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1.A Theoretical Framework for Analyzing Alternative Storage Technologies

This chapter provides the methodological background for the analysis to be carried out in next chapters. Specifically, it first discuss the various criteria that can be adopted in the choice of a storage technology and then summarizes the principles and decision criteria adopted by cost-benefit analysis that is the tool that will be used to evaluate the different alternatives.

1.1.Overview of different decision criteria in technology adoption

Different decision-making processes can lead users and organizations to choose different technologies. Considering only one dimension as evaluation criterion, e.g. technical performance vs. cost, can lead to inappropriate investments or strategies. The various possible criteria that can be used in decision-making, with particular regard to the rural context, are shown below. Each one takes in account a different perspective of assessment and therefore, the choice of the criteria to be adopted is essentially a matter of the objectives of the analysis and, ultimately, of the decision-maker objective function.

Technical performance

Making a choice based only on this criterion is not very common at smallholder level since they are not able to properly size the benefits in terms of avoided post-harvest loss deriving by the adoption of a specific technology[1]. Furthermore, smallholder farmers usually are credit-constraint and don't have enough capital to access the top performing technology. Moreover, understanding information on technical performance of a given technique usually requires medium/high level of education/skills that is often beyond the reach of smallholders. This means that the technical performance criterion fits mostly to institutions and large farmers.

User acceptance

The need to invest in a technology depends on the capacity to handle it and accomplish all the required tasks to achieve the expected performances. These skills are almost universally granted for basic technologies, while for more advanced technologies some form of technical training is required. Especially at smallholder level this is crucial since fully

[1] Usually, smallholders have only a rough idea of the potential benefits of a given technology based on how it can contribute to increase the household food self-sufficiency rate.

understanding of how the technology works and what are the user's tasks to make it work properly increase the technology acceptance and the willingness to invest in it.

Availability

One of the main objectives of the PHM-SSA project is making post-harvest technologies available in the rural areas. The distance between the technology supply point and the point where the technology will be used may represent a limitation to adoption because reaching urban centers to acquire it would mean higher costs (transports) to the final user thus making its less appealing.

In rural areas the situation is exacerbated by the fact that some technologies are not supplied all the year around but only during limited periods according to the farming calendar of more important crops. It is the case of polypropylene bags that are available only during sesame or cotton harvest time (cash crops of higher value than basic food crops such as maize).

Profitability

There are no doubts that profitability, that is a comparison of the benefits expected from the technology adoption and the costs that need to be incurred for adoption – initial investment and recurrent costs – are key to the farmer decision. Although a full-fledged cost-benefit analysis is probably too difficult and costly for small farmers, some form of financial evaluation is nevertheless carried out. The problem is that simplifying the analysis too often means not considering key aspects of the decision. For instance, not considering a proper length of the period over which making the evaluation, not considering discounting and/or differences in the purchasing power. This could lead to biased decisions. Last but not least, considering only costs and benefits does not capture other important dimensions such as user acceptance or technology availability.

Therefore, although a cost-benefit analysis is a key tool that takes in account both the financial aspects of the investment and the technical performances (monetizing the benefits of the adoption of the technology), other criteria need to be considered as well.

1.2.Cost-benefit analysis

Cost-benefit analysis (CBA) is a tool that helps the decision-maker to make a better-informed choice among different options. This method evaluates in monetary terms the expected benefits accruing from a given alternative and compares them to the financial cost of

the investment (European Commission, 2008). Then the "value" of each alternative is compared and a ranking among alternative options is build according to some criteria (see below). It therefore helps in allocating limited resources on the best project.

The simplest way applying a CBA is to evaluate whether it is worthwhile or not to adopt an option. In this case the alternatives to be valued are: "without" intervention scenario or "with" intervention scenario. If the options just differ in benefits – being equal the investment cost – the choice will be directed towards the one generating the largest benefit. However, usually a different investment is required to generate higher benefits: therefore, different costs and benefits has to be accounted for.

In more complicated cases more "with" intervention scenarios has to be compared to the "without" alternative (i.e., the *counterfactual*) assessing the net benefits generated by each alternative.

1.2.1. Methodology

Discount rate

Costs and benefits of a project are usually spanned over a period of many years[2]. This poses the problem of how take into account that the decision-maker has an inter-temporal preference for net benefits accruing earlier, that is the utility of a given amount of money decreases with time.

Discounting is the method used to enable a comparison between benefits and costs occurring at different times through bringing them to the same moment, e.g. the beginning of the project t_0. In order to perform discounting, a proper *discount rate* (*r*) has to be chosen.

Investment criteria

Different criteria may be adopted for comparing costs and benefits and make an investment choice. The most common ones are the net present value, the benefit-cost ratio and the internal rate of return.

The *Net Present Value* (NPV) is the difference between the sum of all discounted benefits – that occur along the analyzed period and properly actualized to the present applying discounting – and the sum of all discounted costs – obtained using the same discounting procedure.

[2]Otherwise, if benefits and costs all occur in one year, net benefit would simply result subtracting costs from benefits.

$$NPV = \sum_{t-1}^{T} \frac{(B_t)}{(1+r)^{t-1}} - \sum_{t-1}^{T} \frac{(C_t)}{(1+r)^{t-1}}.$$

where:

B_t is the benefit at time *t*,

C_t is the cost at time *t*,

r is the discount rate.

The eligibility criterion is to consider only the alternatives with a positive NPV while the selection criterion is to adopt the top-rank alternative, i.e. the one featuring the highest NPV.

The *Benefit-Cost Ratio* (BCR) is calculated by taking the present value of the benefits and dividing it by the present value of the costs:

$$BCR = \sum_{t-1}^{T} \frac{B_t}{(1+r)^{t-1}} \Big/ \sum_{t-1}^{T} \frac{C_t}{(1+r)^{t-1}}$$

The economic meaning of BCR is how many dollars of benefits are produced by one dollar of costs in a given alternative. Therefore, it provides a measure of the efficiency of the use of capital in a given alternative (Cellini & Kee, 2010). From an economic efficiency perspective any program with total discounted benefits exceeding total discounted costs – or with a BCR of better than 1 – can be considered an efficient allocation of resources: this is the eligibility criterion. The selection criterion is to adopt the top-rank alternative, i.e. the one featuring the highest BCR.

The *Internal Rate of Return* (IRR) is the discount ratethat yields total discounted benefits equal to total discounted.The project's IRR needs to be above the benchmark discount rate for the project to be considered viable (Commonwealth of Australia, 2006; Coulter & Schneider, 2004; Coulter & Schneider, 2004).IRR is typically presented as supplementary information to the NPV and BCR (David, Giles, & Susana, 2006). There is general agreement that the IRR should not be used to rank and select mutually exclusive projects (Asian Development Bank,

2013).

