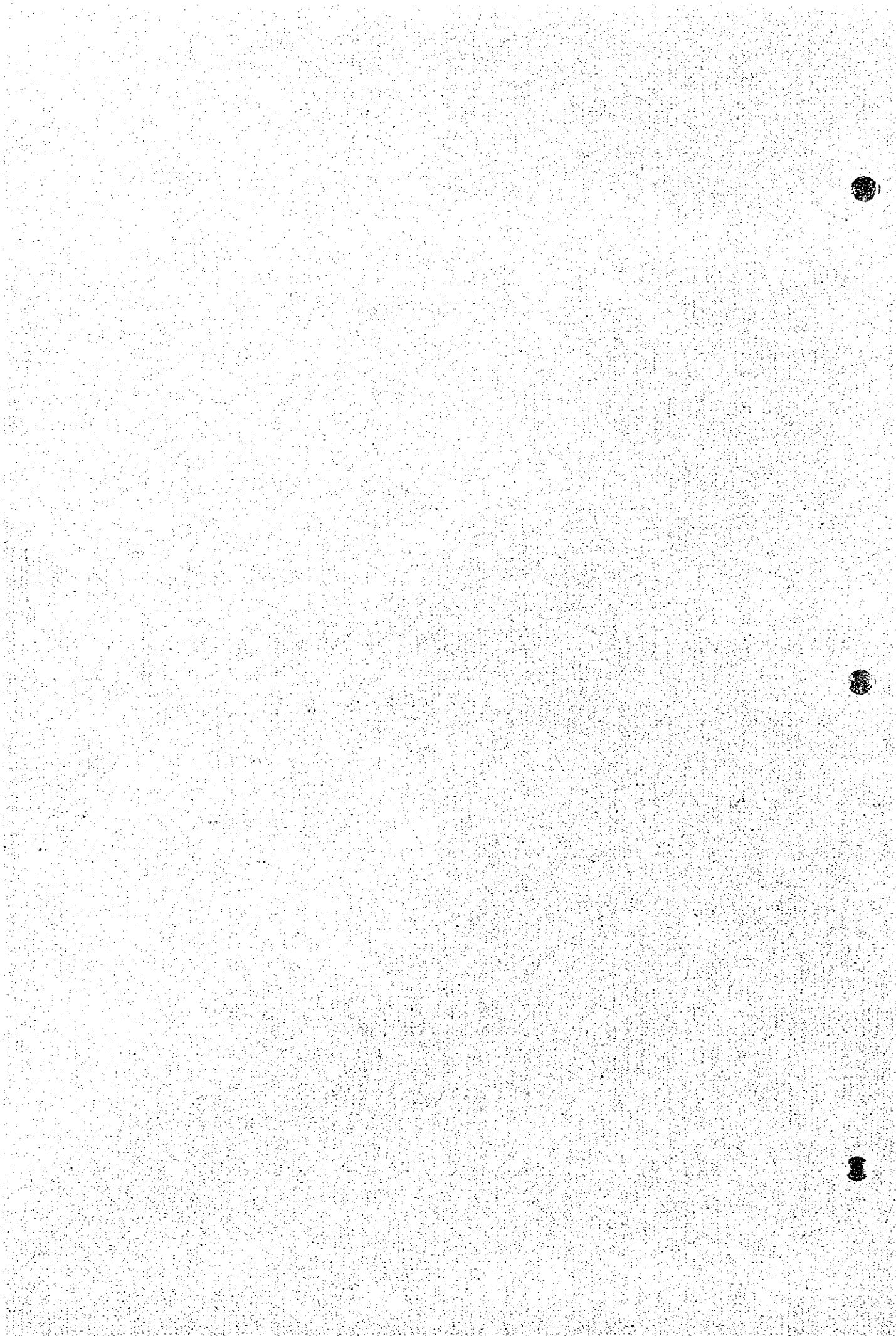
Name of Barangay (1)	LAST YEAR				THIS YEAR			
	Population (2)	Persons with Safe Water & Sanitary Toilets (3)	Persons with Safe Water Only (4)	Persons with Sanitary Toilets Only (5)	Population (6)	Persons with Safe Water & Sanitary Toilets (7)	Persons with Safe Water Only (8)	Persons with Sanitary Toilets Only (9)
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
Total								
% Served								

