APPENDIX M15-1: MAKAINIS HEALTH CENTER CONSTRUCTION

IBNA Needs Detailed Profiling

1. Title and Location

Health Center Construction in Barangay Makainis, Municipality of Salipada K. Pendatun, Maguindanao Province

2. Present Situation and Needs

The Municipality of Gen. Salipada K. Pendatun is a third class municipality in the province of Maguindanao. According to the 2007 National Census, it has a population of 36,038 people and politically divided into 17 barangays. It is located approximately 18 kilometers northeast portion of the Tacurong-Matalam National Highway. It is bounded by municipality of Pagalungan at the north, by municipality of Lambayong, Sultan Kudarat at the west, by municipalities of President Quirino and Buluan at the south, and municipality of Paglat at the east. The Gen. Salipada K. Pendatun municipality covers more than one-third of the Ligawasan Marsh.

Barangay Makainis is one of the barangays of Gen. Salipada K. Pendatun, it has a population of 1,823 persons based on the 2007 National Census. The total land area of Barangay Makainis is 2,787 hectares. It is located at approximately 3.0 kilometers and a few minutes drive to the Poblacion of Gen. Salipada K. Pendatun. There are no regular public utility jeepneys plying the area except for single motorcycle as their mode of transportation. The motorcycle fare is Php 10 to the Poblacion, and Php 40 to Tacurong-Matalam National Highway per passenger.

The economy of Barangay Makainis is largely based on agriculture particularly rice and corn. Fishing is the second biggest income earner due to proximity of the Ligawasan Marsh, notable catches are tilapia, mud fish, carp, and shrimps. Agricultural products are coconut, banana, fruit trees, vegetables and other crops. Aside from farming and fishing, labor works, and other small scale business are the secondary source of income by the populace to augment their income for their daily basic needs.

Its plain area and fertile soil is suited to rice production, however it remain underdeveloped since it is always been affected by war between the government troops and the Moro Islamic Liberation Front (MILF) of the nearby municipalities. In addition, Barangay Makainis problems focused on its health in the community. According to the residents, the leading illness is flu/fever and headache, colds/cough, stomach ache, diarrhea, and skin diseases.

Based on the socio-economic profile, an estimate of 32 percent of households are still livings in sub-standard housing. Ten percent of children under 5 years old are severely underweight. Causes of death among children are diarrhea, bronchitis, measles, malnutrition and pneumonia. Other sicknesses are skin allergies, sore eyes, influenza, chicken pox, and respiratory infections. The barangay has no health center, and the nearest government institution for health care is the Rural Health Center (RHU) located at Poblacion. There are assigned midwives at Barangay Makainis, but they are only coming to the area at once a week because of unavailability of barangay health center.

Presently, the barangay has no public health center where the resident can use in times of emergency. They are bringing their patient to the hospital in the municipality of Isulan, Province of Sultan Kudarat, approximately 45 kilometers from Barangay Makainis. The cost of hospitalization is more than PhP 1,000 per medication. Some residents cannot afford the cost of medication and they would use herbal medicine.

The project aims to provide a Community Health Center facility to all residents at Barangay Makainis. The proposed facility will be used for medical consultations and regular health center check-up for people in the area. This project will provide the construction of 6m x 8m (48m²) community health

center building with office space and a comfort room. The construction of the barangay health center is within the premises of Amboling Primary School.

The facility would help the residents in the community reduce cost of medication, improve the accessibility to health, and affordable health care. The health center will provide the farmer an access to health service especially for the children. It will provide them substantial cost savings by eliminating opportunity time losses by concentrating on their daily livelihood work activities.

3. Project Concept

This particular subproject would consist of several components.

1. Construction of 1 unit Barangay Health Center measure 6.0m x 8.0m, with two (2) rooms and comfort room, and;
2. Installation of water and electrical facilities, and procurement of office supplies such as tables and chairs; and
3. The construction of deep well, and installation of hand pump for barangay health center.

4. Benefits

The project will directly benefit the approximately 2,000 residents of Barangay Makainis. The building facility will provide the community with a place where to conduct community health care, regular medical check up and consultation, and other medical health services, especially the vaccines for children. The delivery of rural health which is consistent and adequate is the government best line of defense against the spread of diseases.

The health center will provide public health services in the barangay of basic health care, family planning services, maternal and child health care, nutrition, and communicable and non communicable disease prevention and control. Moreover, it provides the residents with significant valuable time and money savers.

5. Potential Risks

The possible project risk can be attributed if the proposed health center building can not maintain by the local government units (LGU). Likewise, if no regular government workers such as midwife, and health workers are assign at barangay.

6. Costs Estimates

The initial estimated cost of the project is Php 0.55 million and broken down as follows:

WORK DESCRIPTION	Total Cost
1. The construction of one (1) unit Barangay Health Center measure 6.0m x 8.0m (48 m²), with two (2) rooms and comport room	PhP 0.40 M
2. Supply of office supplies such as tables and chairs	PhP 0.06 M
3. Construction of deep well, and hand pump installation	PhP 0.04 M
Total	PhP 0.50 M
10% Contingency	PhP 0.05 M
Total Estimated Cost	**PhP 0.55 M**

7. Costs-benefit Analysis

The Annual Population Growth Rate of Maguindanao Province is 6.99%, based on the 2007 National Census.
Growth rate (r) is 6.99%.
Number of beneficiaries is 2,000 persons more or less.

Project Life is 15 years.
Solving the projected population using formula $P_j = P*(1+r)^n$; where: r = growth rate; n = no. of years.
Below is the computation of projected annual population:
Table 1

Year	Projected Population $= P*(1+r)^n$
1	2,000
2	2,140
3	2,289
4	2,449
5	2,621
6	2,804
7	3,000
8	3,209
9	3,434
10	3,674
11	3,931
12	4,205
13	4,499
14	4,814
15	5,150

- **Cost**

Initial Cost: PhP 0.55 Million.
Operation and Maintenance:

a) Assume cost of maintaining the building and medicines at PhP 5,000/month*12month= PhP 60,000/year including labor cost. Assume an increase of 5% per annum.
b) Assume cost of a health workers Php200/day*25 days*12= PhP 60,000 per year. Assume an increase of 5% per annum.
   Total cost=maintenance cost+ worker cost=PhP120,000.

Below is the computation of projected operation and maintenance annual cost:
Table 2

Year	Total O&M Cost projected at 5% per year (PhP)
1	120,000
2	126,000
3	132,300
4	138,915
5	145,861
6	153,154
7	160,811
8	168,852
9	177,295
10	186,159
11	195,467
12	205,241
13	215,503
14	226,278
15	237,592

- **Benefits**

Savings in the Cost of Transportation:
Using the data from Table 1, the projected population

a) Assume that PhP 50 is saved for transportation of 25% of the population at thrice a year
b) Assume the transportation cost is PhP 50*3*2 (vice versa)
c) The total cost of transportation save is PhP 300, and increasing at 5% yearly

Below is the computation of product transport cost savings:
Table 4

Year	Projected Population of 25% (Table 1)	Annual Tansport Cost (PhP)	Total Annual Transport Saving Cost (PhP)
1	500	300	150,000
2	535	315	168,509
3	572	331	189,302
4	612	347	212,661
5	655	365	238,903
6	701	383	268,382
7	750	402	301,499
8	802	422	338,703
9	858	443	380,497
10	918	465	427,448
11	983	489	480,193
12	1,051	513	539,447
13	1,125	539	606,012
14	1,203	566	680,791
15	1,288	594	764,797

- **Computation of Net Present Value, (NPV), and Internal Rate of Return (IRR)**

Assume the opportunity cost (oc) of capital cost is 10%.
All values are in million pesos.
Table 4

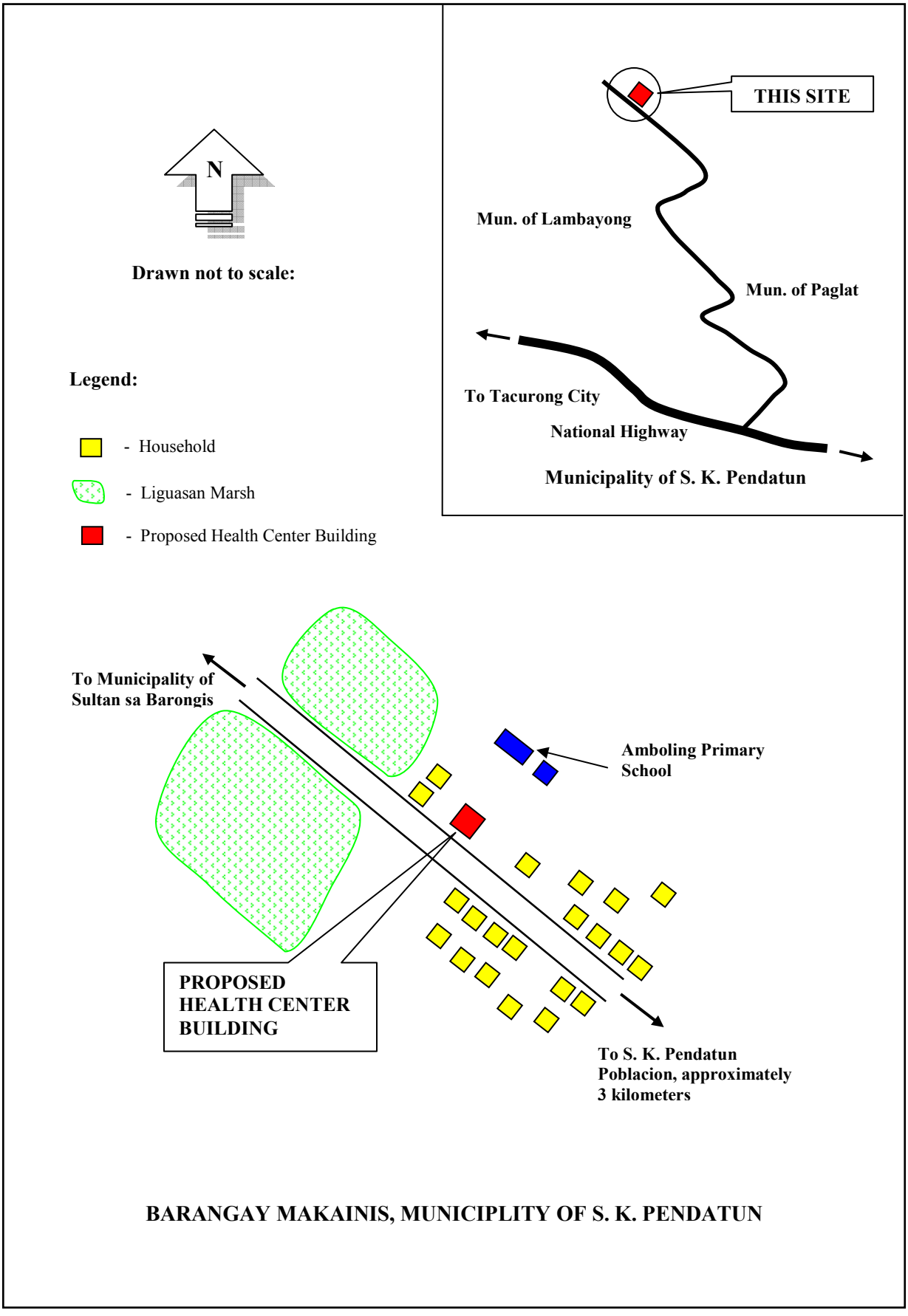
Year	**Cost**			**Benefit**		**Total Cash Flow**	**NPV TCF/ $(1+oc)^n$**
	Initial Invest-ment	O&M (Table 1) (PhP)	Subtotal Cost (PhP)	Saving Cost of Medicine (Table 3)	Subtotal Benefit (PhP)		
T	0.55		0.55			-0.51	-0.51
T-1		0.12	0.12	0.15	0.15	0.03	0.03
T-2		0.13	0.13	0.17	0.17	0.04	0.04
T-3		0.13	0.13	0.19	0.19	0.06	0.04
T-4		0.14	0.14	0.21	0.21	0.07	0.05
T-5		0.15	0.15	0.24	0.24	0.09	0.06
T-6		0.15	0.15	0.27	0.27	0.12	0.07
T-7		0.16	0.16	0.30	0.30	0.14	0.07
T-8		0.17	0.17	0.34	0.34	0.17	0.08
T-9		0.18	0.18	0.38	0.38	0.20	0.09
T-10		0.19	0.19	0.43	0.43	0.24	0.09
T-11		0.20	0.20	0.48	0.48	0.28	0.10
T-12		0.21	0.21	0.54	0.54	0.33	0.11
T-13		0.22	0.22	0.61	0.61	0.39	0.11
T-14		0.23	0.23	0.68	0.68	0.45	0.12
T-15		0.24	0.24	0.76	0.76	0.53	0.13

Solving for NPV, and IRR;
NPV = ∑Cash Flow (T-n)/ $(1+oc)^n$-T, (n=1-15)
NPV = 0.62

IRR = r ;where ∑Cash Flow (T-n)/ $(1+r)^n$-T=0, (n=1-15)
IRR = 19.7%

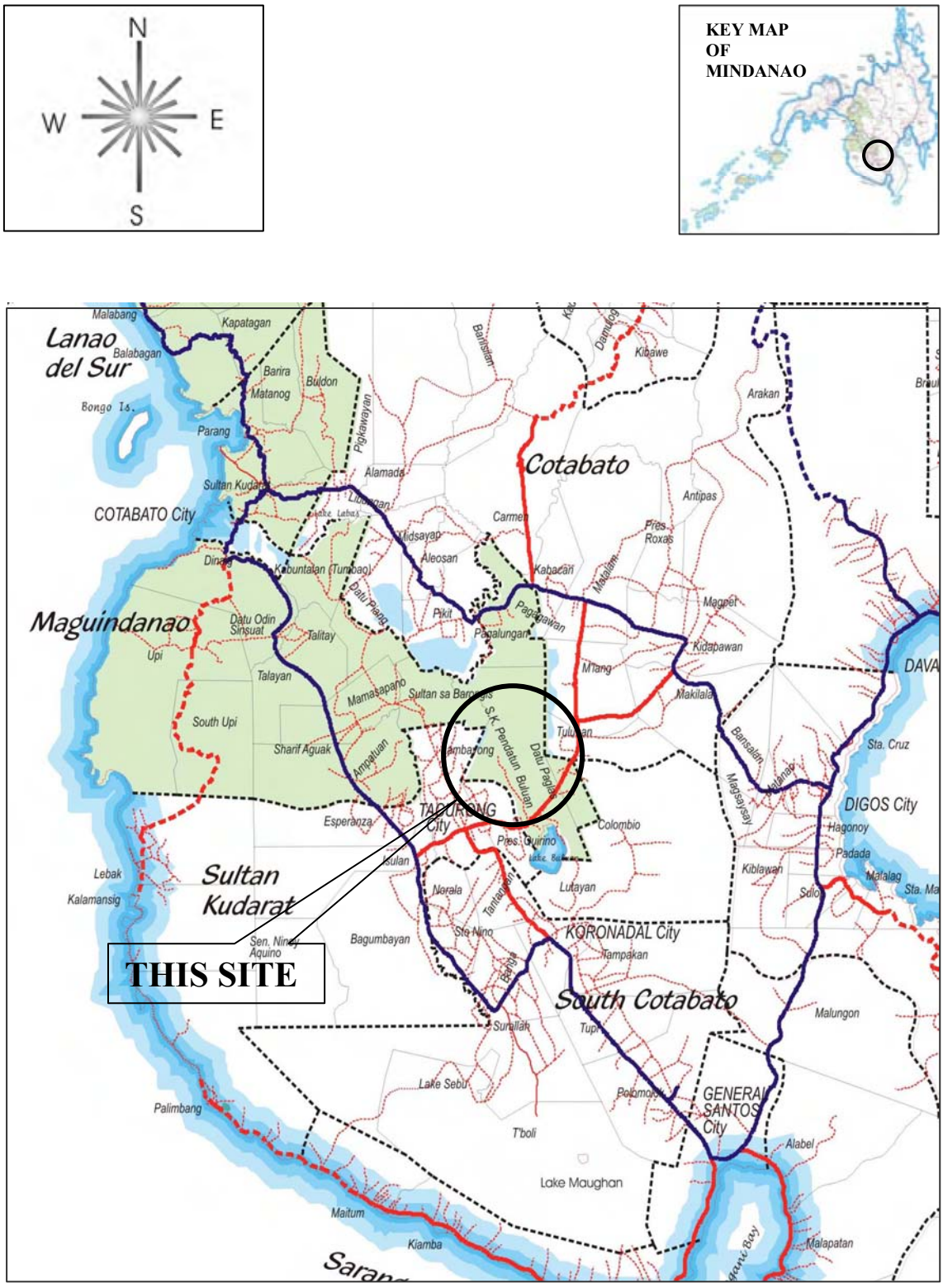
8. Attachment
Attached is the project location map, of the proposed Makainis Health Center as well as captioned photographs.

VICINITY MAP



BARANGAY MAKAINIS, MUNICIPLITY OF S. K. PENDATUN

LOCATION MAP



MUNICIPALITY OF S. K. PENDATUN, MAGUINDANAO PROVINCE

PHOTOGRAPHS

PROPOSED LOCATION OF HEALTH CENTER BUILDING

APPENDIX M16-1: MALATIMON BAKERY LIVELIHOOD

IBNA Pre-Feasibility Study

1. Title and Location

Bakery Livelihood in Barangay Malatimon, Municipality of Ampatuan, Maguindanao Province

2. Present Situation and Needs

The municipality of Ampatuan is a 4th class municipality in the province of Sarangani, Philippines. According to the 2007 census, it has a population of 33,702 people consisting of 11 barangays. Ampatuan Municipality is predominantly an agricultural community, majority of its population derive its income from agricultural production.

Barangay Malatimon is one of the barangays of municipality of Ampatuan. The total land area is approximately 1,323 hectares, of which 1,262 hectares (95.3%) are agricultural lands. It is approximately 6.5 km away from the Cotabato – Gen. Santos National Highway. The mode of transportation is the single motorcycle. Although it is accessible, the road condition is not so good and this is the reason why the barangay is behind in terms of economic development. The fare for the motorcycle is Php 30 per person, and Php 25 per sack of farm production.

Malatimon has a population of 1,483 persons based on 2007 National Census. Farming comprises around 80% is the main source of income of the people in the barangay, Rice and corn is the main produced. Other crops are mango, banana, peanuts, fruit trees, and vegetables. Aside from farming, their income resources are copra production, fishing, driving and other small scale business. During harvest time, farm products are being sold at buying station neighboring municipalities such as Esperanza, and Isulan, Sultan Kudarat, and Shariff Aguak, the province capitol.

During the In-depth Barangay Needs Analysis (IBNA), one of the prioritized of the community is livelihood opportunity to augment their income for their daily needs. Based on the socio-economic profile, the household income is only ranging from Php 600 to Php 1,000 per month and, it can not sustain the household needs. In this connection, an additional source of income (livelihood) is essential to improve income of residents. The construction of bakery building with complete accessories such oven, mixer, molders, table, and other paraphernalia of bakery making is their top priority.

The livelihood (bakery business) will be operated by Malatimon People's Organization, with 80 members. Their main objective is to provide a livelihood for the members at Barangay Malatimon. There is no bakery at the Barangay Malatimon, they are buying bread, biscuit, cake, and other pastries at the Poblacion approximately 7 kilometer away.

They will employ some of its cooperative members as bakers, saleslady, and sales boy. The sales boy is the responsible for selling the bread through the use of bicycle or any others means of transportation to the households. In addition to the bakery, they will put up also a small coffee shop, and small grocery. Once the project will generate an income, they will form a lending (credit) union.

The project will directly benefit residents and farmers at Barangay Malatimon especially the Malatimon People's Organization and their immediate family members. Likewise, the residents in the community because they no longer go to the Poblacion to buy bread and other important basic needs.

3. Project Concept

This particular subproject would consist of several components.

