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**