

Salumay Water System

Friday, 06 March 2009

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A FEASIBILITY STUDY REPORT
ON THE PROPOSED IMPLEMENTATION
OF THE SALUMAY POTABLE WATER
SYSTEM PROJECT

Located in Barangay Datu Salumay

Marilog District, Davao City

EXECUTIVE SUMMARY

The proposed SALUMAY POTABLE WATER SYSTEM PROJECT is a gravity –type level-2 system which will be supported by a spring with a current yield of 1 liter per second. The system will be using 50% of the gauged yield. Below is a matrix showing a brief description of the project.

Name of the proposed project

Datu Salumay Potable Water System
Project

Location of the project

Datu Salumay, Marilog District, Davao City

Number of proposed HH beneficiaries

200 Households

Number of identified covered sitios

2 sitios

Average Household Size

5

Average Annual Population Growth Rate

3%

Current Sources of Household Water Needs

Intermittent Spring, rain water and surface water

Percentage of proposed HH beneficiaries with sanitary facilities

85%

Heath Situation

Diarrheal diseases ranked sixth as cause of mortality among children below 5 years old.

Source
:

2004 BLGU data on the leading causes of Mortality among children below 5 years old.

Based from the initial study made on the proposed project, the Salumay PWS can supply the water needs of the community even up to a span of 5 years using 90% of the current spring yield. The assumption made on this claim is for each of the beneficiary to make use of the ideal clean and potable water for cooking, drinking and other household use.

Recommendation : Based from the result of the initial study made, the proposed project DATU SALUMAY POTABLE WATER SYSTEM recommended for project Implementation.

STAFF
IDENTIFICATION : Engr. Nazario R. Cacayan

POSITION
: Executive Director, Yamog, Inc.

SUBJECT : REPORT ON THE PROPOSED DATU SALUMAY SPRING
DEVELOPMENT

PROJECT

I. BRIEF DESCRIPTION OF THE CITY OF DAVAO

The CITY of DAVAO

is located in the south-eastern part of the province of Davao del Sur (please see attached Map). It is bounded in the north by the city of Panabo and the municipality of Arakan in the west; and the municipality of Sta Cruz, Davao del Sur in the southerly portion of the City. The City of Davao could be reached by all types of land vehicles through a well-paved all-weather road. Davao City has one hundred eighty six (186) barangays and has a total population of 1.2 million (data gathered thru city planning and development office).

There are two main geographical districts of the city, namely: upland and low land districts. The lowland district is predominantly an agri-business area. Most of the production sites are linked to the market via a network of highly-distressed all-weather sand and gravel road. On the other hand, the upland district practices the slash and burn technology for agriculture. Corn and vegetables are the primary produce. The Davao River and Lasang River served as the source of irrigation water for the lowlands.

Based on the CY 2001 Data on Water Supply, the city of Davao has a total of 334,000 households. Of this figure, only households or an approximate 57% (of the total households) have direct access to both Levels 1, 2, and 3 Potable Water Sources.

II. BRIEF DESCRIPTION OF THE BARANGAY DATU SALUMAY

Barangay Salumay is one of the upland villages of Davao City. It is nestle at the upper section of the Mt. Talomo mountain range and is bordered by barangays Buda in the north; and Baganihan in the south.

Based from the CPDO records , the village has a total population of 2,897 individuals. Majority of the population is composed of Christians and Indigenous peoples, while the ata Manobos comprise the major ethnic group of the area.

Corn and vegetables are the primary produce of the village. The residents practice Slash and burn technology for agricultural purposes (please see attached picture). Intermittent springs and inland water support the irrigation requirement of the above-mentioned crops.

Datu Salumay could be reached from Barangay Ulas by upland vehicles through a well asphalted road – the Davao - Bukidnon Road National Highway. Aside from established Public Utility vehicles such as buses and jeepneys; “Habal Habal and Skylab” are the two popular mode of transportation among the residents going to other sitios of the barangay.

III. HEALTH AND SANITATION SITUATION OF BARANGAY DATU SALUMAY

Base from reports, 85% of the Household have sanitary facilities (water sealed toilets). The said scenario compliments the presence of adequate and effective health and sanitation program implemented in the Barangay. This is a result of the unrelentless cooperation given by the residents to the Barangay health program manage by brgy. Health

workers. It was also noted that diarrheal diseases ranked sixth as a cause of mortality for children below 5 years old.

IV. EXISTING POTABLE WATER SOURCE

The household water needs of the village depend on rain water, surface water and intermittent springs flowing out of the mountain sides. Water from these sources are piped-in through PE pipes (see picture attached) to communal stands where households could fetch their water requirements.