1. The construction of bakery building of dimension;

2. Purchasing of bakery accessories such oven, mixer, molders, and table;
3. Capital built-up money for the livelihood business

4. Benefits

The project will directly benefit the 80 members of Malatimon People's Organization including their immediate family members, and the number will increase as soon as the project will be successful. The bakery livelihood project in Barangay Malatimon will generate economic benefits in term of employment opportunity with members, and substantial benefits to the residents from lower cost of transportation in buying assorted pastries.

5. Potential Risks

Such an income generating activity requires careful handling for revenue distribution otherwise the project may benefit merely a small group of people and have small impact on the community. Business management training is also indispensable in order to sustain the project.

6. Costs Estimates

The initial estimated cost of the project is Php 0.61 million and broken down as follows:

DESCRIPTION OF ITEM	TOTAL COST
1.) Construction of building	P 0.30 M
2.) Purchasing of bakeries equipment	P 0.20 M
3.) Capital built-up	P 0.05 M
Total	P 0.55 M
10% Contingency	P 0.06 M
Total Estimated Cost	**P 0.61 M**

7. Costs-benefit Analysis

The Annual Population Growth Rate of Maguindanao Province is 6.99%, based on the 2007 National Census.
Growth rate (r) is 6.99%.
Number of beneficiaries is approximately 80 persons.
Assume only 30% of 80 persons will employed: 24 persons.
Project Life is 15 years.

- **Cost**

Initial Cost: PhP 0.61 Million
Operation and Maintenance

a) Assume cost of maintenance of building and other machine is PhP 1,500/month
b) Assume the cost of labor is 40%.

Material Cost: PhP 1,500/month* 12 months= PhP 18,000/year;
Labor Cost: PhP 18,000*0.40 = PhP 7,200
Total Annual Cost: PhP 18,000+7,200 = PhP 25,200, assume increasing at 5% yearly

Below is the computation of projected annual O&M cost:

Table 1

Year	Total Annual O&M projected at 5% = $P*(1+r)^n$ (PhP)
1	25,200
2	26,460
3	27,783
4	29,172
5	30,631
6	32,162
7	33,770
8	35,459
9	37,232
10	39,093
11	41,048
12	43,101
13	45,256
14	47,518
15	49,894

- **Benefits**

2.1 Additional Income

a) Assume an average daily income of PhP 1,000/day, and increasing at 5% yearly.
b) Assume working days are 25days/month*12=300days/year.

Below is the computation of projected annual income:

Table 2

Year	Working Days/Year	Daily Average Income	Annual Income (PhP)
1	300	1,000	300,000
2	300	1,050	315,000
3	300	1,103	330,750
4	300	1,158	347,288
5	300	1,216	364,652
6	300	1,276	382,884
7	300	1,340	402,029
8	300	1,407	422,130
9	300	1,477	443,237
10	300	1,551	465,398
11	300	1,629	488,668
12	300	1,710	513,102
13	300	1,796	538,757
14	300	1,886	565,695
15	300	1,980	593,979

- **Computation of Net Present Value, (NPV), and Internal Rate of Return (IRR)**

Assume the opportunity cost (oc) of capital cost is 10%
All values are in million pesos

Table 3

Year	Cost			Benefit		**Total Cash Flow**	**NPV TCF/ $(1+oc)^n$**
	Initial Investment	O & M (Table 1)	Subtotal Cost	Annual Income (Table 2)	Subtotal Cost		
T	0.61		0.61			-0.61	-0.61
T-1		0.03	0.03	0.30	0.30	0.27	0.25
T-2		0.03	0.03	0.32	0.32	0.29	0.24
T-3		0.03	0.03	0.33	0.33	0.30	0.23
T-4		0.03	0.03	0.35	0.35	0.32	0.22
T-5		0.03	0.03	0.36	0.36	0.33	0.21
T-6		0.03	0.03	0.38	0.38	0.35	0.20
T-7		0.03	0.03	0.40	0.40	0.37	0.19
T-8		0.04	0.04	0.42	0.42	0.39	0.18
T-9		0.04	0.04	0.44	0.44	0.41	0.17
T-10		0.04	0.04	0.47	0.47	0.43	0.16
T-11		0.04	0.04	0.49	0.49	0.45	0.16
T-12		0.04	0.04	0.51	0.51	0.47	0.15
T-13		0.05	0.05	0.54	0.54	0.49	0.14
T-14		0.05	0.05	0.57	0.57	0.52	0.14
T-15		0.05	0.05	0.59	0.59	0.54	0.13

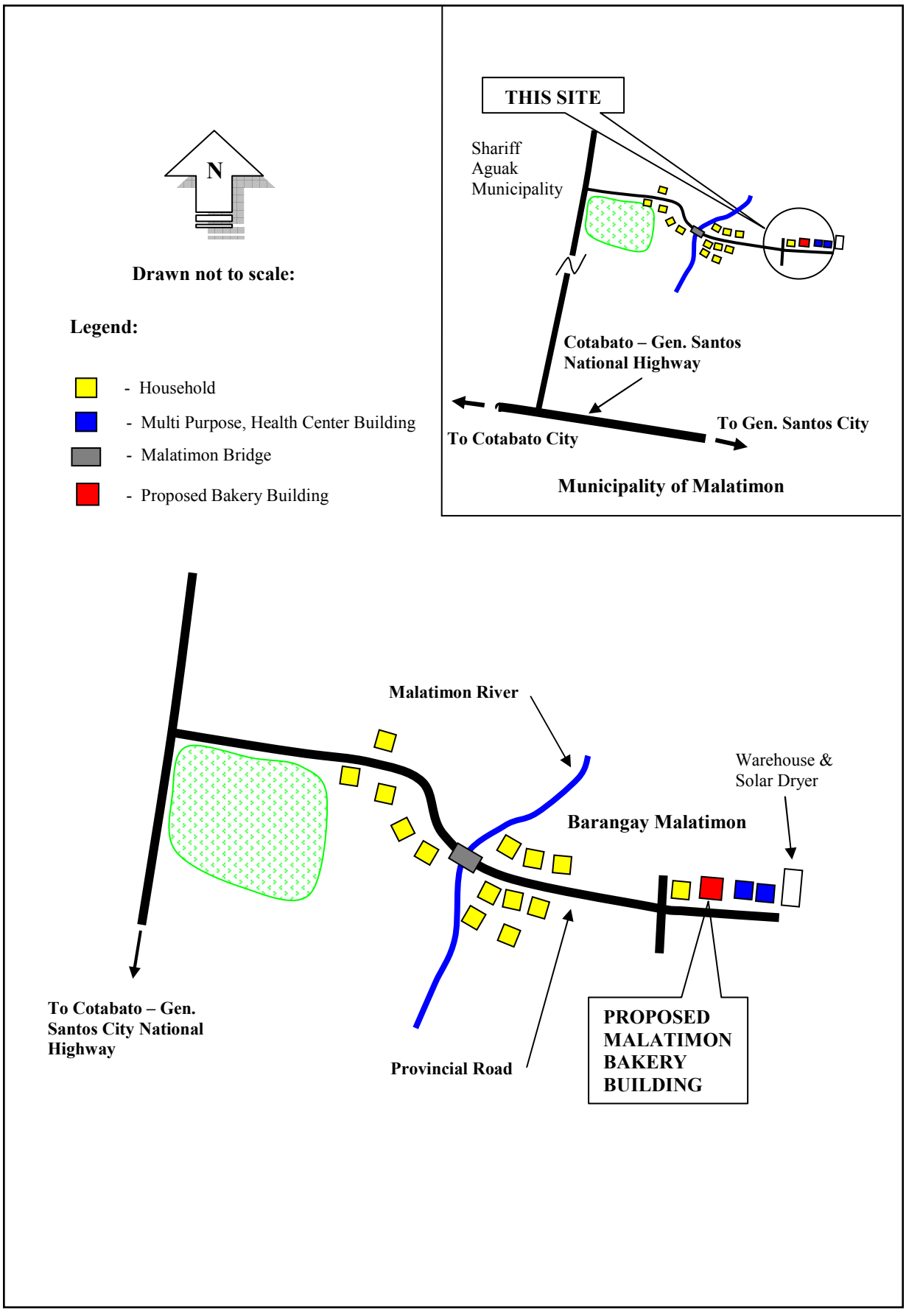
Solving for NPV, and IRR;
NPV = $\sum$Cash Flow (T-n)/ $(1+oc)^n$-T, (n=1-15)
NPV = 2.15

IRR = r ;where $\sum$Cash Flow (T-n)/ $(1+r)^n$-T=0, (n=1-15)
IRR = 49.8%

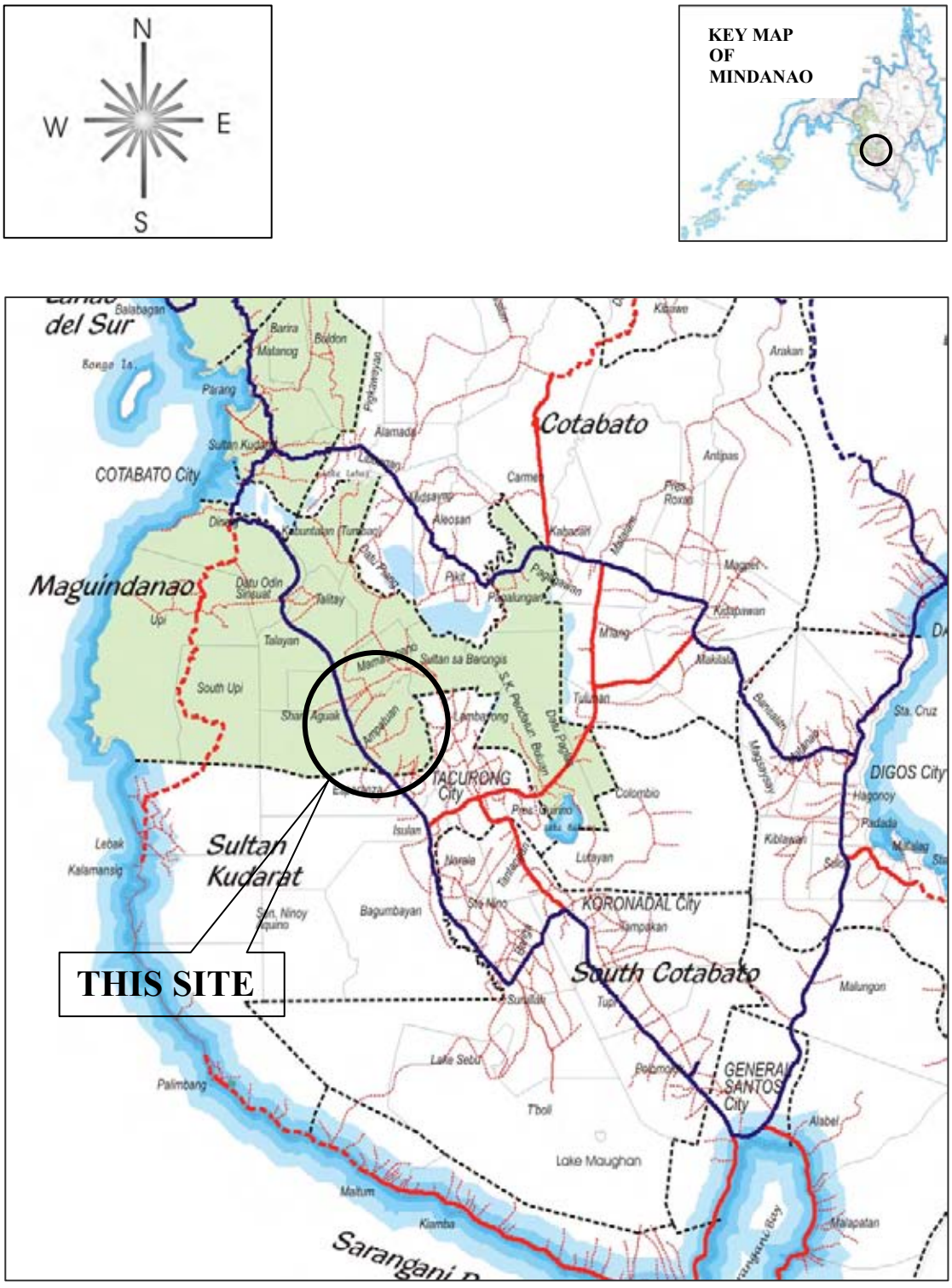
8. Attachment

Attached is the project location map, the proposed schematic layout of the Malatimon Bakery as well as captioned photographs.

VICINITY MAP



LOCATION MAP



MUNICIPALITY OF AMPATUAN, MAGUINDANAO PROVINCE

LOCATION MAP

PROPOSED LOCATION OF MALATIMON BAKERY BUILDING

APPENDIX M17-1: MAYO FARM ANIMAL LIVELIHOOD

IBNA Pre-Feasibility Study

1. Title and Location

Farm Animal Livelihood in Barangay Mayo, Municipality of Columbio, Sultan Kudarat Province

2. Present Situation and Needs

Mayo is a barangay in Columbio Municipality, Sultan Kudarat Province, located at northwest portion of the municipality. The barangay is accessible to the Poblacion by all kinds of transportation. It is composed of 8 sitios, and has a total area of 2,478 hectares. There is a regular transportation for farmers/residents to bring their produce to the market. Mayo has a population of 1,110 persons based on the 2007 National Census, of which 80% are farmers.

The barangay is plain to rolling terrain with fertile soil, suited for agriculture production. Farming is the main sources livelihood of residents in the area. Rice and corn is main production, and others are coconut, banana, sugar cane, and mangoes. Agriculture area is comprised of 234 hectares, with 122 hectares for corn, and 112 hectares for rice. Farmers can have an average of 2 cropping seasons a year of rice and corn.

Farmers experienced a low output of their harvest due to lack of farming equipment and high cost of fertilizer. The average yield is 80 sacks per hectares for rice and corn. They are still using the old method of farming such as carabao for plowing the soil. According to the farmers, there are around 70 carabaos in the barangay and only 50 are performance well.

In 2000, when the government declared all out war with the Moro Islamic Liberation Front (MILF), many people were displaced. Farm animals were sold at lower price because they afraid that their animal be killed in the cross fire.

Some does not have a carabao to cultivate their farm, obliging them to lease from other farmer, and paying back by sacks of rice upon harvest. Others are paying to plow the farm at Php 1,500 per hectare. The limited number of farm animal can delay farming activities, as such could prevent also from 3 cropping seasons per year.

The provisions of carabao would encourage farmers to work harder, and to open more lands that are not developed. After harvesting farmers can immediately harrow the soil to prepare for the next planting seasons. In terms of livelihood more crops can be planted and additional cropping season is expected to gain.

The distribution of the animal would be entirely the responsibility of the local government unit (LGU). The LGU or the Provincial Agriculture Office (PAO) would manage the dispersal of the animal, insemination program, and train farmers on how to propagate the animal as the counterpart contribution of the project.

3. Project Concept

This particular project would consist of.

- The provision of working animals in (8) sitios at barangay.

4. Benefits

The project would directly and indirectly provide economic benefit at approximately 80 households or 455 persons of the community. Economic activities of the farmer would increase, create more job opportunities, and improve basic social services in terms of income generations.

5. Potential Risks

The LGU or the Provincial Agriculture Office (PAO) should the periodically check the animal so that it remain healthy for several years. These maintenance works are the ditching of canals, crowning of roads, patching of uneven grounds especially during raining seasons when landside could occur along the road.

6. Costs Estimates

The initial estimated cost of the project is PhP 1.58 million, and broken down as follows.

Description of Items	Estimated Cost
1) Provision of 80 Carabaos (Php 18,000/head)	P 1.44 M
Total	P 1.44 M
10 % Contingency	P 0.14 M
Total Estimated Cost	**P 1.58 M**

7. Cost-benefit Analysis

The Annual Population Growth Rate of Sultan Kudarat Province is 1.97%, based on the 2007 National Census.
Growth rate (r) is 1.97%.
Number of beneficiaries is approximately 500 farmers.
Agricultural area beneficial: Assume 100 hectares.
Project Life is 10 years.

- **Cost**

Initial Cost: PhP 1.58 Million.
Operation and Maintenance:

a) Assume cost of animal health care at PhP 500/Carabao/month.
b) Number of working animal (Carabao): 80 heads.
c) Total Annual Cost: PhP 500/Carabao/month*80 Carabao*12 months = PhP 480,000/year, and increasing at 5% yearly.

Below is the computation of projected annual O&M cost:
Table 1

Year	Total Annual O&M projected at 5% $= P*(1+r)^n$ (PhP)
1	480,000
2	504,000
3	529,200
4	555,660
5	583,443
6	612,615
7	643,246
8	675,408
9	709,179
10	744,638

- **Benefits**

Animal Rental Saving:

a) Cost of animal rental: PhP 1,500/hectare, assume an increase of 5% yearly.
b) An average of 2 cropping season a year of rice and corn.

Below is the computation of projected animal rental saving:

Table 2

Year	Beneficial Area (100 ha)	Cost of Animal Rental at 5% yearly increase	Cropping per year (2)	Annual Boat Rental Savings (PhP)
1	100	1,500	2	300,000
2	100	1,575	2	309,000
3	100	1,654	2	318,270
4	100	1,736	2	327,818
5	100	1,823	2	337,653
6	100	1,914	2	347,782
7	100	2,010	2	358,216
8	100	2,111	2	368,962
9	100	2,216	2	380,031
10	100	2,327	2	391,432

Farmers Additional Income:

a) Assume that 50 hectares new land be cultivated and developed 10ha yearly.
b) One hectare of farm land can yield 80 sacks: 80 sacks/hectare.
c) Average cost/sack: 50 kgs/sack*PhP 10/kg = PhP 500/sack, assume at 5% increase yearly.

