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Prepared by:

Irene Bibera

Mirasol Cañedo

Jesson Rey Sabado

Sapphire Polinar

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Impact Assessment of Katipunan Semong Irrigators Service Association (KASEISA), Kapalong, Davao del Norte

**CHAPTER 1**

**Introduction**

Farming is one of the sources of income especially in rural areas. It is very essential for them to keep their production growing. In order to keep it productive, irrigation system is one way to help them achieve their desire. Irrigation is the artificial application of water to the land or soil. It is used to assist in the growing of agricultural crops, maintenance of landscapes, and revegetation of disturbed soils in dry areas and during periods of inadequate rainfall. Hence, development of irrigation and drainage is essential for the continuous and stable agricultural production.

**About the Project**

The Katipunan Semong irrigators Service Association (KASEISA), Inc. is entrusted by NIA to run the Operation and Maintenace of Semong Communal Irrigation System. It is adjacent to the Libuganon Right River Irrigation System, and the Gubayan Communal Irrigation System both located in Kaplong, Davao del Norte. It is 81 kilometers north of Davao City and 45 kilometers north of NIA-Davao del Norte Irrigation Management Office at Sto. Nino, Carmen, Davao del Norte. It covers a service area of 310.05 hectares located at Katipunan and Semong, Kaplong, Davao del Norte benefiting 280 farmer-members.

The Semong Communal Irrigation System (CIS) is considered the rice granary of Kapalong, Davao del Norte. It all started when President Magsaysay called upon the Ilocanos of Luzon to migrate to Minadano, and then called as the Land of Promise. A few of them settled in barangay Semong named after the river which traversed the barangay. They started kaingin on the second growth forest for planting rain fed rice in the early 1970s.

**Water Distribution**

Under normal conditions, the simultaneous water distribution is done as the discharge of the Semong River more than sufficient. Distribution on the lateral canals is rotated to the different turn-outs based on the agreed water scheduling by the lateral chairman and officers especially when the intake discharge is lower than 400 litres per second. If the discharge drops to less than 200 litres per second water distribution is prioritized to members in good standing and those in dire need of water at the critical stage of the rice crop growth period. A fine of 500 pesos is levied to those farmers who violate the schedule.

**Cropping Calendar and Pattern of Planting**

The first crop is from October to March. Dam closure is on April 2 and opening of the gates is on May 1. The second crop is from April to September with dam closure on October 3 and reopening of the gates on November 1.

**Repair and Maintenance**

Maintenance of the dam is scheduled twice (2) a year through the “bayanihan spirit” usually every last week of April and October. The IA officers and the lateral leaders mobilize the members under the supervision of the IA President and the BOTs. Shovel and bolos are required from the members. Snacks are provided by the IA as an incentive. In cases of floods where the plenty of debris is stuck up at the dam emergency bayanihan is then called for the purpose. The clearing of the main lateral canals are done according to the designated length per member and agreed upon by the members availing water from the lateral canal.

**Rationale**

Increasing water scarcity is posing a major challenge for meeting the continuously growing demand for water from all sectors. In many developing countries, in particular, this crisis is likely to be further exacerbated by the negative impacts of climate change on overall water availability. Potentials for mobilizing additional water resources are often limited and extremely costly to realize. Consequently, irrigated agriculture as the largest water user will face growing competition for scarce water resources from other sectors with higher use efficiency and value added. For meeting the ever increasing demand for food, fiber and other products, irrigated areas wherever feasible have to be extended, and existing irrigation schemes often require rehabilitation or modernization to ensure a more rational and efficient water use. However, related additional investments are substantial and accordingly require adequate financial and economic justification.

Irrigation projects and programs prior to a positive investment decision need to be justified in terms of their financial and economic profitability and the resulting contributions towards increasing a country’s or society’s welfare. Irrigation projects and programs typically represent the most expensive investment type, in terms of specific unit costs per area developed. Furthermore, in the absence of significant financial participation of farmers to initial investment costs (and often also in subsequently recovering recurrent operation and maintenance (O&M) and replacement costs) public subsidies accruing to project beneficiaries are substantial and usually much higher than for other agricultural or non-agricultural investments. Consequently, current and future irrigation investments require adequate economic justification for effectively mobilizing the substantial public and private investments.

Economic analysis of agricultural projects needs to compare costs with benefits and to determine how well, or how poorly, a planned action will turn out. The costs and benefits analysis especially on irrigation projects therefore must be identified. Furthermore, once costs and benefits are known, they must be priced, and their economic values determined. A cost benefit analysis finds, quantifies, and adds all the positive factors. These are the benefits. Then it identifies, quantifies, and subtracts all the negatives, the costs. The difference between the two indicates whether the planned action is advisable.