Based on the 5 years Barangay Development Plan report, three (3) existing potable water system in the village. However, only 28% of the households are effectively served by the water system it is so because of the absence of a comprehensive project feasibility study (technology development and social adaptability).

The village has sources of potable water as observed during the conduct of the Ocular survey. However, water not reaching the center of the village is a threat due to the absence of an effective technical design resulting to waste of funds as seen in the 3 existing water system.

V. THE PROPOSED DATU SALUMAY POTABLE WATER SYSTEM

There are two (2) sitios to be covered by the proposed Potable Water System. Presented in Table 1 are the sitios covered including the of households to be benefited.

Table
1: Sitios
covered including the number of HH beneficiaries.

SITIOS COVERED

NUMBER OF HH

BENFICIARIES

(HH UNIT)

Purok 1

92

Purok 2

108

TOTAL

200 HH

The proposed system is categorized as gavity type. It will be supplied

by a spring located at an altitude of 1240 meters above sea level (masl) at a latitude of North 6 degrees 33 minutes and 42.2 seconds ; and a longitude of East 124 degrees 28 minutes and 34.3 seconds. The spring has a yield of approximate 2 liters per second and was gauged November 21,2005 about 90% of the yield will be used for the systems.

The center of the barangay is approximately 1225 meters above sea level (masl) at a latitude of North 6 degrees 33 minutes and 21.1 seconds, and a longitude of East 124 degrees 28 minutes and 34.5 seconds.

Below is a matrix showing the proposed structures for inclusion in the design of the system:

Table
2: Structural
considerations for the system.

STRUCTURES AND OTHER

SYSTEM PARTS

DESCRIPTION

Intake box

The intake box shall be constructed at the spring source. The structure has a natural filtering chamber with natural filters (e.g. charcoal, pebbles, stones, sand). The filters will ensure that

odor, undesirable taste, color and sediments are eliminated prior to storage in the reservoir.

Break Pressure Tank

The Break Pressure Tank is constructed purposely to break high pressure caused by differences in elevation between two major nodal points.

Reservoir

The reservoir is a structure that is used to store water for distribution

Valve Box

The valve box is constructed to prevent the valves (e.g. globe valve, check valve, butterfly valve, etc.) from damage.

Water Mains and Laterals

Water mains and laterals are the pipes to be used to convey water from the Intake Structure to the Reservoir to the distribution taps.

Taps and Wash Tubs

These are complimentary structures where each household fetches their water needs and do their laundry. It consists of a tap, a drain pit, and a wash tub.

VI. DEMAND

VI. 1. WITHOUT THE PROJECT

Considering the distance and the nature of the current sources of potable water needs in the community, it is estimated that the water requirement of the residents without the project range from 20 liters per capita per day 25 liters per capita per day or an average of 25 liters per capita per day. The proposed project will benefit a total of 200 households from the identified 2 puroks. Average household membership is five (5) with an average annual population growth rate 3%. Below is a table showing the project water demand of the identified beneficiary sites without the project.

Table
3:
Project Water Demand without the project.

NUMBER OF YEARS

PROJECTED

POPULATION

PROJECTED WATER CONSUMPTION

(lpcd)

1

667

16675

2

687

17175

3

707

17675

4

728

18200

5

749

18725

V1.2. WITH THE PROJECT

When the project will be in full operation, the average water consumption of the identified beneficiary sites will be increased to 60 liters per capita per day. This will result to change in lifestyle of the people by improving their health and sanitation as result as well as having time saved (from water fetching) for productive activities (e.g. backyard livestock production, backyard gardening, etc..) as well as quality time for the family. The children on the other will be able to attend regular classes in the school. Below is a table showing the projected water demand of the identified beneficiary sites with the project.

Table
4: Project
Water Demand with the project.

NUMBER OF YEARS

PROJECTED

POPULATION

PROJECTED WATER

CONSUMPTION

(lpcd)

1

667

40020

2

687

41220

3

707

42420

4

728

43680

5

749

44940

VI.3. DEMAND AND SUPPLY GAP

The 200 household beneficiaries identified from the two puroks of Barangay Datu Salumay will sufficiently enjoy potable water requirement of 60 liters per capita per day. Based from a

projected population with an annual population growth rate of 3%, it could be gleaned from table 5 that the system could still efficiently and effectively deliver the water needs of the beneficiaries even at the end of the fifth year.

Table
6 : A comparison
of the demand and supply without and with the project.