Below is the computation of projected farmer's income:

Table 3

Year	New Land Develop (50 ha)	Average Yield/Hectare (80 sacks)	Price/Sack (PhP 80)	Cycle	Annual Farmers Income (PhP)
1	10	80	500	2	800,000
2	20	80	525	2	1,680,000
3	30	80	551	2	2,646,000
4	40	80	579	2	3,704,400
5	50	80	608	2	4,862,025
6	50	80	638	2	5,105,126
7	50	80	670	2	5,360,383
8	50	80	704	2	5,628,402
9	50	80	739	2	5,909,822
10	50	80	776	2	6,205,313

- **Computation of Net Present Value, (NPV), and Internal Rate of Return (IRR)**

Assume the opportunity cost (oc) of capital cost is 10%

All values are in million pesos

Table 4

Year	Cost			Benefit			**Total Cash Flow**	**NPV TCF/ $(1+oc)^n$**
	Initial Invest-ment	O & M (Table 1)	Subtotal Cost	Animal Rental Savings (Table 2)	Annual Farmers Income (Table 3)	Subtotal Benefit		
T	1.58		1.58				-1.58	-1.58
T-1		0.48	0.48	0.11	0.80	0.91	3.82	3.47
T-2		0.50	0.50	0.11	1.68	1.79	3.85	3.18
T-3		0.53	0.53	0.12	2.65	2.76	3.87	2.91
T-4		0.56	0.56	0.12	3.70	3.83	3.89	2.66
T-5		0.58	0.58	0.13	4.86	4.99	3.92	2.43
T-6		0.61	0.61	0.13	5.11	5.24	3.94	2.22
T-7		0.64	0.64	0.14	5.36	5.50	3.96	2.03
T-8		0.68	0.68	0.15	5.63	5.78	3.98	1.86
T-9		0.71	0.71	0.16	5.91	6.06	4.00	1.70
T-10		0.74	0.74	0.16	6.21	6.37	4.02	1.55

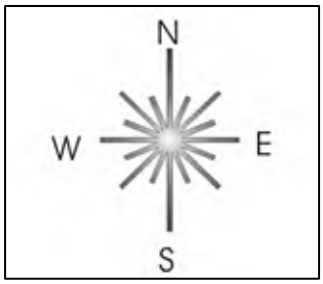
Solving for NPV, and IRR;
NPV = $\sum$Cash Flow (T-n)/ $(1+oc)^n$-T, (n=1-15)
NPV = 18.44

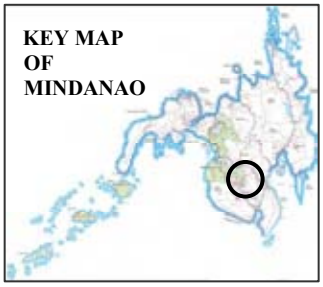
IRR = r ;where $\sum$Cash Flow (T-n)/ $(1+r)^n$-T=0, (n=1-15)
IRR = 88.7%

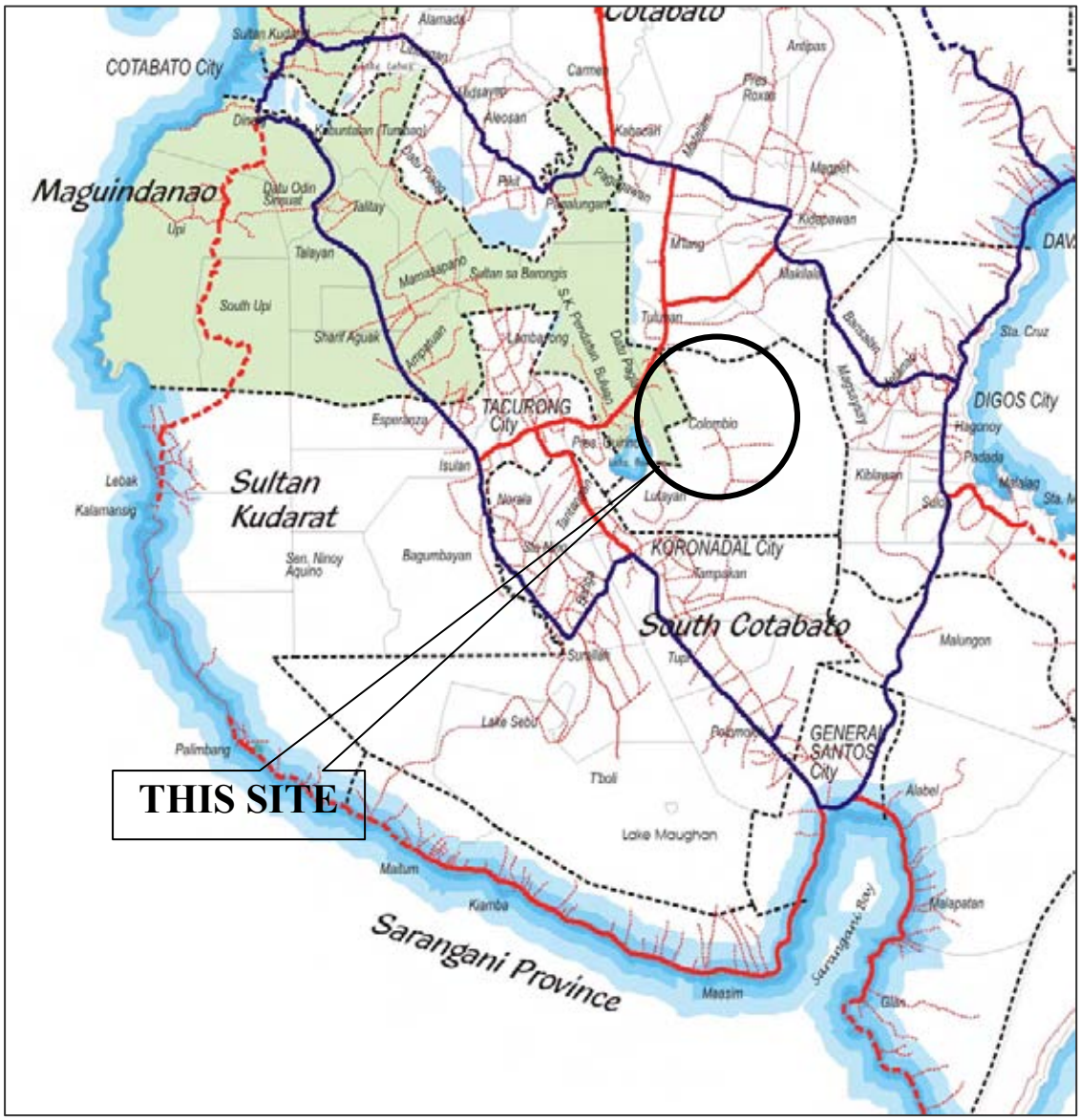
8. Attachment

Attached are the project location map, the proposed development plan as well as captioned photographs highlighting the road and its vicinity.

LOCATION MAP







MUNICIPALITY OF COLUMBIO, SULTAN KUDARAT PROVINCE

PHOTOGRAPHS

Barangay Mayo has a vast field of rice fields

Corn is the largest produced in the barangay

Carabao are flowing the field in preparation of planting activities

APPENDIX M18-1: MINDUPOK WATER SYSTEM DEVELOPMENT

IBNA Pre-Feasibility Study

1. Title and Location

Water Spring Development in Barangay Mindupok, Municipality of Maitum, Sarangani Province

2. Present Situation and Needs

The Municipality of Maitum is a 3rd class municipality in the province of Sarangani, Philippines. According to the 2007 census, it has a population of 37,054 people consisting of 19 barangays, and a land area of 324.35 km². It is bounded on the west by the province of Sultan Kudarat, on the east by the municipality of Kiamba, on the north by the province of South Cotabato, and on the south by the Celebes Sea.

The economy of Maitum is largely based on agriculture and is often called the "rice-granary" of Sarangani due to its high level production of rice. Aqua-culture is the second biggest income earner, notably the culture of milkfish (*bangus*), prawns (particularly giant prawns) and shrimps for export. Other agricultural products are coconuts, maize, sugarcane, bananas, pineapples, mangoes, eggs, beef, and fish. Maitum is also a food basket nationally famous for its dried fish.

Barangay Mindupok is one of the barangays of Maitum that situated on the East of Barangay Kalaong, North of Barangay Ticulab, West of Barangay Maguiling, and on the South is Celebes Sea. The total land area of Barangay Mindupok is 1000 hectares. It is approximately 11 kilometers away from the Poblacion, it can be reached in all kinds of land vehicles.

Barangay Mindupok has a total population of 3,051 persons, based on the 2007 National Census. Agriculture is the main livelihood of the constituents, with rice, and corn is the main produce followed by copra, and other root crops. Some of the residents especially near the shore line are engage in fishing and aqua culture.

Almost 75% of residents at Barangay Mindupok used shallow well for household needs. Presently, the residents in the area draw water for domestic consumption from shallow open wells that are often get contaminated especially during the rainy season. Some residents also utilize rain water, spring, and river. This is the perennial problems by residents in the community. Fortunately, the In-Depth Barangay Needs Analysis (IBNA), team visited the area and the community preferred the spring development including the distribution of pipelines and communal faucets are their main priority.

The development of the spring with distribution pipelines with different sizes and storage tank, and the construction of a communal faucet in the community are their priority and needs. The spring located at Sitio Malipayon approximately four kilometer from Barangay Hall that the residents would want to be developed. The spring can discharges water of approximately 4 liters per second, and it is located at 120 meters above sea level. This can serve more than 4,000 person or 800 households good as Level II system. The proposed storage tank (reservoir) will be located of approximately 2,000 meters from the source. A distribution lines from the storage tank connecting to communal faucets at different location in the area.

The construction of 25 cubic meter elevated storage tank will be located at Sitio Bantug. Once completed, the project benefits the nearby barangays and will allow some 200 cubic meters of water daily. This project aims to provide water system facilities to the residents of Barangay Mindupok and the neighboring barangays. The project will directly benefit residents and farmers who belong to the different ethnic tribes and indigenous cultural groups.

3. Project Concept

This particular subproject would consist of several components.

1. Construction of 1 unit intake box (spring box) through a gravity flow system which a capacity of 4 liters per second, connecting the water source to reservoir. The intake is made of a screened intake pipe reinforced concrete structure, and removable cover.
2. Installation of new pipelines (transmission line) from intake to the reservoir of approximately 2 kilometer of 75 mm pipe diameter;
3. Construction of 1 reinforced concrete elevated reservoir 20 cubic meter capacity (20,000 liters) to meet peak hour requirement;
4. Installation of distribution pipe system approximately 4,000 meters of various sizes ranging from 50mm diameter to 13mm diameter; and
5. Installation of 25 communal faucets (public faucet), with bath tub in different location.

4. Benefits

The project will directly benefit the 3,000 residents (500 household) of Barangay Mindupok and neighboring barangays. The facility will provide the community with safe, potable drinking water that will minimize or eliminate the occurrence of water-borne diseases such as abdominal symptoms, cholera, diarrhea, and typhoid fever. There will also be improved sanitation due to improved and continuous water supply service.

The will improve health of people and minimize the cost of hospitalization and the loss of working days due to illness caused by water-borne microorganisms. The project aims to provide the people with available and accessible sources of potable water supply resulting to time savings in fetching water. There will be also an improvement on the sanitation, hygiene and cleanliness due to continuous water service.

5. Potential Risks

The potential risk of the project is after the turn-over to the local government units (LGU) or a local authority such as Barangay Water System (BAWASA). The operation and maintenance of the project is very important; if the facility is not properly maintained, it cannot last very long. Concerns for environmental protection and management including water population control, forest watershed conservation, water conservation, sanitation, and hygiene education shall be included in the training.

6. Costs Estimates

The initial estimated cost of the project is Php 4.18 million and broken down as follows:

DESCRIPTION OF ITEM	TOTAL COST
1.) Mobilization/Demobilization	P 0.05 M
2.) Construction of one (1) Spring Box	P 0.10 M
3.) Construction of a reinforced concrete ground reservoir, 25 cubic meter (25 liters) capacity	P 0.40 M
4.) Installation of transmission pipelines approximately 2,000 m long of 75 mm diameter.	P 1.00 M
5.) Installation of distribution pipelines of various sizes of approximately 4,000 meters with fittings ranging from 75 mm diameter to 13 mm diameter	P 2.00 M
6.) Construction of 25 units communal faucets	P 0.25 M
Total	P 3.80 M
10% Contingency	P 0.38 M
Total Estimated Cost	**P 4.18 M**

7. Cost-benefit Analysis

The Annual Population Growth Rate of Sarangani Province is 2.04%, based on the 2007 National Census
Growth rate (r) is 2.04%
Number of beneficiaries is approximately 3,000 persons or 500 families
Project Life is 15 years

Solving the projected population using formula $P_j = P*(1+r)^n$; where: r = growth rate; n = no. of years
Below is the computation of projected annual population, and household:
Table 1

Year	Projected Annual Population	Number of Household (Projected/Ave HH = 6)
1	3,000	500
2	3,061	510
3	3,124	521
4	3,187	531
5	3,252	542
6	3,319	553
7	3,386	564
8	3,456	576
9	3,526	588
10	3,598	600
11	3,671	612
12	3,746	624
13	3,823	637
14	3,901	650
15	3,980	663

- **Cost**

Initial Cost: PhP 4.18 Million
Operation and Maintenance

a) Assume 2 persons are in charge of the maintenance of water system, the rate is PhP 150/person.
   Manpower Cost: PhP150/person*25 working days/month*12month = PhP 90,000 per year, an increase of 5% yearly
b) Assume material cost of PhP 5,000/month
   Annual material cost: PhP 5,000*12 = Php 60,000, an increase of 5% yearly

Below is the computation of projected annual operation and maintenance cost:
Table 2

Year	Annual Cost of Manpower (5% increase yearly)	Annual Cost of Materials (5% increase yearly)	Total Operating and Maintenance Cost (PhP)
1	90,000	60,000	150,000
2	94,500	63,000	157,500
3	99,225	66,150	165,375
4	104,186	69,458	173,644
5	109,396	72,930	182,326
6	114,865	76,577	191,442
7	120,609	80,406	201,014
8	126,639	84,426	211,065
9	132,971	88,647	221,618

Year	Annual Cost of Manpower (5% increase yearly)	Annual Cost of Materials (5% increase yearly)	Total Operating and Maintenance Cost (PhP)
10	139,620	93,080	232,699
11	146,601	97,734	244,334
12	153,931	102,620	256,551
13	161,627	107,751	269,378
14	169,708	113,139	282,847
15	178,194	118,796	296,990

- **Benefits**

Savings in Water Cost

a) Assume water consumption is 10 cu.m/year/person
b) Assume a minimum water rate of PhP 110 per 10 cu.m., an increase of 5% yearly

Below is the computation of projected annual saving in water cost:

Table 3

Year	Projected Population (Table 1)	Minimum Water Rate (5% increase yearly)	Annual Water Cost (PhP)
1	3,000	110	330,000
2	3,149	116	363,756
3	3,306	121	400,964
4	3,471	127	441,979
5	3,644	134	487,189
6	3,825	140	537,023
7	4,016	147	591,956
8	4,216	155	652,507
9	4,426	163	719,252
10	4,646	171	792,824
11	4,877	179	873,922
12	5,120	188	963,315
13	5,375	198	1,061,853
14	5,643	207	1,170,470
15	5,924	218	1,290,197

Savings in Waterborne Diseases

Water supply and sanitation-related diseases (such as diarrhea, hepatitis, cholera, typhoid (Philippines – Environment Health Country Profile – World Health Organization, March 1, 2005)

a) Assume 10% of population is reduced of water related illness.
b) Assume fare to the hospital (6 km) is PhP 40/person*2 (patient and escort) = PhP 80.
c) Assume hospitalization cost has an average of PhP 1,000 per patience.
   Total Cost: PhP 80 + PhP 1,000 = PhP 1,080, and an increase of 5% yearly

Below is the computation of projected annual saving hospitalization cost:

Table 4

Year	Projected Population (Table 1)	10% of Projected Population (Table 1)	Hospitalization Cost (5% yearly increase)	Annual Saving Hospitalization Cost (PhP)
1	3,000	300.00	1,080	324,000
2	3,149	314.94	1,134	357,142
3	3,306	330.62	1,191	393,674
4	3,471	347.09	1,250	433,943
5	3,644	364.37	1,313	478,331
6	3,825	382.52	1,378	527,259
7	4,016	401.57	1,447	581,193
8	4,216	421.57	1,520	640,643
9	4,426	442.56	1,596	706,174
10	4,646	464.60	1,675	778,409
11	4,877	487.74	1,759	858,032
12	5,120	512.03	1,847	945,801
13	5,375	537.53	1,940	1,042,546
14	5,643	564.30	2,037	1,149,189
15	5,924	592.40	2,138	1,266,739

- **Computation of Net Present Value, (NPV), and Internal Rate of Return (IRR)**

Assume the opportunity cost (oc) of capital cost is 10%
All values are in million pesos
Table 5

Year	Cost			Benefit			Total Cash Flow	NPV TCF/ $(1+oc)^n$
	Initial Investment	O & M (Table 2)	Sub-total Cost	Water Cost (Table 3)	Saving Cost on Diseases (Table 4)	Sub-total Cost		
T	4.18		4.18				-4.18	-4.18
T-1		0.15	0.15	0.33	0.32	0.65	0.50	0.46
T-2		0.16	0.16	0.36	0.36	0.72	0.56	0.47
T-3		0.17	0.17	0.40	0.39	0.79	0.63	0.47
T-4		0.17	0.17	0.44	0.43	0.88	0.70	0.48
T-5		0.18	0.18	0.49	0.48	0.97	0.78	0.49
T-6		0.19	0.19	0.54	0.53	1.06	0.87	0.49
T-7		0.20	0.20	0.59	0.58	1.17	0.97	0.50
T-8		0.21	0.21	0.65	0.64	1.29	1.08	0.50
T-9		0.22	0.22	0.72	0.71	1.43	1.20	0.51
T-10		0.23	0.23	0.79	0.78	1.57	1.34	0.52
T-11		0.24	0.24	0.87	0.86	1.73	1.49	0.52
T-12		0.26	0.26	0.96	0.95	1.91	1.65	0.53
T-13		0.27	0.27	1.06	1.04	2.10	1.84	0.53
T-14		0.28	0.28	1.17	1.15	2.32	2.04	0.54
T-15		0.30	0.30	1.29	1.27	2.56	2.26	0.54

Solving for NPV, and IRR;
NPV = $\sum$Cash Flow (T-n)/ $(1+oc)^n$-T, (n=1-15)
NPV = 3.36

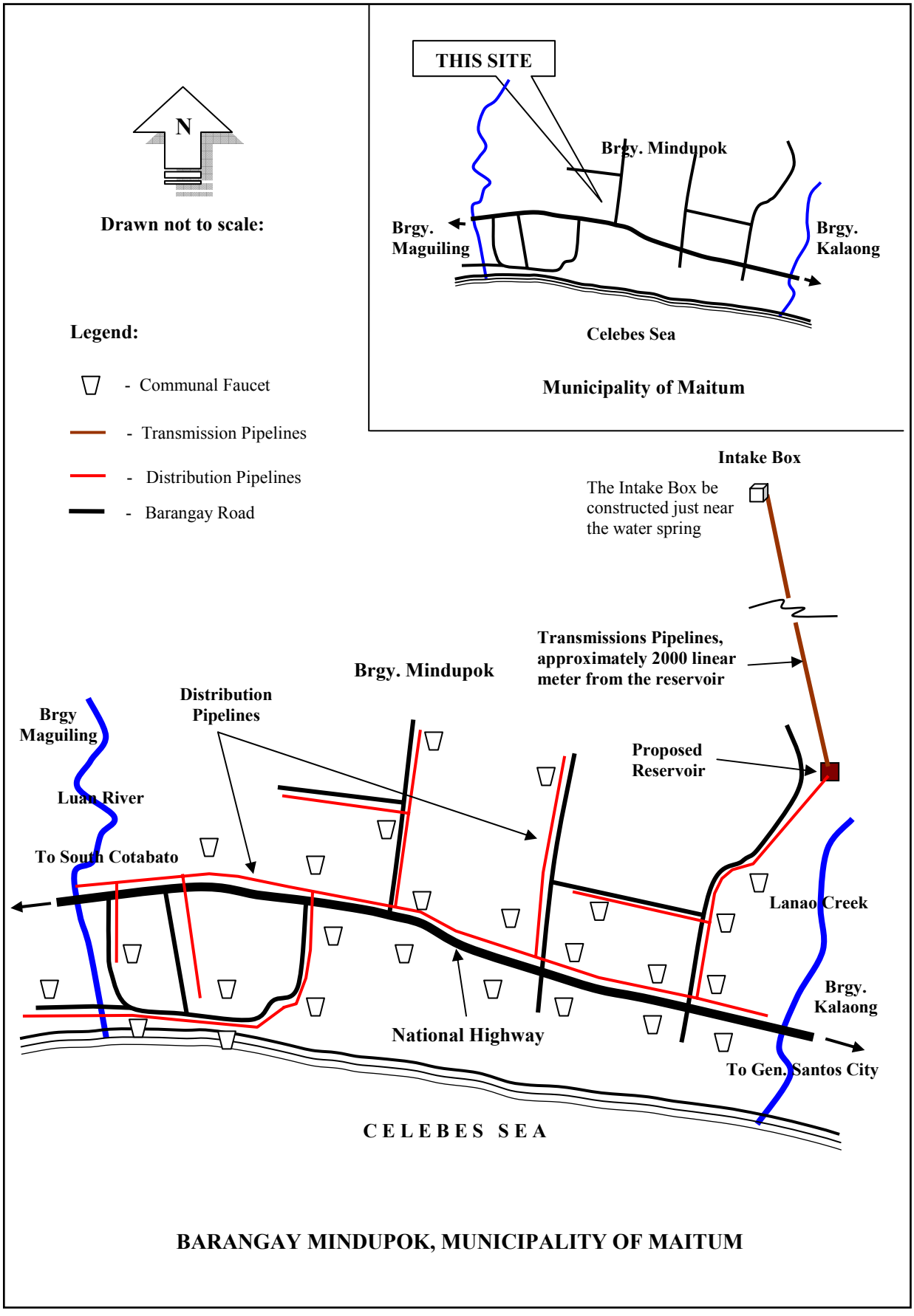
IRR = r ;where $\sum$Cash Flow (T-n)/ $(1+r)^n$-T=0, (n=1-15)

IRR = 19.0%

8. Attachment

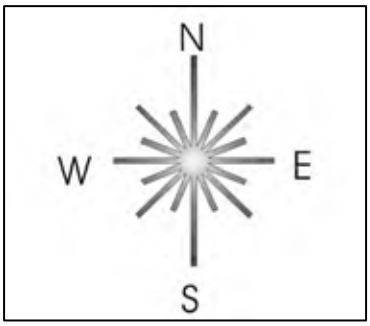
Attached is the project location map, the proposed schematic layout of the proposed Mindupok Water System Development as well as captioned photographs.