2.CBA application to the project

Maize in the North of Mozambique is one of the more cultivated crops and plays a key role in the household food need, both in rural and urban areas. Once covered livelihood needs maize could be traded to generate a family income. For this reason maize in these regions could be considered both as a food and cash crop – although doesn't represent such a high value crop as cotton or sesame.

Maize in Mozambique is only available to be harvested during a single season (starting from May) but the need to consume or sell maize is constant. To enable households to consume or sell during non-harvest period maize must be stored. Storage of maize creates a valuable household asset in the form of maize inventory. This asset produces a cash flow (revenue) to the household when it is sold, and requires a cash flow (expense) to purchase. Both the sale of available maize inventory and purchase of maize are transactions that impact household income (Shelli & Cleopatra, 2013).

At the regional level (Eastern and Southern Africa) estimated post-harvest losses can vary from 2% to 10% in maize stored for over 6 months, up to 30% if the Larger Grain Borer is present (Kimenju & De Groote, 2010). These losses result in reduced maize inventory available for consumption or sale.The reductions in maize storage losses should lead to strengthening of food security and increases in household income.

The increase in household income should come in two ways:

i. Greater surplus available for sale: if the reduction of losses produces an annual household inventory of maize which is greater than the annual household consumption, the surplus maize can be sold producing income to the household.
ii. Reducing household purchases of maize: if the reduction in storage losses produces an annual household inventory of maize which meets the needs of the annual household consumption the household will not need to purchase maize.

To achieve a substantial reduction in maize storage losses the most effective action(APHLIS, 2013) is improving storage conditions. Adopting improved storage technologies has the strongest impact to pursue this goal (CIMMYT, 2011). Clearly, adopting a new storage technology comes at a cost to the farmer. From a financial perspective a

farming household will only adopt a new storage technology if the cost of doing so is less than the financial gain derived. As previously treated the cost-benefit analysis helps in considering these two aspects and provide outcomes to assist the decision-maker in the choice of adoption.

2.1.Methodology

Firstly has to be clarified that the CBA performed in the study is done by a financial perspective, not economic, because doesn't take in account social costs and benefits.

In the methodology performed as benefit is considered the monetary value (MZN-Mozambican Metical) of the available maize stored using a specific technology. As *available* is considered the total amount produced – in one campaign and according to specified farm size and land productivity (scenario) – menus losses occurring during the storage – peculiar of each storage technology.

Therefore once fixed the quantity produced in each scenario the amount of maize available is just dependent on the storage losses rate that consequently derives from the technical performances of the technology.

At this point – to obtain the financial value of the available amount of maize – the quantity has to be multiplied by the unit price. Since the maize market price swings largely along the year the final maize value – assumed as benefit in the CBA – depends on the choice of the sale period.

Those benefits are then compared to the financial costs of acquiring and maintaining the technology. Among the analyzed technologies some have main costs concentrated in the first years – as the metal silo – and others have costs spread all over the full period – as the polypropylene bag.

To cope with these differences among technologies is taken in account a twenty-years period in which the CBA is carried out.

2.1.1.Assessment of benefits

As mentioned above the first step to perform a CBA is to assess and monetize the benefits brought by the adoption of the technology chosen. Since the objective of this study is to evaluate the advantages of the adoption of storage technologies, the economic value of the available stored maize is assumed as benefit of the CBA. The maize available is intended as the total production menus the quantity of maize lost during the storage period.

To calculate the total production is necessary to define the farm size (ha) and land productivity (ton/ha). In this way this information creates different production scenarios that result in different CBA outcomes (choices and features of each scenario are discussed in more detail in the further chapter: *Scenarios Description)*. These data has to be insert in the *Input Table*.

Maize Inventory Analysis – Input Table	
Farm Size (ha)	1
Productivity (ton/ha)	1,2
Total Production (kg)	1200
Storage Losses (%)	2,2
Total Losses (kg)	26,40

Secondly the *Storage Losses* cell has to be filled with the losses rate (%) specific of the technology to be analyzed[3]. The information used in the study is from field-based assessments collected – in the case of the storage losses percentages – by theInstituto de InvestigaçãoAgrária de Mozambique (IIAM) (partner of Helvetas in the PHM-SSA project) wrote in the June of 2015(IIAM, 2016) (The specifics of each technology are dealt in the further chapter: Post-harvest technologies description).The table below represents how much the losses reduce the household maize availability. The final amount is then available for food consumption, trade (to generate income or exchanges) and seeds for the next campaign.

Maize Inventory Analysis (kg)	
Beginning Inventory	1200
Amount Lost	26,40
Ending Inventory	**1173,60**

The red figures of the table above represent the negative items that are subtracted from the total inventory (outflow).

[3] In the tables of the study the input cells to be filled with inputs are blue-colored, to be better distinguishable from the white ones just used as results of the calculations.

Once obtained the amount of maize available has to be calculated the corresponding monetary value – in order to account it as monetary benefit.

Since market prices constantly change during the year (according to the stock locally available) here is just considered a trimestral mean.

As just mentioned the choice to sell maize in a period instead of another strongly influences the ending inventory value. Maize price could rise up to three times between harvest period (May – June) and lean period (sometimes already in August). For this reason is adopted the choice to divide – strongly simplifying – the year in four price periods. The price table is so filled with the trimestral mean of the maize market-gate price.

	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33

Then the total amount of maize is distributed by choosing the percentage sold for each trimester.

Household Income Analysis Input Table					
	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	1173,6	1173,60

The amount of maize addressed to auto-consumption, trading or sowing is not easily estimable. Assuming the *ceteris paribus*[4] rule in the study is supposed that all the production is sold and then can be easily monetized the value of the maize stored.

Refusing to adopt an annual mean of the maize prices helps to better face a key aspect of the study: when farmers choose to sell the maize. This preference is influenced by several factors including psychological, social and economic.With this information is then possible calculating the maize value as final step of the benefits assessment of the CBA.

[4] Ceteris paribus is a Latin phrase meaning 'all other things remaining equal'. A prediction or a statement about a causal, empirical, or logical relation between two states of affairs is *ceteris paribus* if it is acknowledged that the prediction, although usually accurate in expected conditions, can fail or the relation can be abolished by intervening factors (Schlicht, 1985). The concept of ceteris paribus is important in economics because in the real world it is usually hard to isolate all the different variables (Pettinger, 2012).