II. Sources & Uses of Capital Development Funds.

Source of Funds (1)	Budget (2)	Actual Disbursement (3)	Uses of Funds							Others (10)	
			Water Source Development (4)	Water Supply Transmission (5)	Water Storage/ Treatment & Distribution (6)	Household Toilets (7)	School Toilets (8)	Public Toilets (9)			
Municipal Funds											
Barangay Funds											
A.											
B.											
C.											
D.											
E.											
F.											
G.											
H.											
I.											
J.											
K.											
L.											
M.											
N.											
O.											
P.											
Q.											
R.											
S.											
T.											
U.											
W.											
SUB-TOTAL											
NGO											
NGO											
NGO											
SUB-TOTAL											
TOTAL											

**DATA REPORT**

**DATA REPORT**



1. INTRODUCTION  
 1.3 The Provincial Plan for the Province of Ilocos Sur  
 1.3.2 Outline of the Report

Table 1.3.1 List of the Report/Data/Information/Materials Collected (1/2)

No.	Title	Year	Prepared by	Related Subjects						Remarks
				WS	HD	SE	CD	SE	O	
<b>LAWS AND REGULATIONS</b>										
1	The Local Government Code of 1991	1991	Congress of the Phil.					x		
2	The Code of Sanitation of the Philippines Presidential Decree No. 856	1976	DOH				x			
3	National Handbook on Land and Other Water Resources	Jul-91	NLUC,NEDA						x	
<b>STATISTICS - National Level</b>										
1	1991 Family Income and Expenditures Survey of Households Bulletin Series 72	1991	NSO						x	
2	1992 Philippine Statistical Yearbook	Oct-92	NSCB				x		x	
3	1992 Philippine Yearbook	Dec-92	NSO						x	
4	National Health Survey	1992	DOH					x		
<b>STATISTICS - Provincial Level</b>										
1	1990 Census of Population and Housing Report No. 3-64 D: Socio-Economic and Demographic	1990								
Characteristics of Nueva Vizcaya										
Socio-Economic Profile Province of Ilocos Sur										
<b>NATIONAL DEVELOPMENT PLAN/SECTOR PLAN</b>										
1	Water Supply, Sewerage and Sanitation Master Plan of the Philippines 1988-2000.	1988	NEDA	x	x	x				
2	National Physical Framework Plan 1993-2022.	Oct-92	Natl. Land Use Com.							x
3	Philippines: Water Supply Sector Reform Study.	Aug-93	WORLD BANK	x	x	x				Working Papers
4	Philippine Development Report 1987-1992	1993	NEDA							x
5	Project Benefit Monitoring and Evaluation (PBME).	Oct-93	NJS/Basic Team							x
6	Study for the Groundwater Development in Manila Volume 2.	Jun-92	JICA							Main Report
7	First Water Supply, Sewerage and Sanitation Sector Project BWSA Package Phase I & II.	Mar-93	DILG-PMO						x	Training Manual 2nd Edition
8	The Special Assistance for Project Sustainability Program for Rural Water Supply Project.	Mar-92	OECF			x				Final Report (Main Report) Second Edition
9	BWSA Primer English Version.	Sep-92	DILG,DPWH,DOH						x	Mission Report
10	Database Application for Provincial Water Supply, Sewerage & Sanitation Sector Plan.	Apr-93	WORLD BANK							x
11	Skills Training for Sanitary Engineers	Sep-92							x	Training Manual 1st Edition
12	National Strategy and Action Plan Philippine National Urban Sewerage and Sanitation Strategy and Feasibility Studies Project.	May-93	World Bank Proj. Loan 3242-DH						x	
13	PAG-ASA Climatological Data									x
14	Sanitation and Water Supply: Practical Lessons from the Decade.	1992	Sandy Cairncross						x	Discussion Paper Series
15	Community Water Supply and Sanitation	1989	WHO						x	x