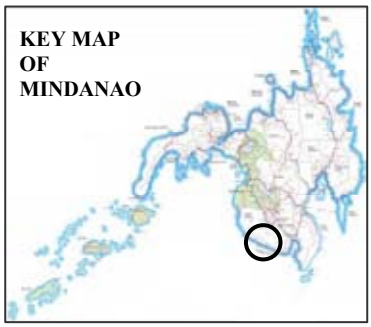
VICINITY MAP

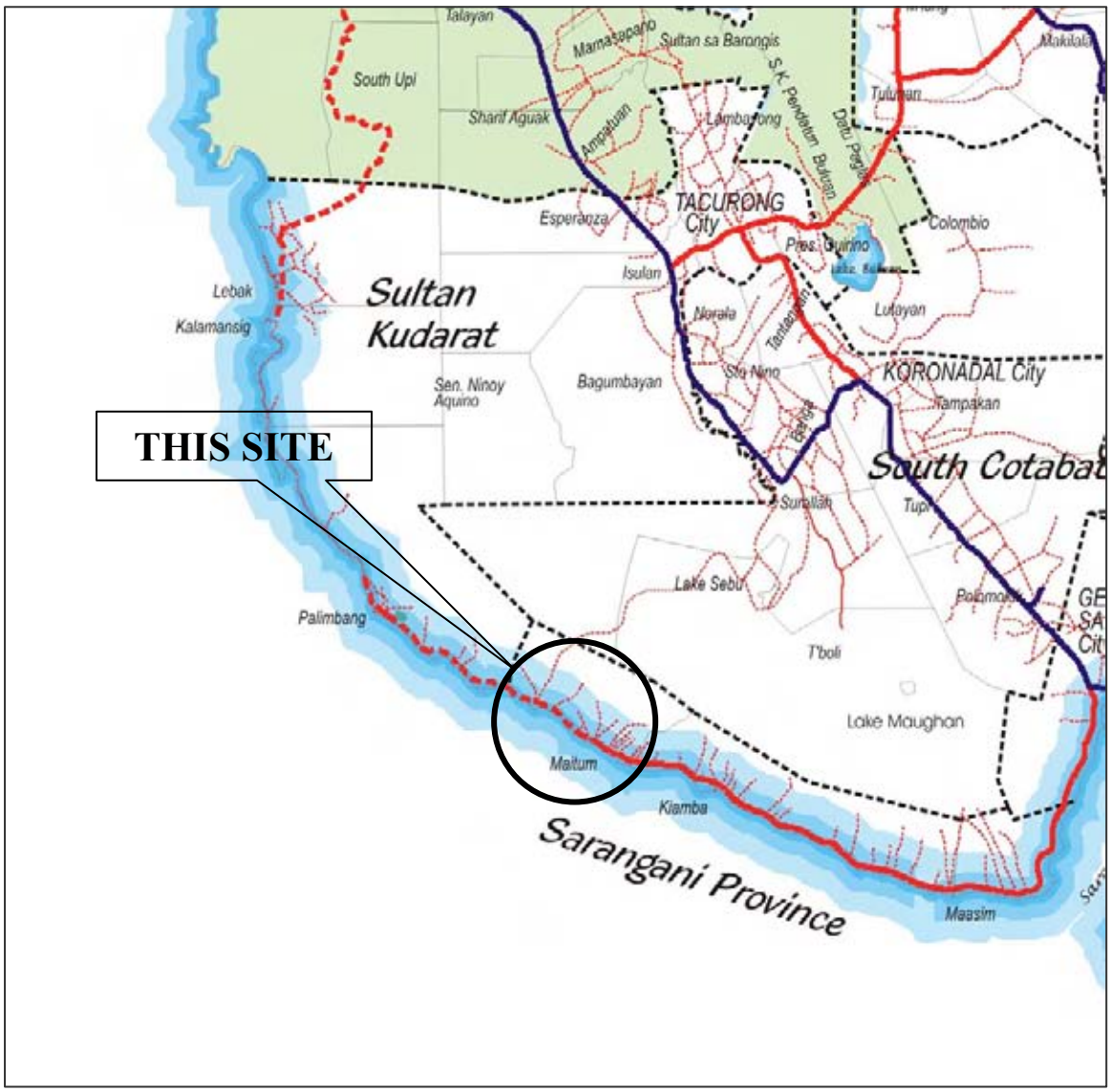


BARANGAY MINDUPOK, MUNICIPALITY OF MAITUM

LOCATION MAP







MUNICIPALITY OF MAITUM, SARANGANI PROVINCE

PHOTOGRAPHS

The Water Spring source is approximately 4000 meters from the National Highway

The proposed location of reservoir approximately 1,500 meters from the National Highway

Residents are getting water from this shallow well

A communal faucet be constructed/installed at these Sitios Bantug and Dimaguil

APPENDIX M19-1: NALUS WATER SPRING DEVELOPMENT

IBNA Pre-Feasibility Study

1. Title and Location

Water Spring Development in Barangay Nalus, Municipality of Kiamba, Sarangani Province

2. Present Situation and Needs

Kiamba is a 3rd class municipality in the province of Sarangani, Philippines. According to the 2007 National Census, it has a population of 53,040 people consisting of 19 barangays, and a land area of 418.28 km². It is bordered on the west by Maitum, on the east by Maasim, on the north by South Cotabato, and on the south by the Celebes Sea. The economy of Kiamba is largely based on agriculture with vast rice fields surrounding the municipality. Aqua-culture is the second biggest income earner, notably the culture of milkfish and shrimps (locally called "sugpo" or "lukon") for export. Also, coastal communities depend on deep-sea fishing as a primary livelihood.

Barangay Nalus is one of the barangays of Kiamba. The total land area of Nalus is 3,078.75 hectares. It is approximately5 kilometers away from the Poblacion of Kiamba. It can be reached in all kinds of land vehicles in the coastal, and through motorcycle popularly known as “habal-habal in the mountainous range. The terrain is relatively plain along the coastal areas and hilly in some areas. The urban area is 3.0 meters above sea level and gently slopping to 500 meters toward the hinterlands.

Barangay Nalus has a total population of 3,937 persons based on the 2007 National Census. Agriculture is the main livelihood of the constituents such as rice, corn, copra, banana, and abaca. The other residents especially near the shore line are engaging in fishing and aqua culture for milkfish, and shrimps.

Majority of residents have no potable water supply. Their sources of water from shallow well, pump wells which are often get contaminated especially during rainy seasons and maybe risk from water-borne disease. Others are getting water from the spring which is few kilometers from the community especially the resident near shorelines. Some are buying potable water at PhP 5.0 per container. Although there are several spring within the barangay, these are not developped.

There is an existing reservoir with a capacity of 20,000 liters at Sitio Bocay-il which was built in 2002 under the Upland Development Programme (UDP) in cooperation with the Department of Agriculture (DA). However, this can not accommodate all the residents in the barangays. The distribution pipelines did not reach the populated area, and only 10 units of communal faucet were constructed. Some of these communal faucets are now partially damaged. The distribution pipelines reached only at the National Highway of Maitum road of Sitio Masagana, of which only approximately 100 households or 470 persons benefited the project.

During In-Depth Barangay Needs Analysis (IBNA), conducted by the survey team, they preferred the spring development including the distribution of pipelines and communal faucets in all the sitios of Barangay Nalus. The spring located at Sitio Lambon approximately 5 kilometers from the National Highway. The spring can discharges water of approximately 5 liters per second, and it is located at 300 meters above sea level. This can serve more than 5,000 person Level II system. The proposed storage tank (reservoir) will be located of approximately 2,000 meters from the source. The distribution pipelines will be connected to the community communal faucets at different location in the area.

The construction of 30 cubic meter storage tank will be located at Sitio Bocay-il. The project benefits the nearby barangays and will allow some 400 cubic meters of water daily. This project aims to provide water system facilities to the residents of Barangay Nalus and the neighboring barangays. The

project will directly benefit residents and farmers who belong to the different ethnic tribes and indigenous cultural groups.

3. Project Concept

This particular subproject would consist of several components.

1. Construction of 1 unit intake box (spring box) through a gravity flow system which has a capacity of 5 liters per second, connecting the water source to reservoir. The intake is made of a screened intake pipe reinforced concrete structure, and removable cover.
2. Installation of new pipelines (transmission line) from intake to the reservoir, approximately 2 kilometer of 75 mm pipe diameter;
3. Construction of 1 reinforced concrete reservoir 30 cubic meter capacity (30,000 liters) to meet peak hour requirement;
4. Installation of distribution pipe system approximately 4,000 meters of various sizes ranging from 50mm diameter to 13mm diameter; and
5. Installation of 30 communal faucets (public faucet), with bath tub in different location.

4. Benefits

The project will directly benefit the 3,000 residents of Barangay Nalus and neighboring sitios barangays. The facility will provide the community with safe, potable drinking water that will minimize or eliminate the occurrence of water-borne diseases and improve their sanitation practices.

The project aims to provide the people with available and accessible sources of potable water supply resulting to time savings in fetching water. There will be also an improvement on the hygiene and cleanliness due to continuous water service.

5. Potential Risks

The potential risk of the project is after the turn-over to the local government units (LGU) or a local authority such as Barangay Water System (BAWASA). The operation and maintenance of the project is very important; if the facility is not properly maintained, it cannot last very long. Concerns for environmental protection and management including water population control, forest watershed conservation, water conservation, sanitation, and hygiene education shall be included in the training.

6. Costs Estimates

The initial estimated cost of the project is Php 4.00 million and broken down as follows:

DESCRIPTION OF ITEM	TOTAL COST
1.) Mobilization/Demobilization	P 0.05 M
2.) Construction of one (1) Spring Box	P 0.10 M
3.) Construction of a reinforced concrete ground reservoir, 30 cubic meter (30,000 liters) capacity	P 0.40 M
4.) Installation of transmission pipelines approximately 2,000 m long of 75 mm diameter.	P 1.00 M
5.) Installation of distribution pipelines of various sizes of approximately 4,000 meters with fittings ranging from 75 mm diameter to 13 mm diameter	P 2.00 M
6.) Construction of 30 units communal faucets	P 0.30 M
Total	P 3.55 M
10% Contingency	P 0.36 M
Total Estimated Cost	**P 3.91 M**
Round off to	**P 4.00 M**

7. Costs-benefit Analysis

The Annual Population Growth Rate of Sarangani Province is 2.04%, based on the 2007 National Census
Growth rate (r) is 2.04%
Number of beneficiaries is approximately 3,000 persons or 500 families
Project Life is 15 years

- **Cost**

Initial Cost: PhP 4.18 Million
Operation and Maintenance

a) Assume 2 persons are in charge of the maintenance of water system, the rate is PhP 150/person.
   Manpower Cost: PhP150/person*25 working days/month*12month = PhP 90,000 per year, an increase of 5% yearly
b) Assume material cost of PhP 5,000/month
   Annual material cost: PhP 5,000*12 = Php 60,000, an increase of 5% yearly

Below is the computation of projected annual operation and maintenance cost:
Table 2

Year	Annual Cost of Manpower (5% increase yearly)	Annual Cost of Materials (5% increase yearly)	Total Operating and Maintenance Cost (PhP)
1	90,000	60,000	150,000
2	94,500	63,000	157,500
3	99,225	66,150	165,375
4	104,186	69,458	173,644
5	109,396	72,930	182,326
6	114,865	76,577	191,442
7	120,609	80,406	201,014
8	126,639	84,426	211,065
9	132,971	88,647	221,618
10	139,620	93,080	232,699
11	146,601	97,734	244,334
12	153,931	102,620	256,551
13	161,627	107,751	269,378
14	169,708	113,139	282,847
15	178,194	118,796	296,990

- **Benefits**

Savings in Water Cost

a) Assume water consumption is 10 cu.m/year/person
b) Assume a minimum water rate of PhP 110 per 10 cu.m., an increase of 5% yearly

Below is the computation of projected annual saving in water cost:
Table 3

Year	Projected Population (Table 1)	Minimum Water Rate (5% increase yearly)	Annual Water Cost (PhP)
1	3,000	110	330,000
2	3,149	116	363,756
3	3,306	121	400,964
4	3,471	127	441,979
5	3,644	134	487,189
6	3,825	140	537,023

Year	Projected Population (Table 1)	Minimum Water Rate (5% increase yearly)	Annual Water Cost (PhP)
7	4,016	147	591,956
8	4,216	155	652,507
9	4,426	163	719,252
10	4,646	171	792,824
11	4,877	179	873,922
12	5,120	188	963,315
13	5,375	198	1,061,853
14	5,643	207	1,170,470
15	5,924	218	1,290,197

Savings in Waterborne Diseases

Water supply and sanitation-related diseases (such as diarrhea, hepatitis, cholera, typhoid (Philippines – Environment Health Country Profile – World Health Organization, March 1, 2005)

a) Assume 10% of population is reduced of water related illness.
b) Assume fare to the hospital (18 km) is PhP 40/person*2 (patient and escort) = PhP 80.
c) Assume hospitalization cost has an average of PhP 1,000 per patience.
   Total Cost: PhP 80 + PhP 1,000 = PhP 1,080, and an increase of 5% yearly

Below is the computation of projected annual saving hospitalization cost:

Table 4

Year	Projected Population (Table 1)	10% of Projected Population (Table 1)	Hospitalization Cost (5% yearly increase)	Annual Saving Hospitalization Cost (PhP)
1	3,000	300.00	1,080	324,000
2	3,149	314.94	1,134	357,142
3	3,306	330.62	1,191	393,674
4	3,471	347.09	1,250	433,943
5	3,644	364.37	1,313	478,331
6	3,825	382.52	1,378	527,259
7	4,016	401.57	1,447	581,193
8	4,216	421.57	1,520	640,643
9	4,426	442.56	1,596	706,174
10	4,646	464.60	1,675	778,409
11	4,877	487.74	1,759	858,032
12	5,120	512.03	1,847	945,801
13	5,375	537.53	1,940	1,042,546
14	5,643	564.30	2,037	1,149,189
15	5,924	592.40	2,138	1,266,739

- **Computation of Net Present Value, (NPV), and Internal Rate of Return (IRR)**

Assume the opportunity cost (oc) of capital cost is 10%
All values are in million pesos
Table 5

Year	Cost			Benefit			Total Cash Flow	NPV TCF/ $(1+oc)^n$
	Initial Invest-ment	O & M (Table 2)	Sub-total Cost	Water Cost (Table 3)	Saving Cost on Diseases (Table 4)	Sub-total Cost		
T	4.00		4.00				-4.00	-4.00
T-1		0.15	0.15	0.33	0.32	0.65	0.50	0.46
T-2		0.16	0.16	0.36	0.36	0.72	0.56	0.47
T-3		0.17	0.17	0.40	0.39	0.79	0.63	0.47
T-4		0.17	0.17	0.44	0.43	0.88	0.70	0.48
T-5		0.18	0.18	0.49	0.48	0.97	0.78	0.49
T-6		0.19	0.19	0.54	0.53	1.06	0.87	0.49
T-7		0.20	0.20	0.59	0.58	1.17	0.97	0.50
T-8		0.21	0.21	0.65	0.64	1.29	1.08	0.50
T-9		0.22	0.22	0.72	0.71	1.43	1.20	0.51
T-10		0.23	0.23	0.79	0.78	1.57	1.34	0.52
T-11		0.24	0.24	0.87	0.86	1.73	1.49	0.52
T-12		0.26	0.26	0.96	0.95	1.91	1.65	0.53
T-13		0.27	0.27	1.06	1.04	2.10	1.84	0.53
T-14		0.28	0.28	1.17	1.15	2.32	2.04	0.54
T-15		0.30	0.30	1.29	1.27	2.56	2.26	0.54

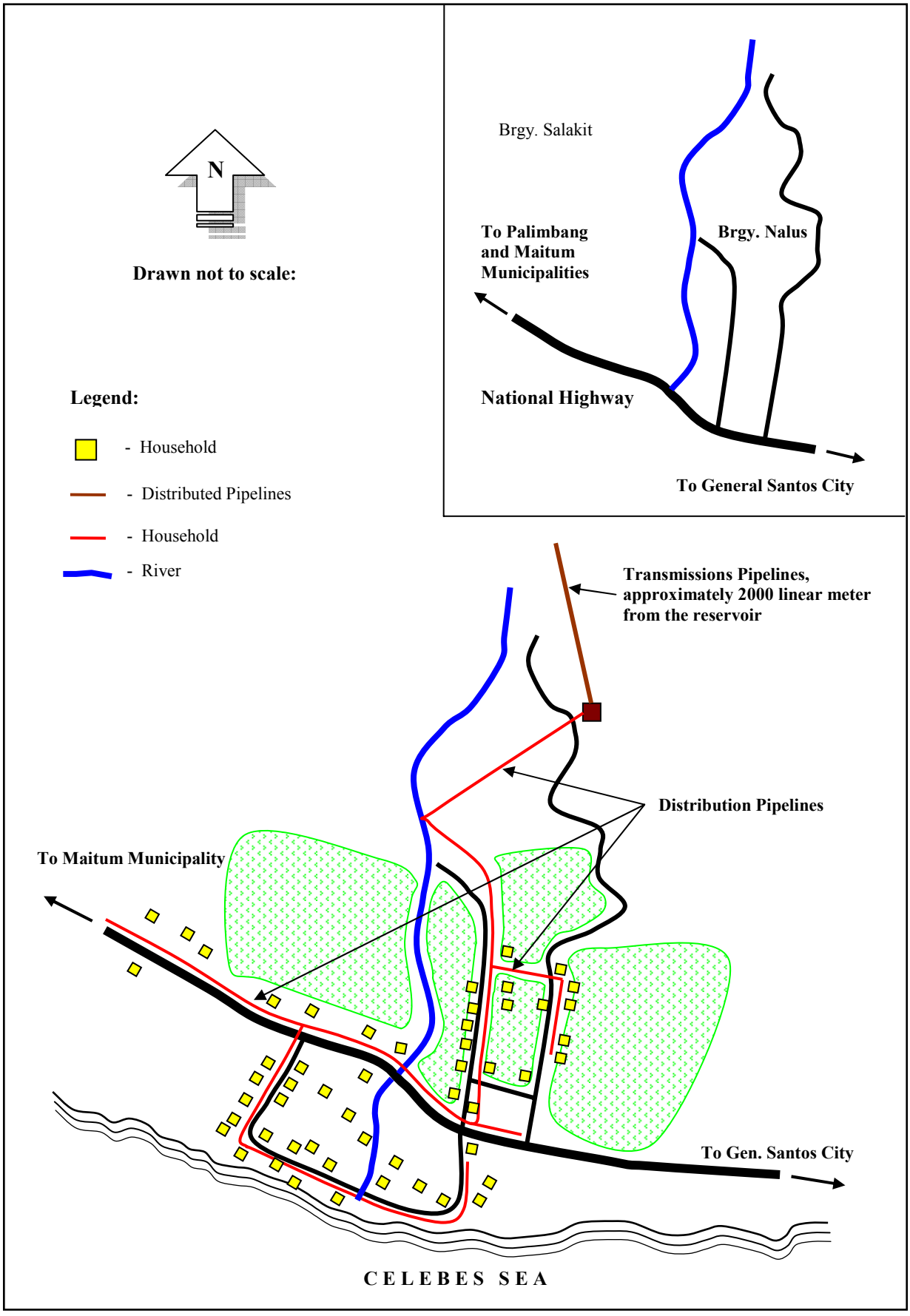
Solving for NPV, and IRR;
NPV = $\sum$Cash Flow (T-n)/ $(1+oc)^n$-T, (n=1-15)
NPV = 3.54