Household Income Analysis					
	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	total
Amount Sold (kg)	0	0	0	1.173,60	1.173,60
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from sales (MZN)	0	0	0	22.689,60	22.689,60
Household net income (MZN)	**0**	**0**	**0**	**22.689,60**	**22.689,60**

2.1.2. Assessment of costs

The adoption of a technology implies the allocation of money in its acquisition and maintenance. For the acquisition the disbursement is usually in the early moment of the period in analysis – except for the technologies with a short life that has to be rebought cyclically. The maintenance instead enters periodically in the accounting.For some technology are also implied costs due to the acquisition and construction of shelters and protective structures related to the proper handling of the specific technology and thus compulsory linked to the adoption (the specifics of each technologies are shown in the chapter: p*ost-harvest technologies description*).In the table below is represented a shorter period – instead of the twenty years one considered in the full CBA. All figures are expressed in MZN.

Period	0	1	2	3	4	5	6
Year	2016	2017	2018	2019	2020	2021	2022
Actellic Acquisition	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488
Bags Acquisition	-408		-408		-408		-408
Bamboo Strips	-100		-100		-100		-100
Timber	-100		-100		-100		-100
Plastic Cover	-180		-180		-180		-180
Local Labour	-50		-50		-50		-50
Total Cost	**-2.326**	**-1.488**	**-2.326**	**-1.488**	**-2.326**	**-1.488**	**-2.326**

Since all these items are costs they are considered as outflow (negative) and for this reason they are red-colored.

2.1.3.Net present value and benefit-cost ratio calculation

Proceeding with the CBA three basic choices has to be dealt: (i) discount rate, (ii) inflation rate and (iii) length of the period to be analyzed with the CBA.

i. The *discount rate* adopted is 16,25%. The value is the nominal interest rate corresponding to the standing deposit facility of theBank of Mozambique (consulted on the 9th of December 2016)(Banco de Moçambique, 2016).

ii. The *inflation rate* is calculated on the base of the data of the National Institute of Statistics of Mozambique (INE, 2016b), about the province of Nampula. Firstly the annual mean of the monthly Consumer Price Index (CPI) is calculated (for each interested year). Then the difference between the two means is divided by the older year mean, as follows:

$$Inflation\ Rate\ [\%] = \frac{\overline{CPI}_t - \overline{CPI}_{t-n}}{\overline{CPI}_{t-n}} \times 100$$

For example calculating the inflation rate between the years 2014 and 2016 in Nampula:

$$Inflation\ Rate\ [\%] = \frac{\overline{CPI}_{2016} - \overline{CPI}_{2014}}{\overline{CPI}_{2014}} \times 100 = \frac{117{,}08 - 146{,}58}{117{,}08} \times 100 = 25{,}20\%$$

The inflation rate is calculated firstly to adjust prices collected in 2014 to the purchasing power of 2016.

Secondly – assuming the hypothesis of permanence of the current inflation rate – to adjust the supposed future prices considered in the next twenty years taken in account.

Performing a CBA dealing with unadjusted prices could bring to serious misevaluations due to the change of the purchasing power.

iii. The CBA takes in account a period of twenty years. This makes the technology with the longest life (metal silo) comparable with the others.

To compare benefits and costs of a technology is necessary calculate the *Net Benefit* that results from the subtraction between benefit – mentioned in the table as *selling income* – and *total cost.*In the top part of the table the prices (in- and outflows) are expressed as nominal (not adjusted for the inflation). In the bottom instead they are adjusted for the inflation.

Period	0	1	2	3	4	5	6
Year	2016	2017	2018	2019	2020	2021	2022
Nominal Values (unadjusted values)							
Bags Acquisition	-408		-408		-408		-408
Bamboo Strips	-100		-100		-100		-100
Timber	-100		-100		-100		-100
Plastic Cover	-180		-180		-180		-180
Local Labour	-50		-50		-50		-50
Actellic Acquisition	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488
Total Cost	**-2.326**	**-1.488**	**-2.326**	**-1.488**	**-2.326**	**-1.488**	**-2.326**
Selling Income	22.690	22.690	22.690	22.690	22.690	22.690	22.690
Net Benefit	**20.364**	**21.202**	**20.364**	**21.202**	**20.364**	**21.202**	**20.364**
Real Values (annual inflation rate: i=19,46%)							
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063
Adj Cost	-2.326,00	-1.777,56	-3.319,36	-2.536,71	-4.736,96	-3.620,06	-6.759,97
Adj Income	22.689,60	27.105,00	32.379,63	38.680,70	46.207,97	55.200,04	65.941,97
Adj Net Benefit	**20.363,60**	**25.327,43**	**29.060,27**	**36.144,00**	**41.471,01**	**51.579,98**	**59.182,00**

According to the chosen discount rate (r = 16,25%) the adjusted benefits and costs are then actualized to 2016.

Period	0	1	2	3	4	5	6	18	19	
Year	2016	2017	2018	2019	2020	2021	2022	2034	2035	Total
Nominal Values (unadjusted values)										
Total Cost	-2.326	-1.488	-2.326	-1.488	-2.326	-1.488	-2.326	-2.326	-1.488	-38.140
Selling Income	22.690	22.690	22.690	22.690	22.690	22.690	22.690	22.690	22.690	453.792
Net Benefit	**20.364**	**21.202**	**20.364**	**21.202**	**20.364**	**21.202**	**20.364**	**20.364**	**21.202**	**415.652**
Adjusted Values (annual inflation rate: i=19,46%)										
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	24,5474	29,3243	
Adj Cost	-2.326,00	-1.777,56	-3.319,36	-2.536,71	-4.736,96	-3.620,06	-6.759,97	-57.097,21	-43.634,56	-326.991
Adj Income	22.689,60	27.105,00	32.379,63	38.680,70	46.207,97	55.200,04	65.941,97	556.970,29	665.356,70	3.967.860
Adj Net Benefit	**20.363,60**	**25.327,43**	**29.060,27**	**36.144,00**	**41.471,01**	**51.579,98**	**59.182,00**	**499.873,08**	**621.722,14**	**3.640.869**
Actualized Values (discount rate: r=16,25%)										
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,0665	0,0572	
Act Cost	-2.326,00	-1.529,09	-2.456,23	-1.614,70	-2.593,75	-1.705,10	-2.738,97	-3.797,88	-2.496,69	-49.866
Act Income	22.689,60	23.316,13	23.959,95	24.621,56	25.301,43	26.000,07	26.718,01	37.047,48	38.070,47	595.088
Act Benefit	**20.363,60**	**21.787,04**	**21.503,72**	**23.006,86**	**22.707,68**	**24.294,97**	**23.979,04**	**33.249,60**	**35.573,78**	**545.222**

For each technology adopted the costs are distributed in a different pattern (according to how costs of acquisition and maintenance are spread and the length of the lifetime) and thus longer is the period considered more accurate is the analysis. For this reason a twenty-years period is taken in account (that corresponds to the life of the metal silo).

