**10.0 Cost Benefit Analysis**

**10.1 Intangible Costs**

Intangible costs are those that cannot be measured by monetary value. It involves the ability of the users to learn about the new system and how fast they can adapt. Another would be their willingness to shift to a new system. It is an important factor because that will affect the efficiency of the users to learn and adapt to the new system. Not all would be willing to change because some do not have the proper skills to adapt to a new system.

**10.2 Tangible Costs**

Tangible costs are those that involve monetary value. They include the development and installation costs of the new system. In there would be costs like software expenses, office supplies for testing the new system and fee for the developers. Operational costs include employee salaries, office supplies and other monthly fees.

**Table 10-1 System Cost**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **DEVELOPMENT** | **UNIT COST** | **QUANTITY** | **AMOUNT** | **SUB-TOTAL** |
| **HARDWARE** | | | | |
| Laptop | 25,000.00 | 4 | 100,000.00 |  |
| **SOFTWARE** | | | | |
| Windows 10 | 0.00 | 4 | 0.00 |  |
| Netbeans 8.1 | 0.00 | 4 | 0.00 |  |
| Android Studio | 0.00 | 4 | 0.00 |  |
| MySQL | 0.00 | 4 | 0.00 |  |
| HighCharts | 0.00 | 1 | 0.00 | 100,000.00 |
| **DEVELOPERS** | | | | |
| Programmers and Analysts | 10,000.00 | 4 | 40,000.00 | P140,000.00 |
| **Total Development Cost = P 140,000** | | | | |
| **INSTALLATION** | **UNIT COST** | **QUANTITY** | **AMOUNT** | **SUB-TOTAL** |
| **HARDWARE** | | | | |
| Smartphones with SIM Card | 0 | 3,000 | 0 | 0 |
| **SOFTWARE** | | | | |
| Windows 10 | 0.00 | 5 | 0.00 |  |
| Netbeans 8.1 | 0.00 | 5 | 0.00 |  |
| MySQL | 0.00 | 5 | 0.00 |  |
| HighCharts | 0.00 | 1 | 0.00 | 140,000.00 |
| **SUPPLIES** | | | | |
| Bond Paper | 1.00 | 200 | 100.00 | 140,200.00 |
| **TRAINING** | | | | |
| Training fee | 500.00 | 4 | 2000.00 | 142,200.00 |
| **Total Installation Cost= P 142,200.00** | | | | |

**Total System Cost = Total Development Cost + Total Installation Cost**

**= 140,000 +2,200.**

**= P 142,200.00**

**Table 10-2 Existing Operational Cost**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **UNIT COST** | **QUANTITY** | **AMOUNT** | **SUB-TOTAL** |
| **SALARIES** | | | | |
| Mill District Officer | 30,000.00 | 1 | 30,000.00 | 30,000.00 |
| Board Member | 100,000.00 | 5 | 500,000.00 | 530,000.00 |
| Surveyors | 15,000.00 | 2 | 30,000.00 | 580,000.00 |
| **TELEPHONE/CELLPHONE EXPENSE** | | | | |
| PLDT Landline and Broadband | 5,000.00 | 1 | 5,000.00 | 585,000.00 |
| **SUPPLIES** | | | | |
| Short and Long Bond Paper | 1.00 | 7,000 | 7,000.00 | 592,000.00 |
| Printer Ink | 2,500.00 | 4 | 10,000.00 | 602,000.00 |
| **Total Monthly Existing Cost= 602,000.00** | | | | |
| **Total Annual Existing Cost= 7,224,000.00** | | | | |

**Table 10-3 Proposed Operational Costs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **UNIT COST** | **QUANTITY** | **AMOUNT** | **SUB-TOTAL** |
| **SALARIES** | | | | |
| Mill District Officers | 30,000.00 | 1 | 30,000.00 | 30,000.00 |
| Board Members | 100,000.00 | 5 | 500,000.00 | 530,000.00 |
| **TELEPHONE/CELLPHONE EXPENSE** | | | | |
| PLDT Landline and Broadband | 5,000.00 | 1 | 5,000.00 | 535,000.00 |
| **SUPPLIES** | | | | |
| Short and Long Bond Paper | 1.00 | 3,000 | 3,000.00 | 538,000.00 |
| Printer Ink | 2,500.00 | 2 | 5,000.00 | 543,000.00 |
| **Total Monthly Proposed Cost= 543,000.00** | | | | |
| **Total Annual Proposed Cost= 6,516,000.00** | | | | |

**10.3 Intangible Benefits**

Intangible benefits are those that cannot be measured by monetary value. These benefits include faster processing of transactions and generating reports. Data will be stored in a more secure way and it will be easier to locate with the use of a database. It will help the company find data in a computer instead of file cabinets. The overall process will improve and be much faster.