IRR = r ;where $\sum$Cash Flow (T-n)/ $(1+r)^n$-T=0, (n=1-15)
IRR = 19.8%

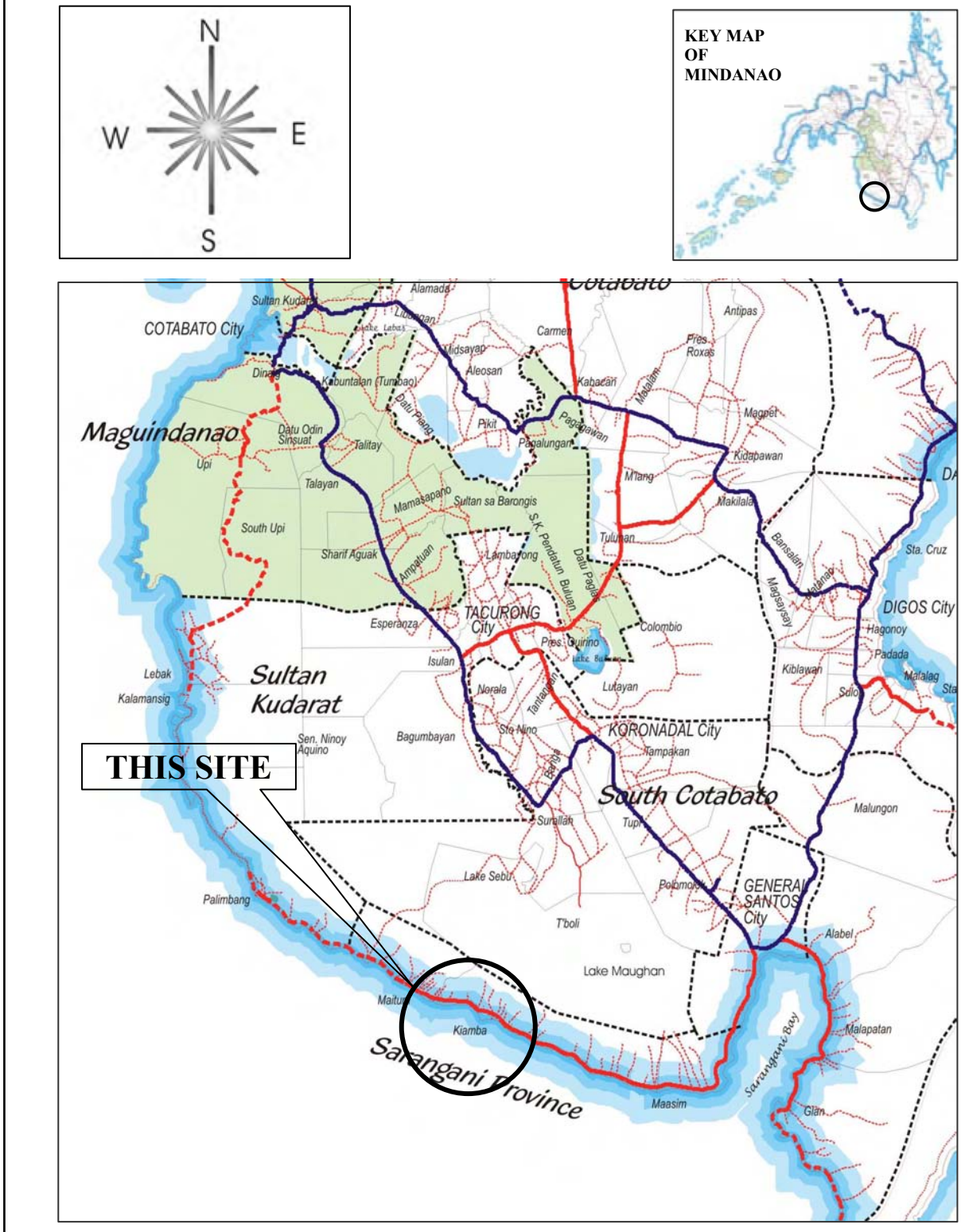
8. Attachment

Attached is the project location map, the proposed schematic layout of the proposed Mindupok Water System Development as well as captioned photographs.

VICINITY MAP



LOCATION MAP



MUNICIPALITY OF KIAMBA, SARANGANI PROVINCE

PHOTOGRAPHS

The water source approximately 2 km to the proposed reservoir

Another source of water which connect to the existing pipelines

The existing communal faucet but many are not functioning well

Some of the residents are getting water from dug well which are not safe

Along the National Highway of Kiamba, the proposed communal faucet be placed

APPENDIX M20-1: NIKAAN SPILLWAY CONSTRUCTION

IBNA Pre-Feasibility Study

1. Title and Location

Nika-an Spillway Construction in Barangay Paruayan, Municipality of Alamada, Cotabato Province

2. Present Situation and Needs

The Municipality of Alamada is a second class municipality in the province of Cotabato. According to the 2007 National Census, it has a population of 52,165 people and politically subdivided into 17 barangays. It is 102.5 kilometers from the capitol (Kidapawan City) and 74 kilometer from the Regional Center (Cotabato City) Alamada is highly elevated and characterized by rolling, hilly and undulating terrain, Its Western, eastern and central portion are highly elevated to as high as 500 to 2,815 meters above sea level.

Barangay Paruayan is one of the barangays of Alamada Municipality, it has a vast agricultural areas and fertile lands that are actively utilized for various agricultural activities. It is accessible by land vehicles but when raining season it is very difficult to access by vehicles. It has a total population of 2,460 persons based on the 2007 National Census.

Agriculture is the main livelihood of the populace which consists 90% of farming and their main production is corn. Others are coconut, rice, palm oil, banana, mangoes, and other root crops. The area planted with agricultural products constitutes approximately 1,000 hectares. There is a farm oil plantation owned by a private consortium of approximately 80 hectares, it produces a raw product of about 40 metric tons per month. The corn farming constituted the largest area planted of approximately 500 hectares, and can harvest at 3 times a year. It yields an average 100 sacks per hectares.

However, their main problem is the bringing their goods to the market due to high cost of agricultural fare rates. Sometime the road is impassable due high flood level along the Nika-an River. During raining seasons the river discharges big volume of water and farmers in the area are isolated. They have to wait for several hours for water to subside and passable again to small vehicles. There are two jeepneys (public utility vehicle) plying the area but the fares are very unreasonable due to the bad infrastructure along the way. The jeepney charges around PhP 40 to PhP 50 per sack of farm produce. Other used motorbike, or habal-haba, with chargers of fare rate of Php 50 per person and per sack of produce. There are also trucks that regularly getting the farms produce palm oil that being transported to Agusan Province.

The proposed spillway concrete bridge will be constructed perpendicular to the river on the existing road way. The spillway of 20 meters in length and 10 meters in width, with reinforced Concrete Pipe Culvert (RCPC). Approach embankments are also needed on both sides, including concrete paving of 5 meters length and a width of 6.7 meters. The construction of grouted riprap along the road approaches to protect the structure from scouring and damaging. The rehabilitation of the road approaches of approximately 50 meters. The works includes excavation to meet the standard alignment of the road, filling of sub-base, and aggregate base wearing course.

The project will become a timesaving and safety measure for all farmers who will bring their produce to the nearest trading center. The spillway will allow the safe and timely transportation of agricultural products to and from the neighboring municipalities of Libugan, and Midsayap, and to other trading center of the region.

3. Project Concept

This particular subproject would consist of several components.

1. Construction of a 20-meter long reinforced concrete spillway of 10-meter width, with Reinforce Concrete Pipe Culvert (RCPC);
2. Concreting of 5m on both sides of the spillway approaches;
3. Ripraping along both spillway approaches to prevent the spillway from scouring;
4. Rehabilitation of the road on both approaches of approximately 50 meters. The works includes embankment and base preparation, and application of aggregate wearing course, and alignment of the bridge.

4. Benefits

The project would directly and indirectly provide economic benefit at least approximately 2,000 people of the municipality of Pagayawan. Farmers will no longer experience difficulty in transporting their farm to markets in the nearest trading center in the Municipality of Libungan, and Midsayap or to other municipality. Public transportation plying the road is expected to increase and will result in time savings to commuters especially students using the newly infrastructure.

The project will directly contribute to the economic growth in the area, including an increase in the market access for agricultural products within the project influence area and facilitate the delivery of basic services. The development impact of the spillway project includes improved access, the opening of markets in the area and a reduction of transaction costs for producers, especially farmers.

5. Potential Risks

The local government unit (LGU) should facilitate in the maintaining the both the spillway and road periodically in order the project to sustain for several years. These maintenance works are the ditching of canals, clearing of debris along the sides of spillway, patching of road on uneven grounds especially during raining seasons. Also there is a possibility of landside similar to what had happened several years ago wherein a flash floods occurred damaging both property and lives of the people in the area.

6. Costs Estimates

The initial estimated cost of the project is Php 5.00 million and broken down as follows:

DESCRIPTION OF ITEM	TOTAL
1.) Construction of Spillway Bridge, including the concreting or both approaches	P 3.20 M
2.) Ripraping or grouted riprap of the approaches	P 0.40 M
3.) Rehabilitation of approximately 100 meter road approaches, includes excavation, sub-base, and base preparation, and aggregate wearing course	P 0.60 M
4.) Geotechnical investigation (lump sum)	P 0.30 M
Total	P 4.50 M
10% Contingency	P 0.50 M
Total Estimated Cost	**P 5.00 M**

7. Costs-benefit Analysis

The Annual Population Growth Rate of Cotabato Province is 2.19%, based on the 2007 National Census.
Growth rate (r) is 2.19%.
Number of beneficiaries is approximately 2,000 persons.
Project Life is 15 years.

Solving the projected population using formula $P_j = P*(1+r)^n$; where: r = growth rate; n = no. of years
Below is the computation of projected annual population:
Table 1

Year	Projected Population $= P_j*(1+r)^n$
1	2,000
2	2,044
3	2,089
4	2,134
5	2,181
6	2,229
7	2,278
8	2,327
9	2,378
10	2,431
11	2,484
12	2,538
13	2,594
14	2,651
15	2,709

- **Cost**

Initial Cost: PhP 5.0 Million.
Operation and Maintenance:

a) Assume cost of maintaining the spillway at PhP 120,000/year, including labor and equipment.
b) Assume the cost is increasing at 5% yearly.

Below is the computation of projected operation and maintenance annual cost:
Table 2

Year	Total O & M Cost Projected at 5% yearly (PhP)
1	120,000
2	126,000
3	132,300
4	138,915
5	145,861
6	153,154
7	160,811
8	168,852
9	177,295
10	186,159
11	195,467
12	205,241
13	215,503
14	226,278
15	237,592

- **Benefits**

Savings in the Passenger Transport Cost:
Using the data from Table 1, projected population

a) Assume that price reduction is PhP 10/person for transportation due to availability of more vehicles in the area.

b) Assume that the average 50 % of the residents go to the town 2 times (4 times for two ways) every month.

Annual saving of transportation cost: PhP 10*12 month*4 times= PhP 480/year, and increasing at 5% yearly.

Below is the computation of projected transport saving:

Table 3

Year	Projected Population (Table 1)	Annual Transport Saving/Person	Annual Transport Saving (PhP)
1	1,000	480	480,000
2	1,022	504	515,038
3	1,044	529	552,633
4	1,067	556	592,972
5	1,091	583	636,256
6	1,114	613	682,700
7	1,139	643	732,533
8	1,164	675	786,005
9	1,189	709	843,379
10	1,215	745	904,942
11	1,242	782	970,998
12	1,269	821	1,041,876
13	1,297	862	1,117,927
14	1,325	905	1,199,531
15	1,354	950	1,287,090

Savings in the Farm Product Transport:

Using the data from Table 1, the projected population

a) Assume the total production is 50 kg/sack*100 sacks/ha*500 hectare=2,500,000kg and 50% of the products are transported; 1,250,000kg
b) Assume that PhP 0.25/kg of farm product transport cost is reduced as the result of the improvement, and increasing at 5% yearly.
c) 3 cropping cycle yearly.

Below is the computation of projected farm product transport cost savings:

Table 4

Year	Transported Farm Product (Kg)	Cropping Cycle	Transport Cost Saving/kg (PhP)	Total Annual Transport Saving Cost (PhP)
1	1,250,000	3	0.25	937,500
2	1,250,000	3	0.26	984,375
3	1,250,000	3	0.28	1,033,594
4	1,250,000	3	0.29	1,085,273
5	1,250,000	3	0.30	1,139,537
6	1,250,000	3	0.32	1,196,514
7	1,250,000	3	0.34	1,256,340
8	1,250,000	3	0.35	1,319,157
9	1,250,000	3	0.37	1,385,114
10	1,250,000	3	0.39	1,454,370
11	1,250,000	3	0.41	1,527,089
12	1,250,000	3	0.43	1,603,443
13	1,250,000	3	0.45	1,683,615
14	1,250,000	3	0.47	1,767,796
15	1,250,000	3	0.49	1,856,186

- **Computation of Net Present Value, (NPV), and Internal Rate of Return (IRR)**

Assume the opportunity cost (oc) of capital cost is 10%
All values are in million pesos
Table 5

Year	Cost			Benefit			**Total Cash Flow**	**NPV TCF/ $(1+oc)^n$**
	Initial Invest-ment	O&M (Table 2) (PhP)	Subtotal Cost (PhP)	Annual Transport Saving (Table 3)	Farm Product Transport Saving (Table 4)	Subtotal Benefit (PhP)		
T	5.00		5.00				-5.00	-5.00
T-1		0.12	0.12	0.48	0.94	1.42	1.30	1.18
T-2		0.13	0.13	0.52	0.98	1.50	1.37	1.14
T-3		0.13	0.13	0.55	1.03	1.59	1.45	1.09
T-4		0.14	0.14	0.59	1.09	1.68	1.54	1.05
T-5		0.15	0.15	0.64	1.14	1.78	1.63	1.01
T-6		0.15	0.15	0.68	1.20	1.88	1.73	0.97
T-7		0.16	0.16	0.73	1.26	1.99	1.83	0.94
T-8		0.17	0.17	0.79	1.32	2.11	1.94	0.90
T-9		0.18	0.18	0.84	1.39	2.23	2.05	0.87
T-10		0.19	0.19	0.90	1.45	2.36	2.17	0.84
T-11		0.20	0.20	0.97	1.53	2.50	2.30	0.81
T-12		0.21	0.21	1.04	1.60	2.65	2.44	0.78
T-13		0.22	0.22	1.12	1.68	2.80	2.59	0.75
T-14		0.23	0.23	1.20	1.77	2.97	2.74	0.72
T-15		0.24	0.24	1.29	1.86	3.14	2.91	0.70

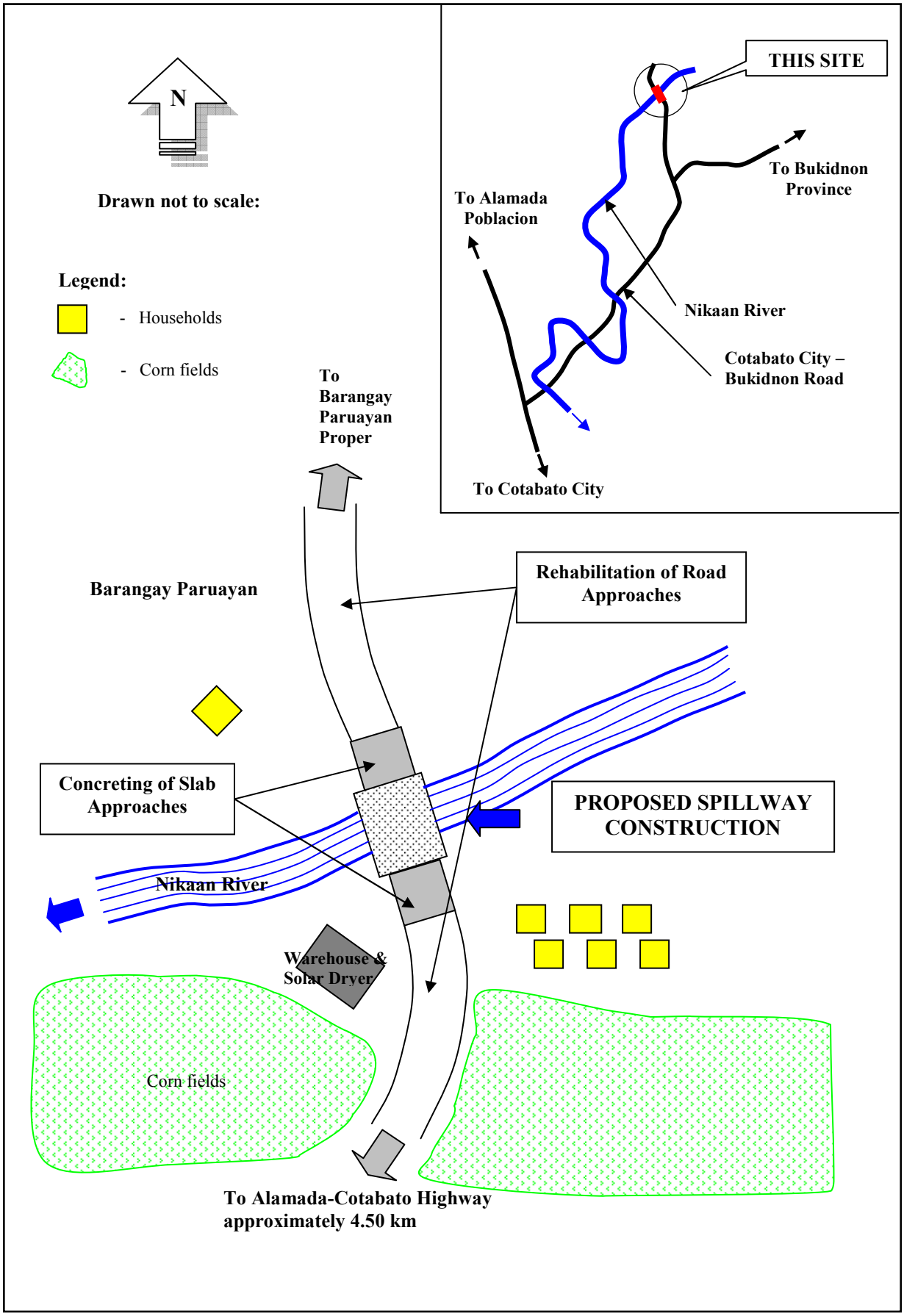
Solving for NPV, and IRR;
NPV = $\sum$Cash Flow (T-n)/ $(1+oc)^n$-T, (n=1-15)
NPV = 8.74

IRR = r ;where $\sum$Cash Flow (T-n)/ $(1+r)^n$-T=0, (n=1-15)
IRR = 30.7%

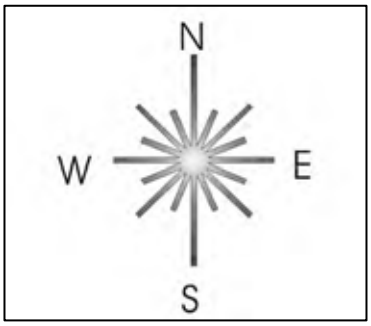
8. Attachment

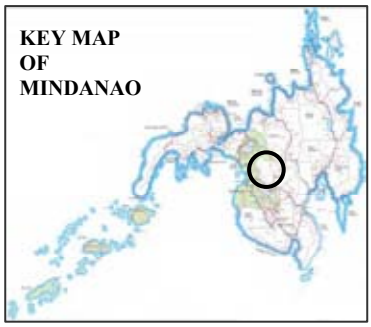
Attached is the project location map, the proposed schematic layout of the proposed Nika-an Spillway Construction as well as captioned photographs.