Lastly, the overall monetary benefit of the adoption of a technology results from the sum of all the net benefits actualized to the present: *net present value*.As last indicator the *benefit cost ratio* is calculated dividing the sum of the actualized benefits by the sum of the actualized costs (calculated before for the NPV).

NPV	545.222 MZN
BCR	11,93

2.2.CBA elements description

The structure of the analyses performed in this study is based on a recurring and constant approach (Inventory Analysis, Income Analysis and CBA) that is, however, applied to changing situations. For this reason constant information and assumptions used in the constant methodology are applied to different scenarios (showingset of data recurring in each). In each scenario the technologies – with peculiar data and information – undergo the usual methodology. For this reason it was chosen to present in the beginning the common methodology and then are now descripted the variables: firstly the scenarios, secondly the technologies.

2.2.1. Scenarios description

The objective of the study is to orient decision-makers in the choice of the most suitable technology according to specified socio-economic conditions. Therefore is not possible univocally to rankthe alternatives but they are analyzed and evaluated according to defined patterns of conditions – defined by the inputs previously inserted in the tables. The combinations of inputs produce different scenarios that are then used to test the economic performances of the alternatives.

The inputs involved in shaping the scenarios are the ones already mentioned in the previous chapters, namely: annual farm production and strategic choices of the user.

- The first one defines the farm features and allows calculating the annual production of the household's farm. The inputs requested are: *farm size* (ha) and *productivity* (ton/ha).
  The annual production (ton) of the plot is then easily obtained by the multiplication of the two numbers.
  Since the sizes of the plot are infinitely variable, in the study are chosen three farm extensions: 0,5 ha, 0,75 ha and 1 ha. The measures supposed are widely descriptive of the smallholder's farms sizes – referring to the study areas of the project. It is relevant remember that the study deals just with one crop (maize) and therefore farm size only refers to the area covered by this cultivation. This helps to understand why the sizes of the plots are such apparently scarce.
  About productivity the information come from institutional sources of the district[5]. This data refers to the average productivity of the district and therefore it is applied to all the farms creating three production scenarios:

  - $0{,}5\ \text{ha} \times 1{,}2\ \text{ton/ha} = 600\ \text{kg}$
  - $0{,}75\ \text{ha} \times 1{,}2\ \text{ton/ha} = 900\ \text{kg}$
  - $1\ \text{ha} \times 1{,}2\ \text{ton/ha} = 1.200\ \text{kg}$

  After the definition of the three above situations, the need to create another scenario arose from the evidence that the scenarios created according to the institutional district information were not every time fitting to the field reality. The plot dimensions were properly describing the average sizes but 1,2 ton/ha as productivity was somehow overestimated, since the project deals with rainfed agriculture, with almost null inputs and low farmers' skills. After this consideration was thought to keep the three previous scenarios but add another one assuming a lower productivity: 0,7 ton/ha.

  - $0{,}5\ \text{ha} \times 0{,}7\ \text{ton/ha} = 350\ \text{kg}$

[5] DPA – Direção Provincial de Agricultura (Nampula).

This last scenario – added latterly – allows the study to have a wider view because considers the situation of farmers even smaller than the ones considered before, and thus in even more fragile conditions. The inclusion of this scenario is fundamental for the study since it covers the majority of the cases in the intervention area of the project. In this manner it is possible to split and make more precise the analysis of the ex-wider scenario (i.e. <600 kg).

This lower productivity is not multiplied by all the farm sizes but just with the smallest one (0,5 ha) to don't present production scenarios overlapping but instead add a variable initially out of the range of the study.

- Beyond the setting of the farm production, another input makes possible the definition of the scenarios: the price at which the available maize is sold. This parameter – seen above in the Maize Inventory Analysis – is essential to choose the unit price by which the quantity of available maize is multiplied and thus monetize the benefits to be later compared to the costs.

  Since the sale price of maize changes continuously – according to the period in the maize campaign and consequently the local stock of maize available – the year it is divided in four periods and for each the trimestral mean price is calculated.

  To finalize the calculation of the revenue and monetize the maize stored is thus necessary chose the quantity of maize sold in each trimester assigning a percentage to be sold in each period. The potential choices of how the household may distribute the maize to trade along the year are infinite and so unanalyzable. To solve this issue may be useful notice that the objective of this step of the analysis is to give a monetary value to the stored maize and therefore the issue could be faced finding in which conditions the maize value is maximum and minimum – obviously keeping constant the variable of the total quantity of maize. Since monetizing is done by multiplying quantities by prices, the minimum price obtainable is achieved placing all the maize to be sold in the first – lower price – trimester.

Household Income Analysis Input Table					
	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	1173,6	0	0	0	1173,60

Household Income Analysis					
	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	total
Amount Sold (kg)	1.174	0	0	0,00	1.173,60
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	11.149	0	0	0,00	11.149,20
Household net Income (MZN)	**11.149**	**0**	**0**	**0,00**	**11.149,20**

On the opposite, the maximum value of the same stock of maize results by placing entirely it in the last – higher price – trimester.

Household Income Analysis Input Table					
	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	1173,6	1173,60

Household Income Analysis					
	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	total
Amount Sold (kg)	0	0	0	1.173,60	1.173,60
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	22.689,60	22.689,60
Household net Income (MZN)	**0**	**0**	**0**	**22.689,60**	**22.689,60**

This approach – as previously treated – limits the infinite range of cases to the two extreme ones in order to make more detailed the CBA outcomes and, especially,better fitting to the reality. On the other hand even the excessive simplification of adopting as sale price the annual mean is refused in view of the fact that don't take in account the household behavior and choices about how manage the maize stock.

Including the household choice in the scenarios is crucial to better explain the financial results related to a specific consumer behavior, but even more important is broadly to put in relation a trade choice to a CBA outcome.

Through this methodology is therefore possible to rank the CBA of the technologies not just depending on productive variables but even on consumer-behavioral parameters in

order to provide outcomes better fitting to the field reality.

From now on when in the study the CBA considers the hypothesis of premature selling (first trimester) – thus the lowest household income and worst trade conditions – this scenario is named *worst selling scenario* (WSS). When instead the analysis adopts to sell in the last trimester – referring to the best selling conditions sine the prices are the highest of the year – the scenario is called *best selling scenario* (BSS).