**Objectives**

The Benefit-cost analysis of communal irrigation system in barangay Semong, Kapalong main objective is to assess whether it is helpful for the farmers to put up an irrigation system. Specifically, this comparative evaluation method aims:

1. To compare costs and benefits of the project; and
2. To be aware if putting up irrigation is beneficial or not in farmers as well as for the whole society in Kapalong.

The following are the Benefits and Costs of an Irrigation Project:

**Irrigation Benefits:**

Incremental agricultural output from expanded service area; Increase opportunity for diversification and higher stable farm income; Increased household spending due to expanded service area and other source of income after the project; Increased or expanded agricultural area; Savings obtained from service area; time cost and labor cost.

**Irrigation Costs:**

Costs of project input; Area lost due to establishment of new structures for irrigation; Opportunity cost of water, depletion, premium, etc; Relocation of families affected by right of way if an; Costs of expanding service area and additional project cost for irrigation.

**CHAPTER 2**

**METHODOLOGY**

**Method Used**

The material used in the evaluation of Katipunan Semong Irrigators Service Associations (KASEISA) is a survey questionnaire following the conceptual framework given below.

**Conceptual Framework**

Semong Irrigation System

Quantifying Benefits and Costs

Impact Assessment

Figure 1: The process of Impact Assessment for

Semong Irrigation System

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The first step of the Conceptual Framework is data collection of the Semong Irrigation System through a survey and followed by quantifying benefits and costs using Benefit-Costs Analysis then an Impact Assessment will be realized through an increase in income for good life.

Annex 1 below was the questionnaire used during the survey for the Katipunan Semong Irrigators Service Associations (KASEISA).

**CHAPTER 3**

**COSTS AND BENEFITS**

**COST OF IRRIGATION SYSTEM**

**Initial Costs**

Salaries and Wages 1,629,893.77

Skilled 488,968.13

Unskilled 1,140,925.64

Travelling Expense 72,749.90

Sundries 98,091.00

Cement 506,600.00

RSB 293,050.00

Hardware 92,844.25

Lumber 22,110.00

Equipment rental 329,424.55

Fuel/oil 150,802.75

Spare parts 260,480.60

Other materials 356,922.39

**3,812,969.21**

**BENEFITS**

Financial Benefits (Irrigation System)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Dry cropping** | |  | **Wet Cropping** | |  |
| Name of lateral | Collectibles(per harvest) | Collectibles (Annually) | Name of lateral | Collectibles(per Harvest) | Collectibles (Annually) |
| Lateral A | 121.95 | 4390.20 | Lateral A | 162.6 | 5853.60 |
| Lateral B | 107.19 | 3858.84 | Lateral B | 142.92 | 5145.12 |
| Lateral C | 82.08 | 2954.88 | Lateral C | 109.44 | 3939.84 |
| Lateral D | 134.76 | 4851.36 | Lateral D | 179.68 | 6468.48 |
| Lateral E | 83.7 | 3013.20 | Lateral E | 111.6 | 4017.60 |
| Lateral F | 125.22 | 4507.92 | Lateral F | 166.96 | 6010.56 |
| Lateral G | 35.4 | 1274.40 | Lateral G | 47.2 | 1699.20 |
| **Total** |  | **24850.80** |  |  | **33134.40** |
| Annual Income of Irrigation System | **57985.20** |  |  |  |  |
|  |  |  |  |

Economic Benefits

|  |  |  |
| --- | --- | --- |
| **Crops** | **Yeild** | **Income(per year)** |
| Banana | 20,000.72 | 600,021.60 |
| Palay | 50,700.28 | 760,504.20 |
| **Total** |  | **1,360,525.80** |

**Total Benefits**

|  |  |
| --- | --- |
| Financial | 57,985.20 |
| Economic | 1,360,525.80 |
| **Total** | **1,418,511.00** |

**ADJUSTMENTS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Initial Cost** | **Financial Cost** | **Shadow Factor** | **Economic Cost** |
| Salaries and wages |  |  |  |
| Skilled | 488,968.13 | 100% | 488,968.13 |
| Unskilled | 1,140,925.64 | 60% | 684,555.38 |
| Traveling Expenses | 72,749.90 | 90% | 65,474.91 |
| Sundries | 98,091.00 | 90% | 88,281.90 |
| Cement | 506,600.00 | 90% | 455,940.00 |
| RSB | 293,050.00 | 90% | 263,745.00 |
| Hardware | 92,844.25 | 90% | 83,559.83 |
| Lumber | 22,110.00 | 90% | 19,899.00 |
| Equipment rental | 329,424.55 | 90% | 296,482.10 |
| Fuel/ Oil | 150,802.75 | 90% | 135,722.48 |
| Spare Parts | 260,480.60 | 90% | 234,432.54 |
| Other materials | 356,922.39 | 90% | 321,230.15 |
|  | **3,812,969.21** |  | **3,138,291.41** |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Maintenace** | **Finacial Cost** | **ShadowFactor** | **Economic Cost** |
| Salaries and wages | 108,000.00 | 100% | 108,000.00 |
|  | **108,000.00** |  | **108,000.00** |