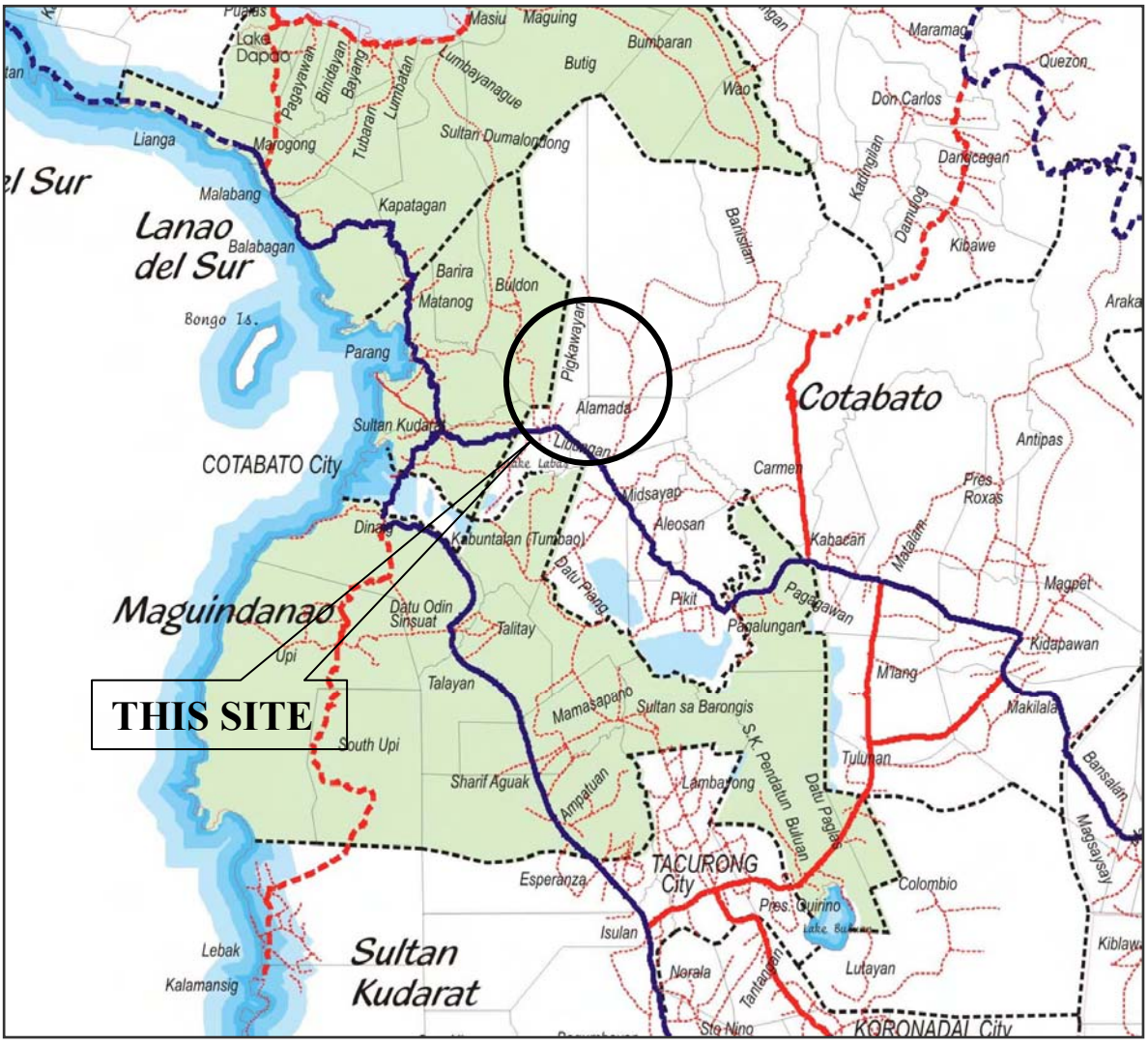
VICINITY MAP



LOCATION MAP







MUNICIPALITY OF ALAMADA, COTABATO PROVINCE

PHOTOGRAPHS

The site of the Proposed Spillway Construction along the Nika-an River

The existing road to be rehabilitated part of the bridge approaches

The vehicle was trapped because of road bad condition

Famers are using animals to haul their produce because of limited transportation

Corn produce by farmers ready for delivery to the market

APPENDIX M21-1: PAGANGAN FARM EQUIPMENT

IBNA Pre-Feasibility Study

1. Title and Location

Farm Equipment in Barangay Pagangan, Municipality of Aleosan, North Cotabato Province

2. Present Situation and Needs

The Municipality of Aleosan, classified as 4th class municipality, consists of 19 barangays with a population of 32,874 people based on the 2007 National Census. It has a total land area of 24,450 hectares. The economy of Municipality of Aleosan is intensive on rice and corn production because of its vast land area for agriculture which is comprises of 15,450 hectares or 63.19 % of the total land area. The municipality of Aleosan has marked landscape of flat terrain, rolling lands, scattered small hills and plateaus.

Barangay Pagangan is one of the barangays of Aleosan, Province of North Cotabato. According to the 2007 National Census, it has a population of 2,806 people. The total land area is 1,068 hectares; it is approximately 3 kilometers away from Aleosan Municipal Hall. It is accessible to land transportation from Cotabato City traversing the municipalities of Maguinadanao up to Davao City, as it is strategically located alongside the national highway which major transport route linking the provinces of Maguindanao, Cotabato and Davao del Sur.

Agriculture is the main livelihood of the constituents with corn, and rice is the main produce followed by copra, banana, abaca, and other root crops. The other livelihoods by the residents are livestock raising like, goat, chicken and duck. Its biggest produce is corn followed by rice and other agricultural products. The production area cultivated covers a total more or less of 500 hectares of rice and corn. Farmers have an average yield of 4 tons for rice and corn per harvest per hectare and can generate 2 to 3 cropping cycles both rice and corn in a year. Majority of the residents which accounts for 80% of population are depended on agriculture as their livelihood.

The growth in agricultural production is hindered by lack of farms facilities to cultivate the fields. To prepare the land for planting, farmers have to rent tractors from the municipal government and some privately owned individuals. The carabao is one of the most important animals in the country, especially in agriculture. The old method of farming is still used in the locality. In agriculture, a harrow is an implement for cultivating the surface of the soil. In this way it is distinct in its effect from the plough, which is used for deeper cultivation.

In 2000, when the government declared an all out war against the Moro Islamic Liberation Front (MILF), Barangay Pagangan was greatly affected. Many residents were fleeing their homes. Some were forced to sell their animals at lower prices. Until this time, majority of the farmers do not have their own carabaos to plow the farms. Again in 2003, the Barangay Pagangan was annoyed on similar incident this time during the military operation at Buliok Complex, Pikit, North Cotabato Province.

One of their priorities during the In-depth Barangay Needs Analysis (IBNA) is farming equipment such as farm tractor for the whole barangay. There is one tractor in the municipality which farmers are leasing for 19 barangays, but it is always delay due to numerous of farmers are using it. Farmers have to schedule the renting of tractor in advance at least one month. The cost of the leasing of tractor is Php 1,500 with an advance payment of 50 % for the one hectare farm lot.

The farm tractor is used for the harrowing of soil. The most common use of the term is for the vehicles used on farms. The farm tractor is used for pulling or pushing agricultural machinery or trailers, for plowing, tilling, disking, harrowing, planting, and other agricultural tasks. Harrowing is often carried out on fields to follow the rough finish left by clearing operations. The purpose of this

harrowing is generally to break up clods and lumps of soil and to provide a finer finish, it also be used to remove weeds and to cover seed after sowing.

The farm tractor including its accessories (harrowing disk) will allow farmers to have an access by means of leasing the farm equipment. In that means they will no longer wait for the availability of municipal tractor which is very sporadic schedule since all of the barangays are using the equipment. The harrowing of farm tractor can take only an hour for one hectare, but using an animal like carabao can take at least 3 days. This can have a time savings for farmers and they can plant the seeds immediately.

3. Project Concept

Purchasing of 1 unit farm tractor with complete facilities like harrowing disks or any other commonly use harrowing equipment.

4. Benefits

The directly beneficiary of farm tractor equipment is approximately 2,000 people and it will expect to increase in the years to come. The farm equipment will provide the farmers the best opportunity for higher incomes and improve their yields and lower the cost of farm production by means of faster sowing preparation. It will help farmer's valuable time and money which maximizes the three cropping per year. Additional cropping per year would gives farmers an extra income of Php 50,000 per hectare.

5. Potential Risks

There will be no potential risk pertaining to the project, if any, only the operation and maintenance after the project is turn-over to the local government units (LGU) or farmers association in the community.

6. Costs Estimates

The initial estimated cost of the project is Php 1.76 million and broken down as follows:

WORK DESCRIPTION	Total Cost
Purchasing of one (1) unit farm tractor with complete accessories like harrowing disks or any other commonly use harrowing equipment	PhP 1.60 M
Total	PhP 1.60 M
10% Contingency	PhP 0.16 M
Total Estimated Cost	**PhP 1.76 M**

7. Costs-benefit Analysis

The Annual Population Growth Rate of North Cotabato Province is 2.19%, based on the 2007 Census.
Growth rate (r) is 2.19%.
Numbers of beneficiaries are approximately 2,000 farmers more or less.
Assume 2/3 of the total area, 500 hectares, will be benefited by the project: 330 hectares.
Project Life is 10 years.

- Cost

Initial Cost: PhP 1.76 Million
Operation and Maintenance

a) Assume cost of maintaining the farm tractor at PhP 5,000/month including labor cost.
Total Annual Cost: PhP 5,000*12 = PhP 60,000, and increasing at 5% yearly.

Below is the computation of projected annual operation and maintenance cost:

Table 1

Year	Total O & M projected at 10% yearly = $P*(1+r)^n$ (PhP)
1	60,000
2	63,000
3	66,150
4	69,458
5	72,930
6	76,577
7	80,406
8	84,426
9	88,647
10	93,080

- Benefits

Rental of Farm Tractor Saving

a) Assume the area benefitted by the equipment is 330ha, or 2/3 of the total firm land.
b) The cost of renting the equipment is PhP 1,500 and increasing at 5% yearly.
c) 2 cropping cycle per year.

Below is the computation of projected annual rental of equipment:

Table 2

Year	Area Benefited (330 has)	Cycle 2 seasons	Rental of Equipment (PhP)	Annual Equipment Cost Saving (PhP)
1	330	2	1,500.00	693,000
2	330	2	1,575.00	727,650
3	330	2	1,653.75	764,033
4	330	2	1,736.44	802,234
5	330	2	1,823.26	842,346
6	330	2	1,914.42	884,463
7	330	2	2,010.14	928,686
8	330	2	2,110.65	975,121
9	330	2	2,216.18	1,023,877
10	330	2	2,326.99	1,075,070

Computation of Net Present Value, (NPV), and Internal Rate of Return (IRR)

Assume the opportunity cost (oc) of capital cost is 10%

All values are in million pesos

Table 3

Year	Cost			Benefit		Total Cash Flow	NPV TCF/ $(1+oc)^n$
	Initial Invest-ment	O&M (Table 1) (PhP)	Subtotal Cost (PhP)	Equip-ment Rental Saving Cost (Table 2)	Subtotal Benefit (PhP)		
T	1.76		1.76			-1.76	-1.76
T-1		0.06	0.06	0.69	0.69	0.63	0.58
T-2		0.06	0.06	0.73	0.73	0.66	0.55
T-3		0.07	0.07	0.76	0.76	0.70	0.52
T-4		0.07	0.07	0.80	0.80	0.73	0.50
T-5		0.07	0.07	0.84	0.84	0.77	0.48
T-6		0.08	0.08	0.88	0.88	0.81	0.46
T-7		0.08	0.08	0.93	0.93	0.85	0.44
T-8		0.08	0.08	0.98	0.98	0.89	0.42
T-9		0.09	0.09	1.02	1.02	0.94	0.40
T-10		0.09	0.09	1.08	1.08	0.98	0.38

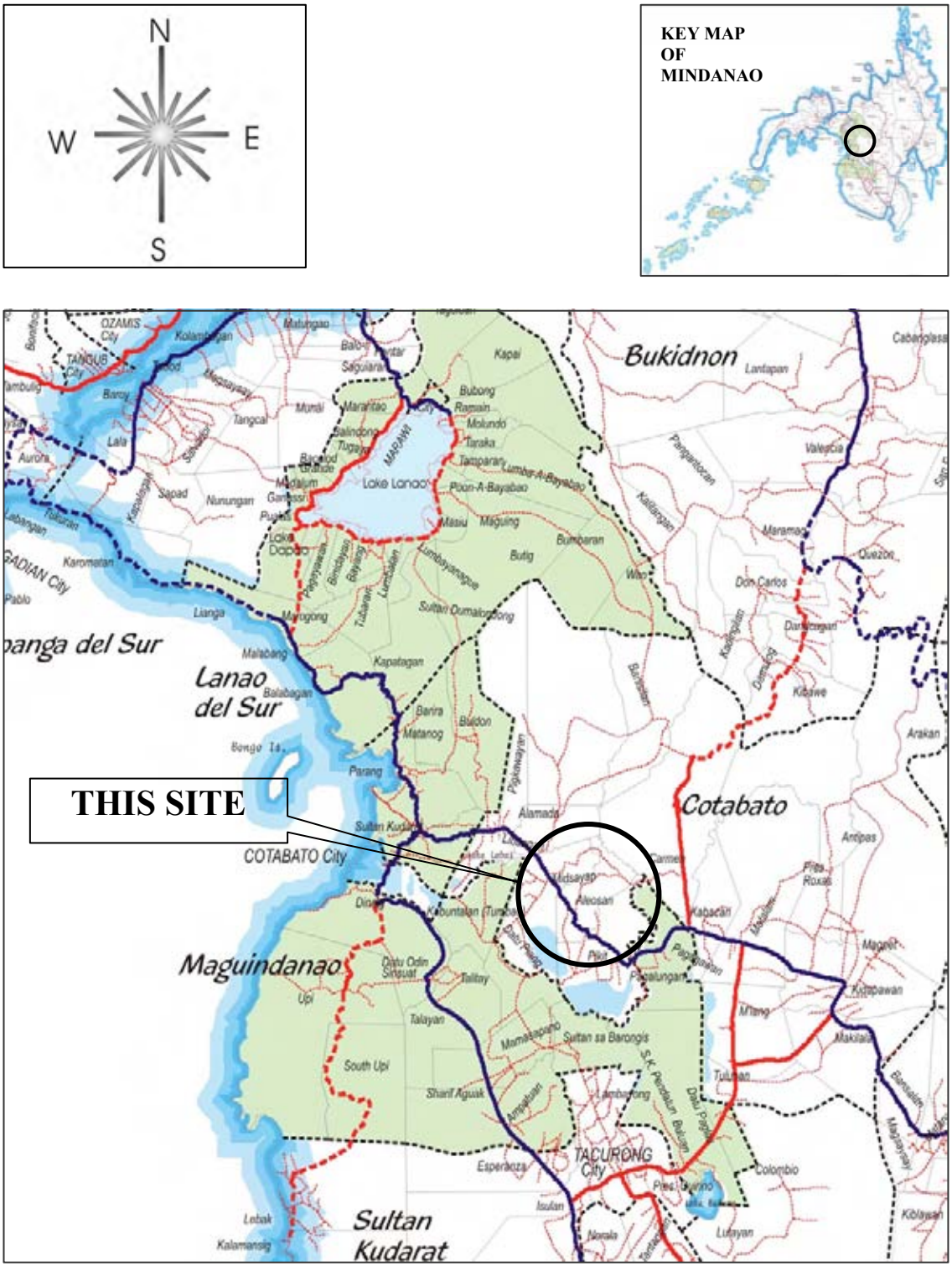
Solving for NPV, and IRR;
NPV = $\sum$Cash Flow (T-n)/ $(1+oc)^n$-T, (n=1-15)
NPV = 2.95

IRR = r ;where $\sum$Cash Flow (T-n)/ $(1+r)^n$-T=0, (n=1-15)
IRR = 38.8%

8. Attachment

Attached is the project location map, the proposed Kayaga Farm Equipment as well as captioned photographs.

LOCATION MAP



MUNICIPALITY OF ALEOSAN, NORTH COTABATO PROVINCE

PHOTOGRAPHS

Barangay Pagangan has a vast field of corn land

This is the type of farm equipment (tractor) with harrowing disk working on the fields

APPENDIX M22-1: PALIAN MADRASAH BUILDING CONSTRUCTION

IBNA Pre-Feasibility Study

1. Title and Location

Madrasah Building Construction in Barangay Palian, Municipality of Tupi, South Cotabato Province

2. Present Situation and Needs

The Municipality of Tupi, classified as 2nd class municipality, consists of 15 barangays with a population of 57,779 people based on the 2007 National Census. The municipality is predominantly an agricultural community, majority of its population derive its income from agricultural production. Around 75% of its people, particularly those in the rural barangays are agricultural workers. Tupi considered as the fruit basket of South Cotabato, with its vast agricultural lands. It is just 45 kilometers away to General Santos City, the regional trading center.

Barangay Palian is one of the barangays of Tupi, has a total land area of 775 hectares, comprising 13 puroks, and has a population of 2,509 persons based on the 2007 National Survey. Agricultural industry is the major source of living by the community residents, others are engaging in livestock raising such as cow, goat, and chicken. It is situated along the Cotabato – General Santos National Highway, an approximately 7 kilometers away to the municipal hall (Poblacion). It can be accessed by all kinds of land vehicles.

In terms of infrastructure development, barangay lacking facilities especially on day care building and madrasah for the children. During the IBNA, the residents in the area prioritized the construction of 2 Madrasah School located at Purok I, and the other at Purok Sultan Village. There is existing madrasah building having 2 classrooms at Purok I, located approximately 1 kilometer from Barangay Hall having 2 classrooms.

However, the building is small and inconvenient to the children to learn. There are 75 pupils currently enrolled. The one classroom is used by kindergarten composed of 30 pupils, and the other shared by Grade I, and II, a total of 45 pupils. They are requesting another 1 unit building with 4 classrooms for addition section intended on Grade III to Grade IX. The proposed building is located adjacent to the existing one.

The other location of madrasah is approximately 2 kilometers from barangay hall at Purok Sultan Village. The pupils in this place are attending their madrasah classes at Sitio Dahal approximately 2.0 kilometer. They are attending their classes at a wooden bamboo hut and very uneasy for pupils. There are total 30 pupils enrolled composed of Grade I, and kindergarden pupils. There are 2 teachers teaching at Sitio Dahal.

In the on-going GRP-MILF Peace Process, Madrasah education is a critical agendum. The Republic Act 9054 or Expanded Organic Act explicitly mentions that the regional education system deemed a subsystem of the national education system. A provision makes Arabic language an auxiliary medium of instruction and shall be taught as a subject in all grade levels.

3. Project Concept

This particular subproject would consist of several components.

1. Construction of two (2) unit buildings, with six (6) unit's classroom measure 5 m x 6 m;
2. Provision of tables, chairs, blackboard, and other school paraphernalia;
3. Construction of one (1) unit latrine, for boys, and girls; and
4. Construction of water hand pump intended for the latrine and for sanitary purposes.

4. Benefits

The numbers of persons who will directly benefit from the construction of Madrasah are all Muslim in the barangay. The project will bring together the best of public school and the Madrasah system prepare for Muslim children which makes them spiritually strong, making them productive Muslims.

This requires understanding with the situation, providing additional perspective to long-standing issues and the interaction with them about building a space, an atmosphere and the opportunity for collaboration in catalyzing improvements in Muslim education sector. The education department, local government, and other agencies to work to generate the support of these secondary stakeholders require efforts with the national policy. This must be supported by the government lined agencies.

5. Potential Risks

The risk is after the madrasah school building is turn-over to the administration, but it is only due to maintenance and administration of the project.