To lastly resume in few words, the household choice about maize selling just swings between two alternatives: Worst Selling Scenario – the least desirable situation as the price is the lowest – and Best Selling Scenario – the most desirable condition since the price is maximum.

Introducing this last variable, the four scenarios initially discussed – based on productive criteria – double, since each one is split in two new scenarios based on the two selling alternatives.This leads to consider eight different values of maize production to be accounted as benefits and then compared to the costs of each technology.

- WSS 0,5 ha × 0,7 ton/ha
- BSS 0,5 ha × 0,7 ton/ha

- WSS 0,5 ha × 1,2 ton/ha
- BSS 0,5 ha × 1,2 ton/ha

- WSS 0,75 ha × 1,2 ton/ha
- BSS 0,75 ha × 1,2 ton/ha

- WSS 1 ha × 1,2 ton/ha
- BSS 1 ha × 1,2 ton/ha

With the approach to organize scenarios is definitively possible to state that the final CBA outcomes reflect the conditions strictly of the chosen scenario and thus provide orientation to households surrounded by specific economic conditions and adopting specific behavior.

2.2.2. Post-harvest technologies description

Once shaped – in the previous chapter – the scenarios in which the different alternatives are analyzed is necessary familiarizing with the variables of each technology that make vary the CBA rankings:

- storage performances;
- costs (acquisition, maintenance and accessory structures).

Therefore to perform successfully the analysis is crucial keep fix conditions – as done in the scenarios – and leave variables that change according to technical features of the technology to pursue the objective of supporting the decision making process.

The technologies analyzed are: *Superbag*, improved granary, polypropylene bag with no treatment, metal silo and polypropylene bag with *Actellic 2%* treatment.

The data on the percentage of storage losses of each technology – calculated as the ratio between the weight of damaged seeds (attacked by insect or with molds) and the total weight of the sample – comes from the report of IIAM (2015).

About the costs the sources are various since for some technology they come from previous studies led by Helvetas (or otherwise partner institutions) for some other they were calculated right for this study (for instance the Metal Silo).

In the costs description treated in each technology chapter it is important notice that not simply the acquisition cost is accounted but even the maintenance (that occurs cyclically) and the construction of accessory structures and tools related to the proper handling of the specific technology and thus compulsory linked to its adoption (such as shelters or rubber to make airtight the metal silos).

The cost of technology is dimensioned on the scenarios and therefore on maize production. This aspect allows the CBA to point out the advantages of an alternative also on the base of the peculiar capacity of each. This situation canbeexemplified through the case of the highest capacity metal silo that would be not advantageous if the maize to be stored is far lower than the full capacity, and if no smaller sizes of the silo are available.

Polypropylene bag with no treatment

Description of the technology

The polypropylene bag without treatment is the more spread storage choice, mainly for itslittle cost. This advantage makes this alterative more affordableto little farmers then other

technologies. Nevertheless a consistent slice of small farmers still doesn't adopt any technology.

The bag is made of polypropylene – a synthetic fiber – instead of the properly called raffia bag that is made of organic fiber. This feature lends the bag a (suggested) lifetime of two years (suggestion rarely accomplished by the users that often leads to storage performances worse than expected).

The direct contact of the bag with the floor and walls has to be avoided to prevent moisture adsorption from the grains. For this reason it is advisable collocate the bag on structures made of bamboo, stones or timber (as pallets for instance) to maintain at least 12 cm of distance from the ground and avoid the contact with the walls. Attention should be paid even to the roof in order to store the bags in a place that could ensure an appropriate protection from the rain (IIAM, 2016).

Storage performance

The percentage of losses of a polypropylene bag is 5,78% (if the properly handling is fulfilled).

Costs description

The bag is available in two sizes of capacity – 50 kg and 100 kg – but since the small one is the most adopted in the study area the 100 kg one is not taken in account in the analysis. The price accounted in the CBA is the sale price adopted by the cooperative involved in the project and designate for retailing it in the rural areas (COOSEN). The price of a 50 kg bag is 17 MZN (December 2016).

For this technology it is also accounted the cost of material and construction of a shelter in order to fully accomplish the recommended handling suggestions above mentioned. These last data were collected and elaborated during the mission of the Helvetas consultant Kurt Schneider(2014). Namely the shelter consists of a structure of bamboo and timber and a plastic sheet as coverage.The figures involved in the calculation of the shelter cost come from the report of Schneider (2014) – adjusted by the 2016 CPI –proportioned to the quantity of grain to be stored. Otherwise if the shelter cost were not proportional the BCR would result more advantageous for the scenarios involving higher grain quantities. In the report – on which this calculations are based – the structure is dimensioned to accommodate five bags. Thus the cost per bag of the structure were calculated and then multiplied by the quantities

ofmaize of each scenario. This procedure was applied in the cost assessment of all the technologies.

All the costs listed above are borne each two years – due to the lifetime of all the materials – as shown in the table below[6].

Period	0	1	2	3		18	19	Total
Year	2016	2017	2018	2019		2034	2035	
Bag Acquisition	-408		-408			-408		
Bamboo Strips	-601		-601			-601		
Timber	-601		-601			-601		
Plastic Cover	-1.082		-1.082			-1.082		
Local Labour	-300		-300			-300		
Tot Cost	-2.992	0	-2.992	0		-2.992	0	-29.921

Polypropylene bag with *Actellic 2%* treatment

Description of the technology

The features of the bag and the accessory structures are the same of the description above – since the container remains polypropylene bag – but with the addition of a chemical treatment for the grains. This treatment consists of mixing a powdery chemical pesticide (*Actellic 2%*) with the maize grains – 25 g of product each 50 kg of maize to be stored – and fill the bags accomplishing the storage recommendations mentioned above.

Storage performance

The percentage of losses with the adoption of this chemical treatment (*Actellic 2%*) decreases to 2,2%.

Costs description

Costs of materials and labor remain the same descripted in the last technology with the addition of the cost of the chemical pesticide. Also here the price accounted is the sale price of the cooperative retailer of the technologies in the project (COOSEN). The cost of a jar containing 25 g of *Actellic 2%* is 310 MZN (December 2016).

[6] From now on the costs of the technologies shown in the example tables provided in the descriptions are dimensioned on a production of 1,2 ton of maize. Costs properly dimensioned on all the production scenarios and actualized to the current inflation rate are provided with in more detail in the CBA tables in the attachments.

As shown in the table below the treatment has to be repeated annually and thus the cost has to be borne each year.