List of the Report/Data/Information/Materials Collected (2/2)

No.	Title	Year	Prepared by	Related Subjects						Remarks
				WS	HD	SE	CD	SE	O	
17	Guidelines for Planning Community Participation in Water Supply & Sanitation Projects.		Anne Whyte				x			
18	Participatory Evaluation : Tools for Managing Change in Water and Sanitation.	Feb-93	Deepa Narayan				x			
19	Community Participation and Hygiene Education on Water Supply and Sanitation (CPHE).	Oct-89	Technical Coop.				x			
21	Geological Maps of the Phils.		BMGS				x			
23	Philippine Atmospheric, Geo-Physical and Astronomical Services Admin. Data.		PAG-ASA				x			
24	Philippine Water Resources Summary Data, Vol.1 Stream Flow and Lake or River Stage.		Bureau of Research				x			
25	Hydrogeology of Central Luzon	Aug-70	BM,Sandoval & Mamani				x			
<b>PROVINCIAL SECTOR PLAN/DEVELOPMENT PROGRAM</b>										
1	Provincial Framework Plan (1993 - 1998)								x	
2	Five-Year Provincial Investment Program Vol. 1 (CY 1993-1998)								x	
3	Municipal Annual Accomplishment Report - Ilocos Sur	1994							x	
4	Provincial Profile	1990							x	
5	Feasibility Study of Sinaat Waterworks - Sinaat, Ilocos Sur						x			
6	Feasibility Study of Santa Water District - Santa, Ilocos Sur						x			
7	PHO Water Supply Inventory Report	1994	PHO				x			
8	Municipal Annual Report - Municipality of Vigan	1994	DILG-Province						x	
9	Municipal Annual Report - Municipality of Bantay		MPDO							
10	Administrative Map (1:150,000) for the Province of Ilocos Sur		NAMRIA				x			
11	Topographic Map (1:50,000) for the Province of Ilocos Sur		NAMRIA				x			
12	Rapid Assessment of Water Supply Sources for the Province of Ilocos Sur		NWRB				x			
13	Groundwater Resources Investigation for the Province of Ilocos Sur		NWRB				x			
14	Geology and Mineral Resources of the Philippines		BMGS				x			
15	Geological Map of the Philippines (1:1,000,000)		BMGS				x			
16	Reconnaissance Hydrogeological Survey of the Province of Ilocos Sur		BMGS				x			
17	Philippine Water Resources Summary Data - Ilocos Sur		DPWH/BRS				x			
<b>OTHER REFERENCES</b>										
1	Microsoft Windows Version 3.1	1992	Microsoft Corporation							x User's Manual
2	Microsoft Excel Version 5.0	1994	Microsoft Corporation							x User's Manual
3	Microsoft Word Version 6.0	1994	Microsoft Corporation							x User's Manual

Related Subject : WS Water Supply, HD Hydrogeology, SE Sanitation and Environment, CD Community Development, SE Socio-Economy, O Others



## 1.4 Acknowledgements

Table 1.4.1 List of Persons and Institutions Who Participated in the Preparation of PW4SP

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7. Mr. Wilfred Foz	Computer Programmer/Encoder	Provincial Planning & Dev't. Office
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2. Ms. Ellen I. Pasqua	Asst. Program Manager	- do -
3. Mr. Rogelio B. Ocampo	Chief, Planning Division	- do -
4. Mr. Mario V. De Dios	Development Management Officer V	- do -
5. Ms. Fe Crisilla M. Baniata	PW4SP Project Officer	- do -
6. Ms. Vivian B. Biala	Coordinator	- do -