6. Costs Estimates

The initial estimated cost of the project is Php 2.48 million and broken down as follows:

WORK DESCRIPTION	Total Cost
1. Construction of two (2) units Madrasah Building, at Php 0.90 M per building	PhP 1.80 M
2. Construction of two (2) units Rest Room for boys and girls, at Php 0.10 M per facilities	PhP 0.20 M
3. Construction of two (2) units hand pumps, at Php 0.50 M per unit	PhP 0.10 M
4. Provision of amenities (chair, table, blackboard, text book, etc.)	PhP 0.15 M
Total	PhP 2.25 M
10% Contingency	PhP 0.23 M
Total Estimated Cost	**PhP 2.48 M**

7. Cost-benefit Analysis

The Annual Population Growth Rate of South Cotabato Province is 1.46%, based on the 2007 Census.
Growth rate (r) is 1.46%.
Numbers of beneficiaries are 75 pupils.
Project Life is 15 years

Solving the projected population using formula $P_j = P*(1+r)^n$; where: r = growth rate; n = no. of years
Below is the computation of projected annual student population
Table 1

Year	Projected Student, at rate of 1.46% $= P*(1+r)^n$
1	75
2	76
3	77
4	78
5	79
6	81
7	82
8	83
9	84
10	85
11	87

Year	Projected Student, at rate of 1.46% $= P*(1+r)^n$
12	88
13	89
14	91
15	92

- **Cost**

Initial Cost: PhP 2.48 Million

Operation and Maintenance

a) Assume cost of maintaining the building at PhP 30,000 per year, and cost of labor is 40%:
   Material Cost = PhP 30,000; Labor Cost = PhP 30,000*0.40 = PhP 12,000
   Total Cost = PhP 42,000; Assume increasing at the rate of 5% yearly

Below is the computation of projected annual operation and maintenance cost

Table 2

Year	Total O&M projected at 5% per annum $= P*(1+r)^n$ (PhP)
1	42,000
2	44,100
3	46,305
4	48,620
5	51,051
6	53,604
7	56,284
8	59,098
9	62,053
10	65,156
11	68,414
12	71,834
13	75,426
14	79,197
15	83,157

- **Benefits**

Savings in the Transportation Cost:

Using the data from Table 1, projected student population

a) Assume 20% of students can reduce their transportation fee.
b) Assume that PhP 20 is saved for transportation of pupils in 10 months at average of 20 days/month.
c) Annual transportation cost is PhP 20*10 months*20 days/month = PhP 4,000, and increase at the rate of 5% yearly:

Below is the computation of projected annual transportation cost savings:

Table 3

Year	20% of Projected Population Pupil, (Table 1)	Annual Transport Cost per Pupil	Total Annual Transport Cost Saving (PhP)
1	15	4,000	60,000
2	15	4,200	63,920
3	15	4,410	68,096
4	16	4,631	72,544
5	16	4,862	77,284
6	16	5,105	82,333
7	16	5,360	87,711
8	17	5,628	93,442
9	17	5,910	99,546
10	17	6,205	106,050
11	17	6,516	112,978
12	18	6,841	120,359
13	18	7,183	128,222
14	18	7,543	136,598
15	18	7,920	145,522

Increases Productivity and Earnings:
Research has established that every year of schooling increases individual wages for both men and women by a world average of about 10 percent. In poor countries, In poor countries, the gains are even greater. (Source: web.worldbank.org)
Using the data, from Table 1, projected student population

a) Assume that the minimum wage of North Cotabato Province is PhP 200/day; working day is 25days/month.
b) Annual Wage is PhP 200*25 days*12month = PhP 60,000, and increase at the rate of 5% yearly.
c) Assume that 10% of student can increase their wage in the future.
d) Children start working the 11th year of the project.

Below is the computation of projected productivity and earnings:
Table 4

Year	10% of Projected Population (Table 1)	10% of Annual Wage Projected, at 5% yearly	Annual Wage Projected
1	0	6,000.00	0
2	0	6,300.00	0
3	0	6,615.00	0
4	0	6,945.75	0
5	0	7,293.04	0
6	0	7,657.69	0
7	0	8,040.57	0
8	0	8,442.60	0
9	0	8,864.73	0
10	0	9,307.97	0
11	15	9,773.37	146,601
12	15	10,262.04	156,178
13	15	10,775.14	166,381
14	16	11,313.89	177,251
15	16	11,879.59	188,830

- **Computation of Net Present Value, (NPV), and Internal Rate of Return (IRR)**

Assume the opportunity cost (oc) of capital cost is 10%.
All values are in million pesos.
Table 5

Year	Cost			Benefit			Total Cash Flow	NPV TCF/ $(1+oc)^n$
	Initial Invest-ment	O&M (Table 1) (PhP)	Subtotal Cost (PhP)	Annual Transport Saving Cost (Table 3)	Increases Productivity and Earning (Table 4)	Subtotal Benefit (PhP)		
T	2.48		2.48				-2.48	-2.48
T-1		0.06	0.00	0.06	0.00	0.06	0.02	0.02
T-2		0.06	0.00	0.06	0.00	0.06	0.02	0.02
T-3		0.07	0.00	0.07	0.00	0.07	0.02	0.02
T-4		0.07	0.00	0.07	0.00	0.07	0.02	0.02
T-5		0.08	0.00	0.08	0.00	0.08	0.03	0.02
T-6		0.08	0.00	0.08	0.00	0.08	0.03	0.02
T-7		0.09	0.00	0.09	0.00	0.09	0.03	0.02
T-8		0.09	0.00	0.09	0.00	0.09	0.03	0.02
T-9		0.10	0.00	0.10	0.00	0.10	0.04	0.02
T-10		0.11	0.00	0.11	0.00	0.11	0.04	0.02
T-11		0.11	0.15	0.11	0.15	0.26	0.19	0.07
T-12		0.12	0.16	0.12	0.16	0.28	0.20	0.07
T-13		0.13	0.17	0.13	0.17	0.29	0.22	0.06
T-14		0.14	0.18	0.14	0.18	0.31	0.23	0.06
T-15		0.15	0.19	0.15	0.19	0.33	0.25	0.06

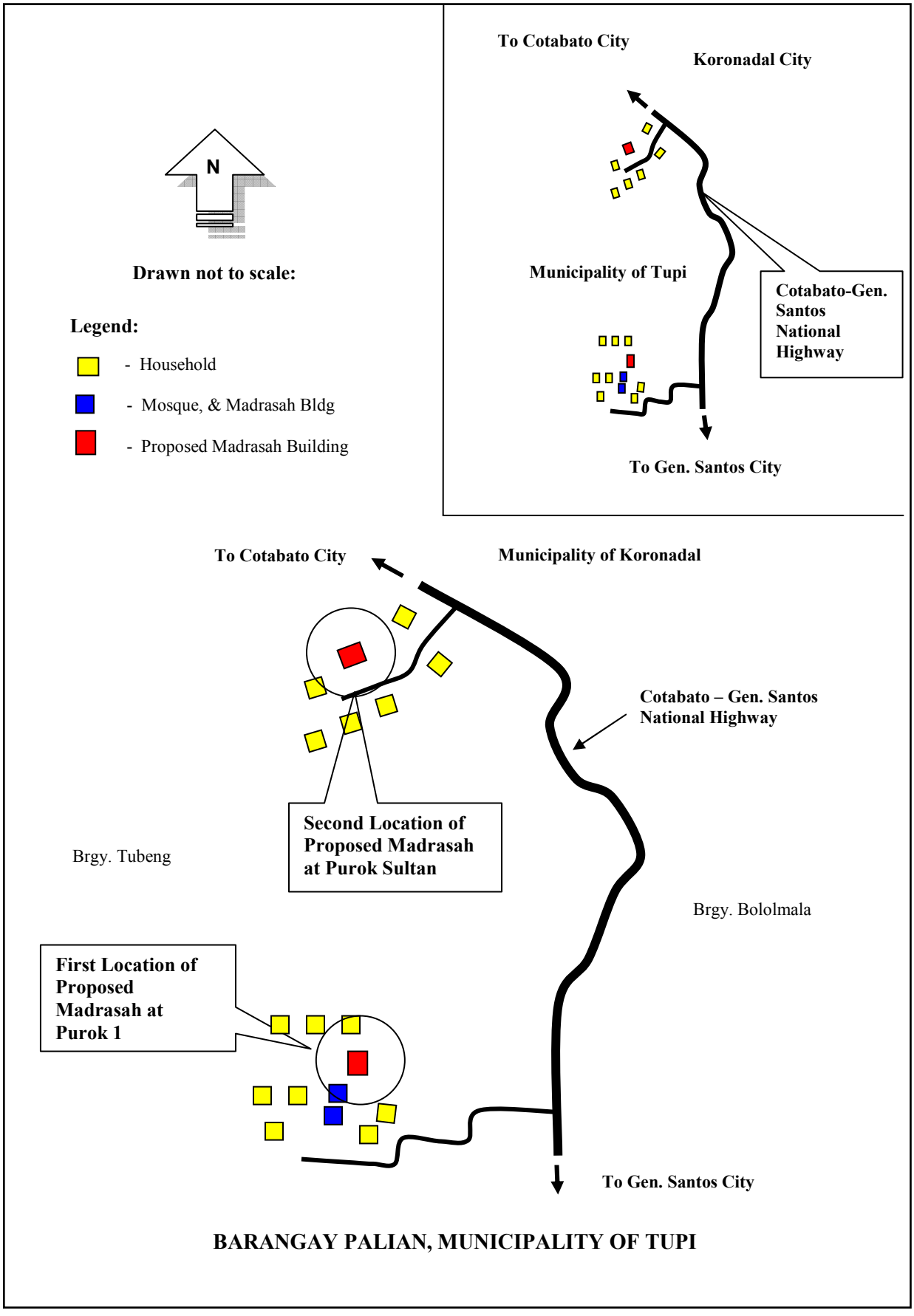
Solving for NPV, and IRR;
NPV = $\sum$Cash Flow (T-n)/ $(1+oc)^n$-T, (n=1-15)
NPV = -2.00

IRR = r ;where $\sum$Cash Flow (T-n)/ $(1+r)^n$-T=0, (n=1-15)
IRR = -4.8%

8. Attachment

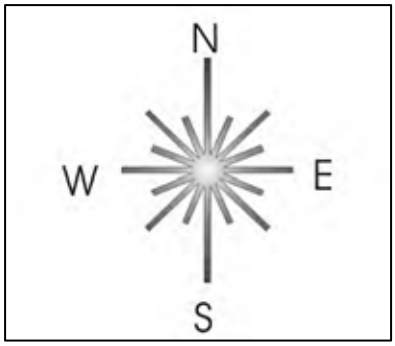
Attached is the project location map, the proposed schematic layout of the proposed Palian Madrasah Construction as well as captioned photographs.

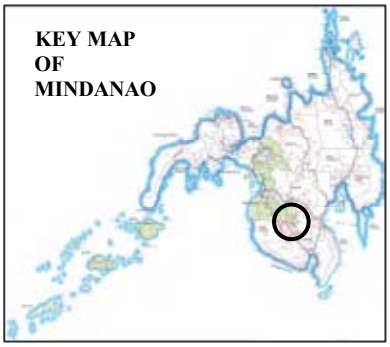
VICINITY MAP



BARANGAY PALIAN, MUNICIPALITY OF TUPI

LOCATION MAP





MUNICIPALITY OF TUPI, SOUTH COTABATO PROVINCE

PHOTOGRAPHS

This classroom is occupied by kindergarten composed of 30 pupils

This classroom is occupied by Grade I, & II composed of 45 pupils

The proposed location of one Madrasah at Purok 1 adjacent to the Mosque

The other location of the proposed Madrasah Building at Purok Sultan

APPENDIX M23-1: PENANSARAN FISHING LIVELIHOOD

IBNA Pre-Feasibility Study

1. Title and Location

Fishing Livelihood in Barangay Penansaran, Municipality of Datu Blah Sinsuat, Shariff Kabunsuan Province

2. Present Situation and Needs

The Municipality of Datu Blah T. Sinsuat is one of the ten municipalities of the province of Shariff Kabunsuan in Mindanao. Formerly a part of Upi Municipality in Maguindanao province, Datu Blah T. Sinsuat became another municipality of the Maguindanao province after a plebiscite on September 16, 2006. The municipality was named after Datu Blah T. Sinsuat, Maguindanao's delegate to the 1935 Constitutional Convention.

Barangay Penansaran is one of the barangays of Municipality of Datu Blah Sinsuat. It has a total land area of 1,115 hectares with a population of 4,344 persons based on the 2007 National Census. Penansaran is a coastal barangay characterized by plain at the western portion (seaside) by rolling hilly and undulating terrain on east side.

Penansaran is located in a remote coastal area without road connecting to the community. It can only be accessed by boat (wooden hull with engine) from Barangay Tapian, Municipality of Datu Odin Sinsuat. The boat usually takes around 40 to 50 minutes depending on the sea condition between Barangays Tapian and Penansaran. Boat is the main transportation of the residents which linking to the market, it charges fare rates of Php 35 per person. There are waiting vehicles at Barangay Tapian for people to go to their respective designation or to the market for selling their produce.

Fishing and agriculture is the main livelihood of the constituents. Approximately 40% of the community is engaged in farming, and 60% belongs to fishing. The main produce is corn others are coconut, banana, fruit trees and vegetables. However, some farmers are also a part time fisherman especially during off harvest seasons.

The offshore waters of Penansaran belong within the migratory path of tunas, and variety of fishes such as tuna,skipjack, bigeye, yellowfin, mackerel and squid. There is no available data on the volume of fishes catch, but according to the farmers, the average fishes catch is approximately three thousand (3,000) kilograms of different variety of fishes daily.

There are around 100 boats operating the area, however, only twenty five 25 boats are own by the fisherman, the 75 other boats are rented from individual in the barangay. The boat rental is depending on the fish catch within the day. Their usual sharing is equivalent to one third (1/3) catch to the owner, and two thirds (2/3) catch to the fisherman, excluding the expenses. The boats (banca) are equipped with 3 to 6 horsepower engine consisting of a narrow main hull with two attached bamboo at both sides. The owner of the boat also owns a payao where the fisherman could catch the fish.

The method of catching fishes were gillnet, hook and line, and the purse seine. A payao is a moored floating raft commonly used by fisherman to attract fish. A Payao is a fish aggregating device consisting of it floating raft anchored by a weighted line with suspended materials such as palm fronds to attract pelagic and schooling species common in deep waters. (Sec. 60 of RA 8550, The Philippine Fisheries Code of 1998).

The caught fishes are sold to some traders in the area of which are lower price compare to the commercial price. These traders are selling the fishes in the cities of Cotabato, Davao, Tacurong, and Gen. Santos. Other fishermen are selling the bought fish to Cotabato City and other nearby trading center municipalities. During the In-Depth Barangay Analyses (IBNA), the residents in Barangay

Penansaran prioritized the boat with fishing equipment for their livelihood in the area. The boat of 6 horsepower with four (4) person capacity including fishing equipment such as nylon, hook, lead, and purse seine are among their request. The total boat they are requesting is one hundred (100) units.

According to the leaders in the community they will make criteria on the selection of the fishermen to avail the boat. They will also set aside an amount for savings as soon as it will generate an income. The savings would purchase additional boat for those fishermen who did not avail.

3. Project Concept

This particular subproject would consist of several components.

1. Purchasing of boat with four (4) person capacity;
2. Purchasing of fishing equipment such as, hook, nylon, lead, for Payao, and purse seine.

4. Benefits

The project will directly benefit at least 400 families (approximately 2,000 persons) including their immediate relatives of fishermen residents of Barangay Penansaran. The livelihood project will also provide the fisherman an additional income of one-third (approximately Php 200) of their fish catches daily because they will no longer rent a boat.

The projects also provide the people with available and accessible transportation linkages from Barangay Penansaran to Barangay Tapian anytime within the day and some emergency purposes. This can also reduce the fare charges, and it will result in time savings to fisherman because they no longer wait the boat. Fisherman will no longer experience double handling of transporting their produce to Barangay Tapian.

Economic benefits will occur as a result of developments that will improve access to those areas which provide increased opportunities for commerce, reduced costs incurred as a result of shorter travel time.

5. Potential Risks

The distribution of boat to farmers is considered a potential risk because there is a possibility that it given to the wrong beneficiaries.

6. Costs Estimates

The initial estimated cost of the project is Php 2.64 million and broken down as follows:

DESCRIPTION OF ITEM	TOTAL
1.) Purchasing of boat with wooden hull, 100 units at Php 10,000	P 1.00 M
2.) Purchasing of boat engine, at Php 9,000; (100 units)	P 0.90 M
3.) Purchasing of fishing equipment at Php 5,000; (100 units)	P 0.50 M
Total	P 2.40 M
10% Contingency	P 0.24 M
Total Estimated Cost	**P 2.64 M**

7. Cost-benefit Analysis

The Annual Population Growth Rate of Shariff Kabunsuan Province is 6.12%, based on the 2007 National Census.
Growth rate (r) is 6.99%.
Number of direct beneficiaries is 300 fishermen more or less.

Rental cost of the boat is depending on the fish catch usually 1/3 fishes catched to the boat owner.
Assuming the rental cost is PhP 200/day.
Project Life is 6 years.

- **Cost**

Initial Cost: PhP 2.64 Million.
Operation and Maintenance:

a) Assume cost of maintaining and operating the boat is PhP 10,000 per boat/month including the labor cost.
b) Total Annual Cost: PhP 10,000/boat*100 boat*12 month = PhP 12,000,000/year, and increasing at 5% yearly.

Below is the computation of projected annual O&M cost:
Table 1

Year	Total Annual O&M projected at 5% $= P*(1+r)^n$ (PhP)
1	1,200,000
2	1,260,000
3	1,323,000
4	1,389,150
5	1,458,608
6	1,531,538

- **Benefits**

Fisherman's income increase:

a) Assume fisherman's income increase due to boat rental cost saving at PhP 200/day/boat, and increasing at 5% yearly

Below is the computation of projected boat rental saving:
Table 2

Year	Number of Motorboat (100 units)	Cost of Boat Rental at 5% yearly increase	Working Days (Assume 300 days/year)	Total Annual Boat Rental Savings (PhP)
1	100	200	300	6,000,000
2	100	210	300	6,300,000
3	100	221	300	6,615,000
4	100	232	300	6,945,750
5	100	243	300	7,293,038
6	100	255	300	7,657,689

- **Computation of Net Present Value, (NPV), and Internal Rate of Return (IRR)**

Assume the opportunity cost (oc) of capital cost is 10%
All values are in million pesos

Table 3

Year	Cost			Benefit		**Total Cash Flow**	**NPV TCF/ $(1+oc)^n$**
	Initial Invest-ment	O & M (Table 1)	Subtotal Cost	Boat Rental Savings (Table 2)	Subtotal Benefit		
T	-2.64		-2.64			**-2.64**	**-2.64**
T-1		1.20	1.20	6.00	6.00	4.80	4.36
T-2		1.26	1.26	6.30	6.30	5.04	4.17
T-3		1.32	1.32	6.62	6.62	5.29	3.98
T-4		1.39	1.39	6.95	6.95	5.56	3.80
T-5		1.46	1.46	7.29	7.29	5.83	3.62
T-6		1.53	1.53	7.66	7.66	6.13	3.46

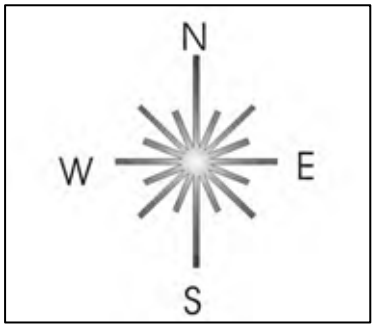
Solving for NPV, and IRR;
NPV = $\sum$Cash Flow (T-n)/ $(1+oc)^n$-T, (n=1-15)
NPV = 20.74

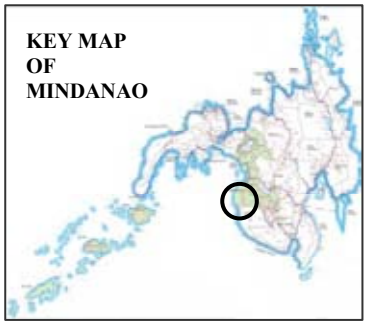
IRR = r ;where $\sum$Cash Flow (T-n)/ $(1+r)^n$-T=0, (n=1-15)
IRR = 186.4%