Period	0	1	2	3		18	19	Total
Year	2016	2017	2018	2019		2034	2035	
Bags Acquisition	-408		-408			-408		
Bamboo Strips	-601		-601			-601		
Timber	-601		-601			-601		
Plastic Cover	-1.082		-1.082			-1.082		
Local Labor	-300		-300			-300		
Actellic Acquisition	-1.488	-1.488	-1.488	-1.488		-1.488	-1.488	
Total Cost	**-4.480**	**-1.488**	**-4.480**	**-1.488**		**-4.480**	**-1.488**	**-59.681**

Metal silo

Description of the technology

The metal silo promoted by the PHM-SSA project – and thus manufactured complying features and models standardized – is a container of cylindrical shape with two openings: an inlet on the top to fill the silo and an outlet in the bottom to collect the stored product. The metal silo is a hermetic storage technology if the entrances are closed with a rubber band (easily obtainable by using an air chamber of a bicycle) since all the joints are tin-soldered.

This technology protects against insect attacks and molds if the oxygen presence inside is reduced. This condition is obtainable by fastening a candle under the inlet cover. Once introduced and closed the cover with the rubber band the combustion consumes the oxygen avoiding the spread of pests inside (Besson, 2013a).

Like the other technologies the silo has to be placed under a roof and elevated from the ground to avoid moisture absorption and especially limit the temperature variations.

The models actually under production in the project are: 200 kg, 400 kg, 800 kg and 1000 kg of storage capacity.

The estimated life span of the silo is twenty years.

Storage performance

The losses occurring with the adoption of the metal silo are estimated as 2,04%.

Costs description

The peculiarity of the metal silo is to need a high initial investment but at the same time has a long lifetime, since lasts twenty years. For this reason beyond the high initial expenditure the annual costs are very little and consist of the acquisition of the accessory material to make it hermetic and the structure to elevate it from the ground.

The models manufactured are four and the prices agreed between Helvetas and COOSEN are:

200 kg	2.600 MZN
400 kg	3.200 MZN
800 kg	4.600 MZN
1000 kg	5.300 MZN

The costs borne with the adoption of the metal silo are shown in the table below[7]:

Period	**0**	**1**	**2**	**3**		**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**		**2034**	**2035**	
Silo Acquisition	-7.800	0	0	0		0	0	
Candle Acquisition	-60	-60	-60	-60		-60	-60	
Rubber Acquisition	-1.502	0	-1.502	0		-1.502	0	
Wooden Platform	-601	0	-601	0		-601	0	
Total Cost	**-9.963**	**-60**	**-2.163**	**-60**		**-2.163**	**-60**	**-30.036**

Superbag

Description of the technology

The *Superbag* is a hermetic storage method that consists of a multilayer polyethylene bag. This material prevents the passage of oxygen and moisture allowing a strong reduction of the presence of insects and molds inside. The *Superbag* lends hermeticity to the bag but don't provide any mechanical resistance and for this reason has to be insert in a normal polypropylene or jute bag to be properly protected. Once closed the usual handling and storing recommendations has to be accomplished.

[7] In the example table the costs of the silo is dimensioned – as in the previous cases – on a 1,2 ton production and thus is involved the adoption of two silos of 400 kg and 800 kg. The figures in the *silo acquisition* cells thus contain the cost of acquisition of a 400 kg and 800 kg metal silo.

Storage performance

The percentage of losses estimated using the *Superbag* is 0,83%.

Costs description

Since the lifetime of the *Superbag* is short – due to its peculiar properties – it has to be rebought annually, despite the polypropylene bag that could last two years. All the other accessories have to be renewed each two years.

Period	0	1	2	3		18	19	Total
Year	2016	2017	2018	2019		2034	2035	
Bag Acquisition	-408		-408			-408		
Bamboo Strips	-601		-601			-601		
Timber	-601		-601			-601		
Plastic Cover	-1.082		-1.082			-1.082		
Local Labour	-300		-300			-300		
Superbag Acquisition	-2.400	-2.400	-2.400	-2.400		-2.400	-2.400	
Total Cost	**-5.392**	**-2.400**	**-5.392**	**-2.400**		**-5.392**	**-2.400**	**-77.921**

Improved granary

Description of the technology

It is a granary constructed with local materials such as bamboo and mud. The structure is completely plastered with clay in the floor and in the lateral walls internally and externally. The roof is of straw or even better made with a plastic sheet. One entrance is present to inlet and toremove the grains. The main improvement that this model of granary presents is to be placed 1 m high from the ground to avoid – beyond the moisture adsorption and temperature variances – the attack of mice. To perform it is necessary install conical structures (called skirts) in the pillars at 60 cm of height that prevent the mice climbing up to the granary (IIAM, 2016).

The size – and thus the capacity – varies according to the household necessity and production. The one considered in the costs analysis has a capacity of about 350 kg since can include 6/8 bags of 50 kg.

Storage performance

Through the use of the improved granary the percentage of losses estimated is 10,44%, the highest among the technologies analyzed. This because are mainly involved local materials in a not so efficient way.

Costs description

To assess the costs of the adoption of the improved granary is used the report draft in 2014 by the Helvetas consultant Kurt Schneider (Schneider, 2014). As mentioned above, the model taken in account in the CBA has a capacity of 350 kg. Therefore on the base of the household production is calculated a factor by which the material to construct a standard size granary is multiplied, obtaining an overall estimation of material and costs.

As is shown in the table below all the structure as to be renewed each three years to assure the best performances (Schneider, 2014). The reason is because the granary is completely constructed using organic materials that rapidly deteriorate under tropical conditions such as rain and temperature variation.

Period	**0**	**1**	**2**	**3**	**4**	**5**		**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**		**2034**	**2035**	
Mud	-137			-137				-137		
Timber Strips	-171			-171				-171		
Timber Platform	-343			-343				-343		
Timber Walls	-343			-343				-343		
Timber Roof	-171			-171				-171		
Grass Roof	-120			-120				-120		
Bamboo Antirat	-103			-103				-103		
Labour 10dd	-500			-500				-500		
Tot Cost	**-1.889**	**0**	**0**	**-1.889**	**0**	**0**		**-1.889**	**0**	**-13.220**

3.Results

The tables presented below contain the outcomes of the cost-benefit analyses of the technologies. The results are groupedby scenario and ranked on the leftby BCR and on the right by NPV. This organization of the datasupports in understanding the ranking of the outcomes *inside*each scenario but also allows making comparisons*between* the scenarios to realize if any correlation, similarity, or trend is present.