**10.4 Tangible Benefits**

After the proposed system is implemented, there will a reduction in overall operating costs for the company. There will be no need for surveyors since the mobile application will help both the MDO and farmers gather farm data. Papers will also be reduced since surveys will be done in the mobile app as well.

**Total Annual Benefits = Annual Existing Operating Cost- Annual Proposed Operating Cost**

**= 7,224,000.00- 6,516,000.00**

**= P 708,000.00**

**10.5 Analysis**

**10.5.1 Payback Analysis**

Payback period is analyzing how much time is needed in order to recover the cost that has been used in the development and implementation of a system. Payback analysis is usually done to determine the benefits after the system has been implemented and could be used in major decision making. The payback period corresponds to the time necessary to recover system’s cost.

*Payback Period =* System Cost / Annual Benefits

= 1**42,200/708,000**

**= 0.2**

**=0.2\* 12 = 2.4**

**10.5.2 Return on Investment**

The return on investment or ROI is a percentage rate that measures profitability by comparing the total net benefits received from a project to the total cost of the project. If the ROI has a positive percentage then it is a feasibly project, the higher the percentage the better investment is.

*Return on Investment =* (Total Benefits – Total Costs)/ Total Costs

= (**708,000-142,200)/ 708,000\*100**

= **79.91%**

**10.5.3 Net Present Value**

Net Present Value is the value of cumulative benefits minus cumulative cost of the lifespan of the system. It is defined as the total present value (PV) of a certain time frame of cash flows. It is a standard for using the time value of money to assess continuing projects. Present value is the monetary value invested today at a specified interest that grows at exactly one peso at certain time in the future.

Present Value Interest Factor = 1 / (1 + i) n

i = Inflation Rate, Discount Rate

= 4% as of 2016, Central Bank of the Philippines

n = Number of years from now

Table 7-5 PVIF

|  |  |
| --- | --- |
| **YEAR** | **PVIF** |
| 0 | 1 |
| 1 | 0.96 |
| 2 | 0.92 |
| 3 | 0.89 |
| 4 | 0.85 |

Present Value of Cost is also needed to compute for the Net Present Value. To get the Present Value of Cost you need to multiply the annual cost to Present Value Interest Factor.

Table 7-6 Present Value of Costs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Present Value of Costs** | | | | |
| **YEAR** | **PVIF** | **COSTS** | **PV** | **CUMULATIVE** |
| 0 | 1 | 142,000 | 142,000 | 142,000 |
| 1 | 0.96 | 7,224,000 | 6935040 | 7,077,040 |
| 2 | 0.92 | 7,224,000 | 6646080 | 13,723,120 |
| 3 | 0.89 | 7,224,000 | 6429360 | 20,152,480 |
| 4 | 0.85 | 7,224,000 | 6140400 | 26,292,880 |

After computing for the Present Value of Costs, you will now compute for the Present Value of Benefits. To get the Present Value of Benefits you need to multiply the annual benefits to Present Value Interest Factor.

Table 7-7 Present Value of Benefits

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Present Value of Benefits** | | | | |
| **YEAR** | **PVIF** | **BENEFITS** | **PV** | **CUMULATIVE** |
| 0 | 1 | 0.00 | 0.00 | 0.00 |
| 1 | 0.96 | 708,000 | 679,680 | 679,680 |
| 2 | 0.92 | 708,000 | 651,360 | 1,331,040 |
| 3 | 0.89 | 708,000 | 630,120 | 1,961,160 |
| 4 | 0.85 | 708,000 | 601,800 | 2,562,960 |

Table 7-8 Net Present Value

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **COSTS** | | | **BENEFITS** | | |
| **YEAR** | **PVIF** | **COSTS** | **PV** | **CUMULATIVE** | **BENEFITS** | **PV** | **CUMULATIVE** |
| 0 | 1 | 142,000 | 142,000 | 142,000 | 0.00 | 0.00 | 0.00 |
| 1 | 0.96 | 7,224,000 | 6935040 | 7,077,040 | 708,000 | 679,680 | 679,680 |
| 2 | 0.92 | 7,224,000 | 6646080 | 13,723,120 | 708,000 | 651,360 | 1,331,040 |
| 3 | 0.89 | 7,224,000 | 6429360 | 20,152,480 | 708,000 | 630,120 | 1,961,160 |
| 4 | 0.85 | 7,224,000 | 6140400 | **P26,292,880** | 708,000 | 601,800 | **P2,562,960** |