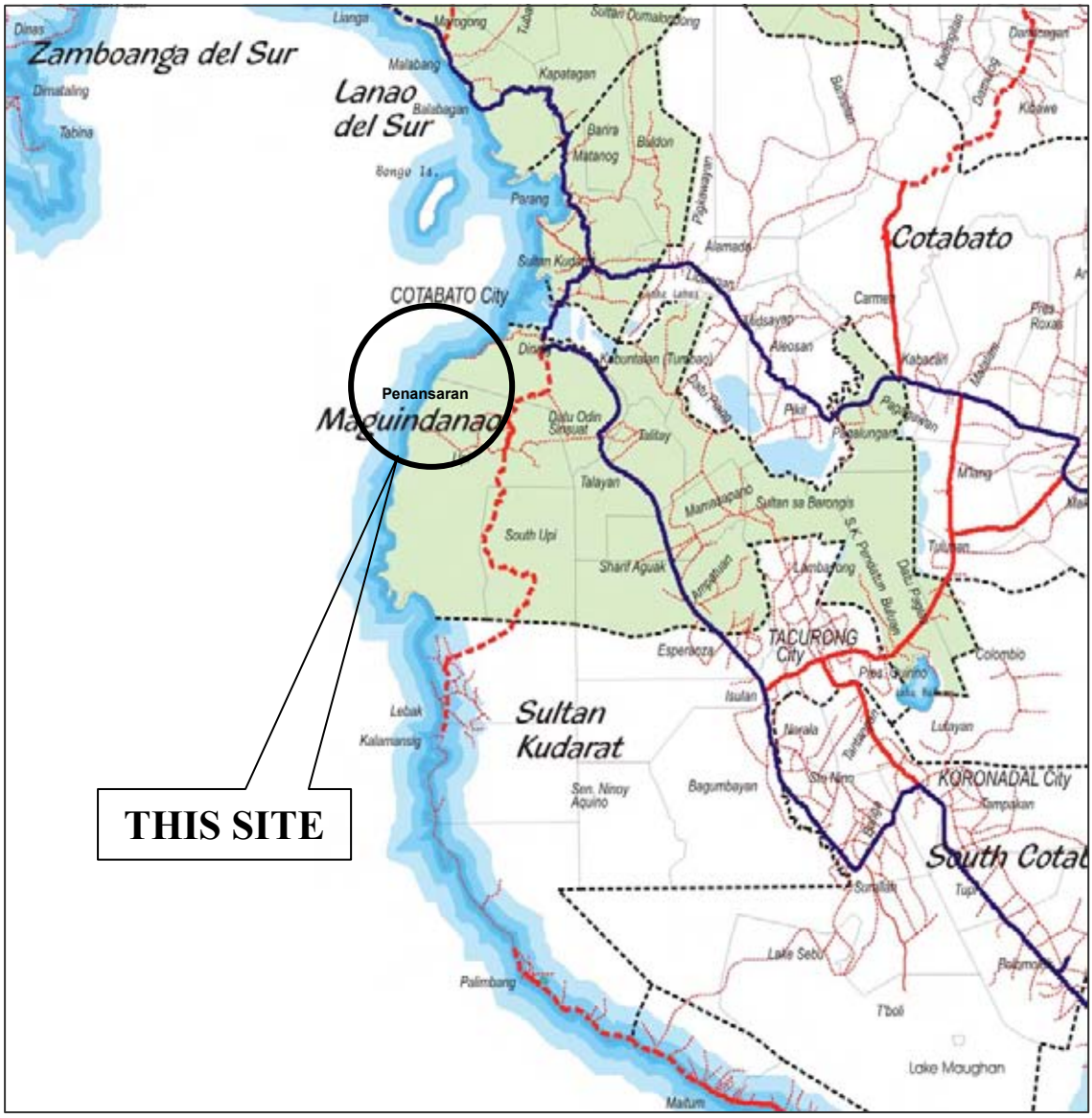
8. Attachment

Attached is the project location map of the proposed Penansaran Fishing Livelihood as well as captioned photographs.

LOCATION MAP







MUNICIPALITY OF DATU ODIN SINSUAT, SHARIFF KABUNSUAN PROVINCE

PHOTOGRAPHS

The type of boat that fishermen using for fishing

Fishing equipment and boat engine of 6 horsepower engine

APPENDIX M24-1: SAMPAO WAREHOUSE AND SOLAR DRYER CONSTRUCTION

IBNA Pre-Feasibility Study

1. Title and Location

Warehouse and Solar Dryer Construction in Barangay Sampao, Municipality of Guindulungan, Maguindanao Province

2. Present Situation and Needs

The Municipality of Guindulungan is a new municipality created by virtue of Muslim Mindanao Autonomy Act No. 139 taken from the municipality of Talayan in the province of Maguindanao. The municipality of Guindulungan can be reached by all kinds of vehicles traversing the Cotabato-General Santos National Highway. It is approximately 15 kilometers from the capitol of Shariff Aguak, and 43 kilometer from the Regional Center of Cotabato City.

Barangay Sampao is one of the barangays of the municipality of Guindulungan that agriculture is the main source of income of the residents. It has population of 2,436 persons based on 2007 National Census. It is approximately 3.30 kilometers southwest of the Cotabato – General Santos National Highway. It is accessible by all kinds of land vehicles. The main transportation is the motorcycle, which charges of PhP 0.50 per kilograms of produce, and PhP 25.00 per passenger.

Majority of the residents at Barangay Sampao are mostly farmers which accounts for 90% or 1,320 persons, of the population. It biggest produce is rice covers of approximately 300 hectares of irrigated farm rice and 100 hectares corn fields. It yields an average of 90 sacks or 4.5 tons of rice per harvest per hectare, and it can generate 2 to 3 cropping of rice a year. Presently, one of the problems of the farmers in the area is the unavailability of solar dryer for drying of rice produce.

During harvest season, farmers are selling undried rice grains directly to the market at Tambunan Poblacion because of absence of storage facility and solar dryer in the area. The price of wet rice is eight peso and Php 8.50, and the dried rice is Php 11.50. The difference between dry and wet is Php 3.00 per kilogram or Php 150 per sack, which a good saving for the farmers. The saving money could be an added income of farmers to bear the high cost of fertilizer and transportation.

With the abundance of rice during harvest season, the price of rice is further lower by Php 0.50 per kilograms during peak seasons. Without the warehouse some of the farmers are using part of their houses as storage for their harvest predisposing the grains to infestation by storage pests and biological deterioration. The warehouse can take grains for some time and wait for better selling price in the market.

The project aims to help the need of a post-handling facility. The project will provide farmers a 1-unit 64-m² warehouse, and 12m x 24m, or 288 m² of solar dryer. The solar dryer can accommodate 60 bags of rice, and can be dried within 2 days. It will help the farmers increase their income with good well dried harvest compare to the wet grains they are selling outright to market.

3. Project Concept

This particular subproject would consist of several components.

1. The backfilling of the site of the warehouse and solar dryer of approximately 500 m². This is to elevate the warehouse and solar dryer;
2. The construction of 8m x 8m warehouse with steel trusses, including electrical facilities, and the construction of 12m x 24m concrete solar dryer; and
3. The rehabilitation of the road leading to the proposed warehouse and solar dryer.

4. Benefits

The project will directly benefit at least 50% of farmers and members and their families. It will address the need for a post-harvest facility and solar dryer that will be used in storing, and drying grains produced in the area. Fully dried rice and corn sells at 4 peso higher price than undried or inadequately dried rice and corn. Farmers can hold the grains in the warehouse for some time and wait for better selling price.

5. Potential Risks

The possible potential risk of the project is after the completion and turn-over to the communities or any line agencies concern such as, barangay government and/or farmers association, but if would be very lightly. This is only the Operation and Maintenance (O & M), and management of the building facilities including its amenities.

6. Costs Estimates

The initial estimated cost of the project is PhP 1.10 million, and broken down as follows:

Work Description	Total Cost
1. Earthworks, to elevate the warehouse and solar dryer	0.05 M
2. Warehouse (8m x 8m)	0.75 M
3. Solar Dryer (12m x 24m)	0.20 M
Total	PhP 1.00 M
10% Contingency	0.10 M
Total Estimated Cost	**PhP 1.10 M**

7. Cost-benefit Analysis

The Annual Population Growth Rate of Maguinadanao Province is 6.99%, based on the 2007 National Census
Numbers of beneficiaries are 730 farmers more or less, or 50% of population
Project Life is 15 years

a) The dryer can produce dried rice at 8 tons a week or 8,000 kilograms
b) Total yield for 9 months period (2-3crop cycle) = 9 months/year*4 week/month*8,000 kgs/week
c) Total Annual Dried Products = 288,000 kg/year, assume no increase of production
Below is the computation of projected annual population:
Table 1

Year	Total Annual Dried Product (Kg)
1	288,000
2	288,000
3	288,000
4	288,000
5	288,000
6	288,000
7	288,000
8	288,000
9	288,000
10	288,000
11	288,000
12	288,000
13	288,000
14	288,000
15	288,000

- **Cost**

Initial Cost: PhP 1.10 Million

Operation and Maintenance

a) Assume cost of maintaining the building at PhP 30,000 per year, and cost of labor is 40%: Material Cost = PhP 30,000; Labor Cost = PhP 30,000*0.40 = PhP 12,000
b) Total Annual Cost = PhP 42,000; Assume an increase of 5% yearly

Below is the computation of projected annual O&M cost:

Table 2

Year	Total Annual O&M projected = $P*(1+r)^n$ (PhP)
1	42,000
2	44,100
3	46,305
4	48,620
5	51,051
6	53,604
7	56,284
8	59,098
9	62,053
10	65,156
11	68,414
12	71,834
13	75,426
14	79,197
15	83,157

- **Benefits**

Increase of Income

a) An increase of income at PhP 3/kg for well dried rice.
b) Assume an increase of price/kg at 5% per year.

Using the data from Table 1

Below is the computation of projected annual income:

Table 3

Year	Total Annual Dried Product (Table 1)	Increase of Cost per Kg (PhP)	Total Annual Additional Income (PhP)
1	288,000	3.00	604,800
2	288,000	3.15	635,040
3	288,000	3.31	666,792
4	288,000	3.47	700,132
5	288,000	3.65	735,138
6	288,000	3.83	771,895
7	288,000	4.02	810,490
8	288,000	4.22	851,014
9	288,000	4.43	893,565
10	288,000	4.65	938,243
11	288,000	4.89	985,155
12	288,000	5.13	1,034,413
13	288,000	5.39	1,086,134
14	288,000	5.66	1,140,441
15	288,000	5.94	1,197,463

- **Computation of Net Present Value, (NPV), and Internal Rate of Return (IRR)**

Assume the opportunity cost (oc) of capital cost is 10%
All values are in million pesos
Table 4

Year	Cost			Benefit		Total Cash Flow	NPV TCF/ $(1+oc)^n$
	Initial Invest-ment	O&M (Table 2) (PhP)	Subtotal Cost (PhP)	Additional Increase of Income (Table 3)	Subtotal Benefit (PhP)		
T	1.10		1.10			-1.10	-1.10
T-1		0.04	0.04	0.60	0.60	0.56	0.51
T-2		0.04	0.04	0.64	0.64	0.59	0.49
T-3		0.05	0.05	0.67	0.67	0.62	0.47
T-4		0.05	0.05	0.70	0.70	0.65	0.44
T-5		0.05	0.05	0.74	0.74	0.68	0.42
T-6		0.05	0.05	0.77	0.77	0.72	0.41
T-7		0.06	0.06	0.81	0.81	0.75	0.39
T-8		0.06	0.06	0.85	0.85	0.79	0.37
T-9		0.06	0.06	0.89	0.89	0.83	0.35
T-10		0.07	0.07	0.94	0.94	0.87	0.34
T-11		0.07	0.07	0.99	0.99	0.92	0.32
T-12		0.07	0.07	1.03	1.03	0.96	0.31
T-13		0.08	0.08	1.09	1.09	1.01	0.29
T-14		0.08	0.08	1.14	1.14	1.06	0.28
T-15		0.08	0.08	1.20	1.20	1.11	0.27

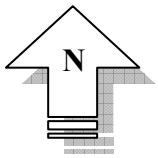
Solving for NPV, and IRR;
NPV = $\sum$Cash Flow (T-n)/ $(1+oc)^n$-T, (n=1-15)
NPV = 4.55

IRR = r ;where $\sum$Cash Flow (T-n)/ $(1+r)^n$-T=0, (n=1-15)
IRR = 56.0%

7. Attachment

Attached are the project location map, the proposed development plan as well as captioned photographs highlighting the road and its vicinity.

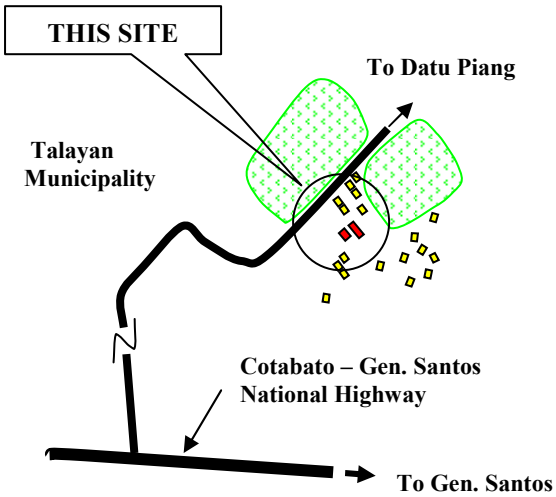
VICINITY MAP



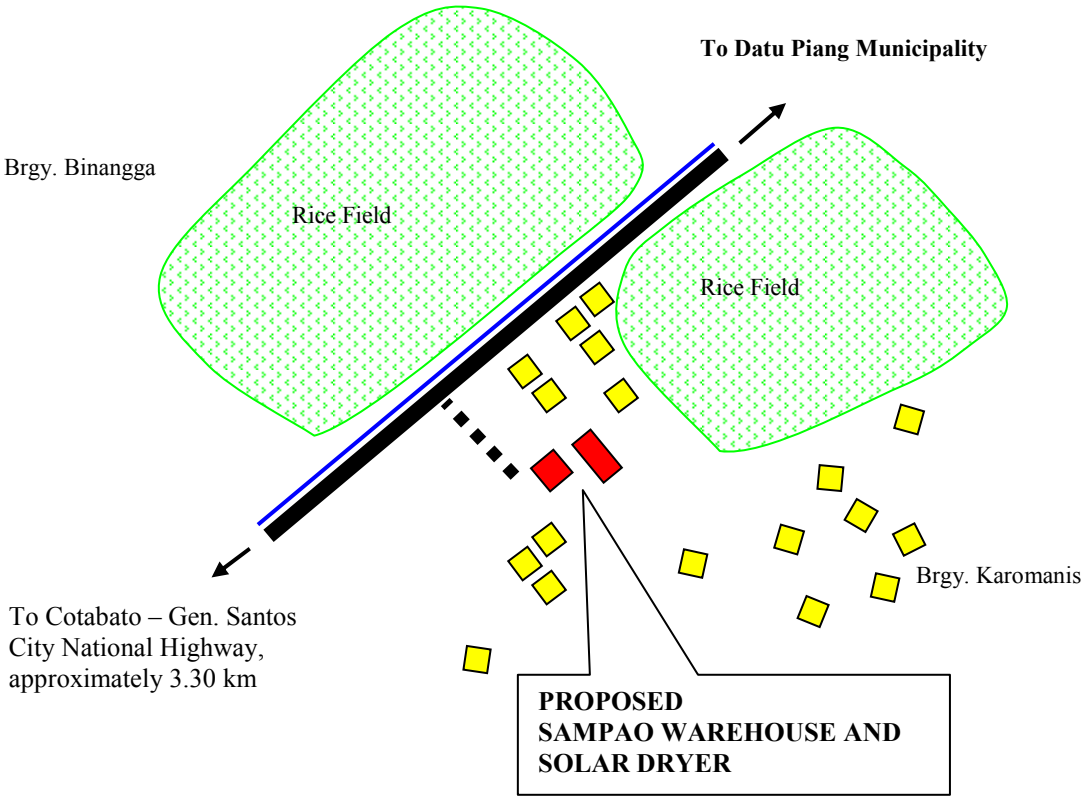
Drawn not to scale:

Legend:

- Household
- Rice Field
- Proposed Warehouse and Solar Dryer

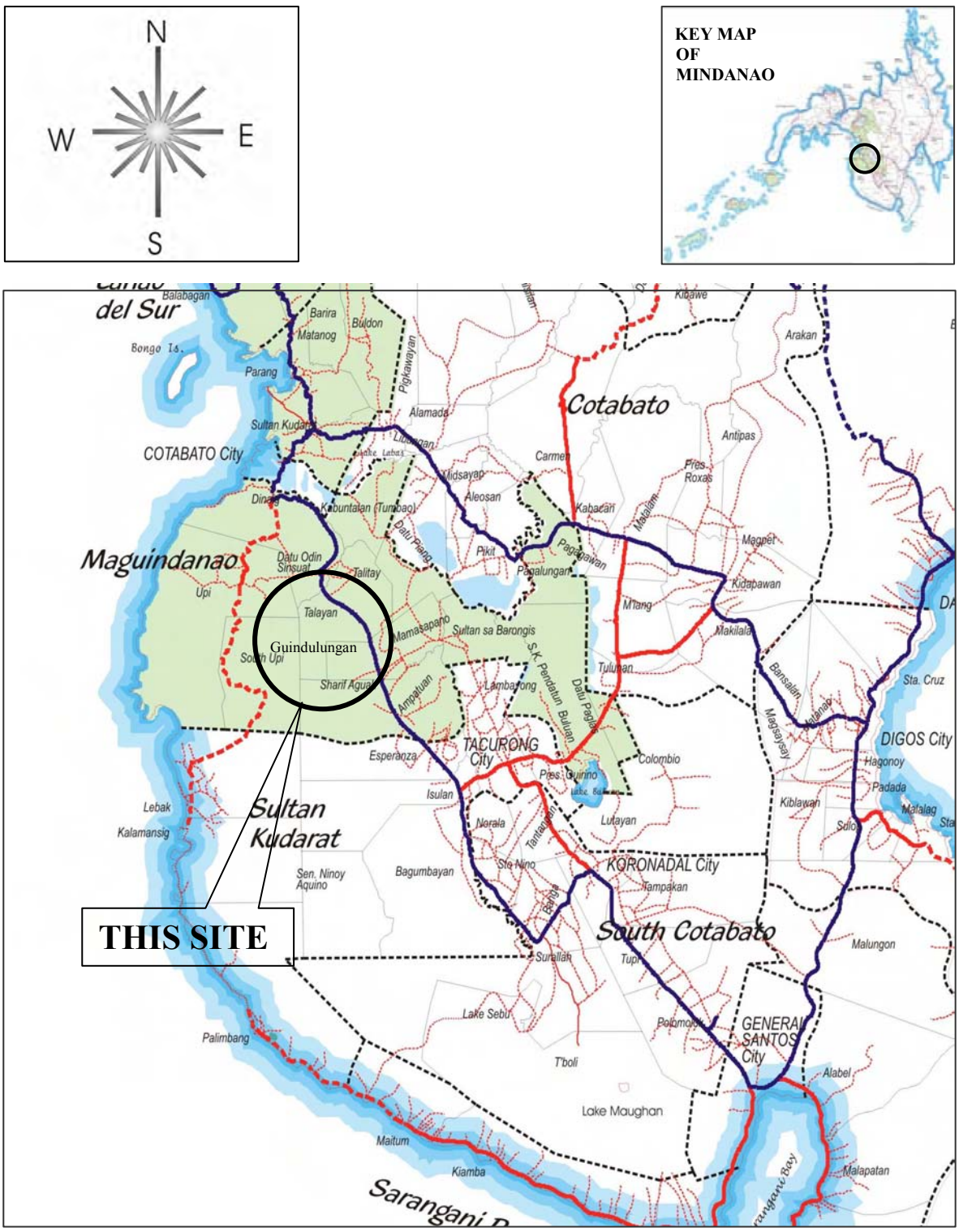


Municipality of Guindulungan



BARANGAY SAMPAO, MUNICIPALITY OF GUINDULUNGAN

LOCATION MAP



MUNICIPALITY OF GUINDULUNGAN, MAGUINDANAO PROVINCE

PHOTOGRAPHS

Rice field ready for planting at Barangay Sampao

Proposed location of concrete solar dryer

Proposed location of warehouse building