**Comparing Benefits and Costs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Year** | **2000** | **2001** | **2002** | **2003** | **2004** | **2005** |
| **Cost** | 3,138,291.41 | 108,000 | 108,000 | 108,000 | 108,000 | 108,000 |
| **Benefit** |  | 1,418,511.00 | 1,418,511.00 | 1,418,511.00 | 1,418,511.00 | 1,418,511.00 |
| **Profit** | **3,138,291.41** | **1,310,511.00** | **1,310,511.00** | **1,310,511.00** | **1,310,511.00** | **1,310,511.00** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Year** | **2006** | **2007** | **2008** | **2009** | **2010** | **2011** |
| **Cost** | 108,000 | 108,000 | 108,000 | 108,000 | 108,000 | 108,000 |
| **Benefit** | 1,418,511.00 | 1,418,511.00 | 1,418,511.00 | 1,418,511.00 | 1,418,511.00 | 1,418,511.00 |
| **Profit** | **1,310,511.00** | **1,310,511.00** | **1,310,511.00** | **1,310,511.00** | **1,310,511.00** | **1,310,511.00** |

**Net Present Value and IRR**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Costs** | **Benefit** | **Net Benefit** | [**df@15%**](mailto:df@15%25) | [**PV@15**](mailto:PV@15) | [**DF@18**](mailto:DF@18) | [**PV@18**](mailto:PV@18) |
| 0 | 3,138,291.41 | (3,138,291.41) | 3,138,291.41 | 1 | (3,138,291.41) | 1 | (3,138,291.41) |
| 1 | 108,000 | 1,418,511.00 | 1,310,511.00 | 0.869565 | 1,139,574.78 | 0.847458 | 1,110,602.54 |
| 2 | 108,000 | 1,418,511.00 | 1,310,511.00 | 0.756144 | 990,934.59 | 0.718184 | 941,188.60 |
| 3 | 108,000 | 1,418,511.00 | 1,310,511.00 | 0.657516 | 861,682.26 | 0.608631 | 797,617.45 |
| 4 | 108,000 | 1,418,511.00 | 1,310,511.00 | 0.571753 | 749,288.92 | 0.515789 | 675,946.99 |
| 5 | 108,000 | 1,418,511.00 | 1,310,511.00 | 0.497177 | 651,555.58 | 0.437109 | 572,836.44 |
| 6 | 108,000 | 1,418,511.00 | 1,310,511.00 | 0.432328 | 566,570.07 | 0.370432 | 485,454.61 |
| 7 | 108,000 | 1,418,511.00 | 1,310,511.00 | 0.375937 | 492,669.63 | 0.313925 | 411,402.21 |
| 8 | 108,000 | 1,418,511.00 | 1,310,511.00 | 0.326902 | 428,408.37 | 0.266038 | 348,645.94 |
| 9 | 108,000 | 1,418,511.00 | 1,310,511.00 | 0.284262 | 372,529.02 | 0.225456 | 295,462.66 |
| 10 | 108,000 | 1,418,511.00 | 1,310,511.00 | 0.247185 | 323,938.28 | 0.191064 | 250,392.09 |
|  |  |  |  | ***NPV*** | **3,438,860.08** | ***NPV*** | **2,751,258.11** |
|  |  |  |  | ***IRR*** | **22%** | ***IRR*** | **19%** |

**CHAPTER 4**

**Recommendations**

The net present value of the communal irrigation project based on the results of the analysis at 15% interest rate is 1,254,744.72, and if the interest rate will increase at 18% the net present value becomes 959,900.61which imply that as interest rate increases, the net present value decreases. The net present value (NPV) emphasized the importance of the project at given cost and benefits computed in this study. The NPV is the total discounted value of all benefits and cost associated in the project. The Internal Rate of Return was at 22%. This represents that the investors loanable amount should not exceed 22% of their income to refrain from any losses.

**TABLE OF CONTENTS**

**CHAPTER Titles PAGE**

**1**  Introduction……………………………………….…………1

About the Project……………………………………1

Water Distribution…………………………………...2

Cropping Calendar and Pattern of Planting……...2

Repair and Maintenance…………………………...3

Rationale……………………………………………..3

Objectives……………………………………………5

Irrigations Benefits………………………………….5

Irrigations Costs…………………………………….5

**2**  Methodology………………………………………………..7

Method Used………………………………………..7

Conceptual Framework…………………………….7

Annex 1-survey questionnaire

**3** Costs and Benefits………………………………………….8

Cost of Irrigation System…………………………...8

Financial Benefits……………………………………9

Economic Benefits…………………………………..9

Total Benefits……………………………………….10

Adjustments…………………………………………10

Comparing Benefits and Costs……………………11

Net Present Value and IRR………………………..11

**4** Recommendations……………………………………….....12