350 kg WSS

BCR		NPV	
7,60	Improved Granary	72.632 MZN	Metal Silo*
7,28	Polypropylene Bag	70.877 MZN	Polypropylene Bag
6,68	Metal Silo*	67.831 MZN	Improved Granary
3,76	Actellic 2%	62.616 MZN	Actellic 2%
2,92	Superbag	56.834 MZN	Superbag

350 kg BSS

BCR		NPV	
15,48	Improved Granary	161.057 MZN	Metal Silo
14,81	Polypropylene Bag	155.925 MZN	Polypropylene Bag
13,59	Metal Silo	150.896 MZN	Actellic 2%
7,66	Actellic 2%	148.673 MZN	Improved Granary
5,94	Superbag	146.351 MZN	Superbag

600 kg WSS

BCR		NPV	
7,60	Improved Granary	122.657 MZN	Metal Silo
7,28	Polypropylene Bag	121.503 MZN	Polypropylene Bag
6,16	Metal Silo	116.282 MZN	Improved Granary
3,76	Actellic 2%	107.342 MZN	Actellic 2%
2,92	Superbag	97.431 MZN	Superbag

600 kg BSS

BCR		NPV	
15,48	Improved Granary	274.242 MZN	Metal Silo
14,81	Polypropylene Bag	267.301 MZN	Polypropylene Bag
12,53	Metal Silo	258.679 MZN	Actellic 2%
7,66	Actellic 2%	254.868 MZN	Improved Granary
5,94	Superbag	250.888 MZN	Superbag

900 kg WSS

BCR		NPV	
7,60	Improved Granary	190.383 MZN	Metal Silo
7,50	Metal Silo	182.255 MZN	Polypropylene Bag
7,28	Polypropylene Bag	174.422 MZN	Improved Granary
3,76	Actellic 2%	161.013 MZN	Actellic 2%
2,92	Superbag	146.146	Superbag

900 kg BSS

BCR		NPV	
15,48	Improved Granary	417.760 MZN	Metal Silo
15,26	Metal Silo	400.951 MZN	Polypropylene Bag
14,81	Polypropylene Bag	388.019 MZN	Actellic 2%
7,66	Actellic 2%	382.302 MZN	Improved Granary
5,94	Superbag	376.331 MZN	Superbag

1200 kg WSS

BCR		NPV	
8,01	Metal Silo	256.309 MZN	Metal Silo
7,60	Improved Granary	243.006,62 MZN	Polypropylene Bag
7,28	Polypropylene Bag	232.563 MZN	Improved Granary
3,76	Actellic 2%	214.684 MZN	Actellic 2%
2,92	Superbag	194.861 MZN	Superbag

1200 kg BSS

BCR		NPV	
16,29	Metal Silo	559.478 MZN	Metal Silo
15,48	Improved Granary	534.601 MZN	Polypropylene Bag
14,81	Polypropylene Bag	517.358 MZN	Actellic 2%
7,66	Actellic 2%	509.736 MZN	Improved Granary
5,94	Superbag	501.775 MZN	Superbag

Firstly has to be noticed that all the technologies in all the scenarios have a positive NPV and a BCR higher than one.This means that – according to the eligibility criteria stated in the beginning – all the technologies are financially acceptable. Nevertheless, it is relevant to notice that this doesn't mean that the net benefit is positive in every year of the CBA. This is a weakness of the NPV and BCR as investment analysis tools. This is what happens in the case of the metal silo in the 350 kg WSS and for this reason the technology was marked witha red asterisk (*). As shown in the table below, the net benefit of the first year of the CBA is

negativebecause the income resulting from the maize sale is particularly low (because it is entirely sold in the first trimester and the maize production is scarce).

Period	0	1	2	3	18	19	Total
Year	2016	2017	2018	2019	2034	2035	
Nominal Values (unadjusted values)							
Silo Acquisition	-3.200	0	0	0	0	0	
Candle Acquisition	-20	-20	-20	-20	-20	-20	
Rubber Acquisition	-501	0	-501	0	-501	0	
Wooden Platform	-200	0	-200	0	-200	0	
Tot Cost	**-3.921**	**-20**	**-721**	**-20**	**-721**	**-20**	**-10.612**
Selling Income	3.257	3.257	3.257	3.257	3.257	3.257	65.143
Net Benefit	**-664**	**3.237**	**2.536**	**3.237**	**2.536**	**3.237**	**54.532**
Adjusted Values (annual inflation rate: i=19,46%)							
Adj Cost	-3.921,15	-23,93	-1.029,13	-34,15	-17.702,39	-587,42	-62.572
Adj Income	3.257,17	3.891,02	4.648,21	5.552,75	79.955,00	95.514,24	569.600
Adj Net Benefit	**-663,98**	**3.867,09**	**3.619,07**	**5.518,60**	**62.252,60**	**94.926,82**	**507.028**
Actualized Values (discount rate: i=16,25%)							
Act Cost	-3.921,15	-20,59	-761,53	-21,74	-1.177,49	-33,61	-12.794
Act Income	3.257,17	3.347,11	3.439,53	3.534,51	5.318,29	5.465,15	85.427
Act Benefit	**-663,98**	**3.326,52**	**2.678,01**	**3.512,77**	**4.140,80**	**5.431,54**	**72.632**

This negativeeffect – that emerges only in this scenario of this technology – doesn't appear if only the NPV and the BCR are inspected. The reason of the weakness is that the NPV is the sum of the net benefits and it results positive even if some negative figure is present.

Beyond analyzing singularly the technologies, the role of the study is to put in relation the CBA outcomes throughthe creation of rankings and then analyzing – if present – the trends. This willsuggest to the decision-makerswhich technologies are preferable in specific conditions.

From a first sight emerges that in all the scenarios theranking by BCR differs from the one by NPV. The reason is that the two outcomes have a different meaning and describe different economic aspects of the investment (see below).

Focusing on the BCRs, the values vary from the BSSs to the WSSs. Nevertheless it is important to underline that the BCR of each technology don't change with the variation of the maize to be stored. The values are thereforerespectively constantinside the BSSs and the WSSs and consequently also the ranking inside them doesn't change.The only exception is for the BCR of the metal silo that varies also according to the maize production. For this reason the rankings of the last two scenarios (900 kg and 1200 kg) looks likechanged.Actually –

since the values of the other technologies don’t change – only the metal silo goes up. It occupies the third position in the 350 kg and 600 kg scenarios, goes in the second one in the 900 kg scenario, and reaches the top in the 1200 kg one.