NUMBER OF YEARS

WITHOUT THE

PROJECT

WITH THE PROJECT

1

0

26700

2

-1525

23040

3

-2300

21180

4

-3125

19200

5

-3950

17220

The table shows that with the development of the spring, the water will be more than enough to support the household needs of the identified beneficiaries. At the end of the 5th year, an excess of 8,520 liters per day could still be recorded from the system using 50% of the recorded spring yield.

VI.4. DEMAND AND SUPPLY ANALYSIS

Below is a table showing an analysis of the demand versus supply with the project and without the project.

Table
7:Demand
and Supply Analysis Table.

Name of the project : Datu Salumay Potable Water System
Project

Location of the project :
Datu Salumay, Marilog District, Davao
City

Proposed Household Beneficiaries : 200 Households

Spring yield proposed for use : 90% of the current spring yield

DEMAND
ANALYSIS

PARTICULARS

WITHOUT THE PROJECT

WITH THE PROJECT

Estimated water Requirement per
Capita per Day

25 liters per capita per day

60 liters per capita per day

Project Domestic Water Demand

28,228 lpcd

28,228-44,428 lpd

SUPPLY
ANALYSIS

PARTICULARS

WITHOUT THE PROJECT

WITH THE PROJECT

Potential system yield per day

0

86, 400 lpd

HH with direct access to water

119
households

200
Households

Percent to the Total number of
households

60%

100%

Average Time spent in Fetching

40 minutes

15 minutes

Monthly Bill

Php 30.00
but still to be discussed and verified with the beneficiaries.

Noted : the Php 30.00 water fee per month was gathered from the result of an initial interview with some of the identified beneficiaries.

VVI. IMPACT TO WOMEN

During the conduct of Ocular Survey, it was found out that women and children do the regular fetching of water at makeshift taps. It was also known that an average of 40 minutes is spent for fetching water per session. There are three (3) fetching sessions per day namely: morning, noon and dusk/evening.

If the system be pursued, fetching time will be shortened by an average of 25 minutes. Presented below is table 3 showing quarterly and annual losses incurred in terms of time and monetary values.

Given
:

Local
Wage Rate : Php 150.00

Number
of Working Hours : 25 minutes

Table
8 : Losses
incurred in fetching water in terms of time and monetary values per Household.

CALENDAR MONTH

LOSSES IN TERMS OF TIME VALUE

(in Hour
unit)

LOSSES IN TERMS OF MONETARY VALUE

(in Peso unit)

January

38.75

726.56

February

36.25

679.69

March

38.75

726.56

April

37.50

703.12

May

38.75

726.56

June

37.50

703.12

July

37.50

726.56

August

38.75

703.12

September

37.50

703.12

October

38.75

726.56

November

37.50

703.12

December

38.75

726.56

Total

456.25

8,554.69

Analysis: Should the system be pursued, the following will be the benefits derived By women in terms of system use.

.
Women and children will be able to save a total of 456.25 annually (per household) fetching water.

.
Women will be able generate a total additional income of Php. 8,555.00 annually (per

household) from productive time use (both in cash and in kind).

.

Children will now be able to attend regular class sessions in school.

VIII. OTHER BENEFITS DERIVED FROM AN IMPROVED POTABLE WATER SOURCE

Given:

Local Wage Rate : Php 150.00

Present Number of Household
HH : 199

Average Household Size
Members : 5

Morbidity Rate :
6% (from MPDO,2001 record)

LFPR :
68%

Water Fee per
Household :
Php 15.00 per month

Annual
number of Working days :315

Annual
Wage Rate : Php 47,250.00

Number
of days inactive per year due to water related diseases:7 days

Medical
Expense : Php 1,000.00

Note:

Some of the data above are the result of an interview conducted during the visit Visit in the area.

For an improved potable water source, other benefits derived from it includes the

Following:

1. Economic Water Revenue

2. Reduction in Morbidity

3. Savings in Medical Expenses

Economic Water Revenue : Php 35,820.00

Reduction in Morbidity : Php 22,576.00

Savings in Medical Expenses : Php 24,358.00

Analysis

: With an improved water system, the community will be able

To generate additional benefits of Php 35, 820.00 (for Economic

Water Revenue); Php 22, 576.00 (for Reduction in Morbidity); and

Php 24, 358.00 (for Savings in Medical Expenses).

Formula Used :

Economic Water Revenue: Served Household x Water Fee per Month x 12 Months.

Reduction in Morbidity : Served Population x Morbidity Rate

X Percentage of economically active population x Daily Wage Rate x Days Inactive x 60%

Savings in Medical Expenses : Served Population x Morbidity Rate x Percentage of economically active Population x Medical Expense incurred x 60%.