Regarding the NPV the situation is more complex because for each technology is different. Firstly it is notable that for each technology – fixed the amount of maize – the NPV is higher in the BSSthan in therespective WSS. Secondly, on the contrary of the BCR, the NPV increase with the amount of maize to be stored. Even though the values change in each scenario itis observable that the ranking remains the same, respectively inside the BSSs and WSSs,don’t changing with the quantity of maize. As just stated, the ranking is not the same between the WSSs and BSSs. In particular in the WSSs the improved granary occupies the third position and the *Actellic 2%* the fourth one. In the BSSs the contrary appears. This is the only difference that appears studying the NPV trend. The others positions are constant in all the eight scenarios, namely: the metal silo show the higher NPV followed by the polypropylene bag; the *Superbag* permanently occupies the last position.

Analyzing the table, the ranking by NPV don’t correspond to the one by BCRand thus it isnot possible univocallyto choose the best technology by a financial point of view. The study of the trends – and how the outcomes vary with the scenarios – it is thereforecritical to understand which parameters influence the financial convenience.

4.Discussion

The NPVs and BCRs show that all the alternatives are financially acceptable – according to the eligibility criteria. This means that the adoption of each technology is economically viable to pursue the objective of reducing post-harvest losses at household level.

But the above-mentioned case of the metal silo in the 350 kg WSS partiallycontradicts what just affirmed.Unlike to all the other technologies, in that CBAthe net benefit of one year is negative (the first one). This situation means that – to acquire the technology – the user gets in debt. If the maize farming is the main livelihood strategy – as it often occurs – this situation has to be avoided. To turn this technology financiallyacceptable,even in theseconditions, a financingmay be planned – to provide a loan that reduces the investment load borne by the user in the first year. If evaluatedwith a CBA the acquisition of a silo with a financing would for sure result less profitable than the respective "without" financing scenario. This because the interest of the loan would be added to the costs already accounted, maintaining unvaried the benefits. The financing may be not involved if other sources of income –beyond the maize farming – are present [8].

Starting to understand how the CBA outcomes vary, or remain, along the scenarios, the first interestingevidence is that the BCR of each technology don't changewith the variation of maize stored (with the exception of the metal silo that will be further analyzed).A difference is instead evidentbetween the WSS and the BSS. As a consequence, even the BCR ranking respectively inside the WSSs and the BSSs doesn't change.

The reason of this is because the cost of each technology is proportional to its capacity and therefore to the grains to be stored. Obviously, even the benefits are proportional to the quantity of maize stored, since the monetary value is obtained multiplying quantity by unit price. This means that the ratio between costs and benefits – and thus the economic efficiency of the technology – isindependent of the quantity of grain.

The metal silo BCR doesn't follow this rule and changes with the quantity of grain. It happens because the silo capacity is not perfectly proportional to the volume of grains to be stored – as it happens with all the others technologies. The reason is because the silos are

[8] The study assumes the maize production as the unique source of income of the CBA. This choice is obviously a simplification but performing a CBA multiple-crops based would have been far more complex and probably with the same results.

available only in standard sizes that don't always perfectly fit with the grain quantity to be stored.So in this study the silos are not 100% filled in every scenario and thus not always used with the 100% of their efficiency. In the specific the sizes available are: 200 kg, 400 kg, 800 kg, and 1000 kg. In the 350 kg scenarios the silo of 400 kg of capacity is involved, filled bythe 87,5%; in the 600 kg scenarios it is utilized the 800 kg silo[9], filling the 75% of its capacity; in the 900 kg scenarios it is utilized the 1000 kg silo, filled by the 90%; and finally, in the 1200 kg scenario are utilized the 400 kg and 800 kg silos[10], reaching the 100% of it filled. These percentages show the efficiency of use of the silo. These different efficiencies allow understanding why the silo is the only technology in which the BCR isproportional to the maize stored: because the BCR is influenced by the efficiency of use. The capacity of the other technologies fits always perfectly with the quantity of maize to be stored and so they are filled in each scenario by the 100% of their volume. This is why they don't vary in the different scenarios with the quantity of grain.Lastly, it's therefore reasonable todeduce that this is the reason why the silo BCR rises with the efficiency of use, as shown in the table:

	WSS	BSS
%filled	BCR	
75,0%	6,16	12,53
87,5%	6,68	13,59
90,0%	7,5	15,26
100,0%	8,01	16,29

This last consideration makes understand the importance of the technology capacitymatching with the quantity of grain stored. In particular it's clear that the efficiency of filling is a crucial parameter in the overall financial efficiency of the technology.

To further reinforce this hypothesis another analysis was carried out. It was created a new 400 kg BSS – which is thequantity of maize to perfectly fill one of the standard sizes. Since the silo is filled by 100% - and so used by 100% of efficiency – the BCR should result higher than in the scenarios with silos not fully filled. The BCRin this scenario is 15,53: higher than the others but lower than the 1200 kg BSS (that is 100% filled as well).

[9] Because the acquisition cost of the 200 kg and 400 kg model (perfectly fitting with the grain quantity) would have been higher than acquiring only one silo, even though slightly bigger.

[10] Even in this case it is the cheapest combination – instead of adopting the 1000 kg and 200 kg.

This last consideration confirms that efficiency of use and BCR are strictly related but, at the same time, imply a new question: why the same technology filled with the same efficiency shows two different BCRs? To answer to this question has to be involved the concept of *economies of scale*[11].In the case of the metal silo this economic concept is expressedby the prices of the different modelsincreasing much less in proportion to the increasing of the size.Calculating the price per kg stored it appears that it lowers with the increasing of the silo size, as shown in the table below:

Silo Price		
Size	**Price**	**MZN/kg**
200 kg	2.600 MZN	13,0
400 kg	3.200 MZN	8,0
800 kg	4.600 MZN	5,8
1000 kg	5.300 MZN	5,3

This explains why – in the above-mentioned case – the BCR of the 1200 kg scenario is higher than in the 400 kg one. Because per unit of grain stored – being both 100% filled – the cost is lower in the bigger size silo and therefore the investment more efficient.

The efficiency of filling and the price per kg help to understand by which parameters the BCR of the metal silo is influenced.To make more effective – and simply – the analysis, can be created a unique index combining these two pieces of information. Namely, the price per kg can be divided by the efficiency of filling, as follows:

$$Index\ [MZN/kg] = \frac{price\ per\ kg\ [MZN/kg]}{filling\ efficency\ [\%]}$$

[11]Moore (1959) describes economies of scale as 'the cost advantages that enterprises obtain due to size, output, or scale of operation, with cost per unit of output generally decreasing with increasing scale as fixed costs are spread out over more units of output'.

In this way if the silo is 100% filled the price per kg doesn't change. On the contrary, in case of incomplete filling the price per kg rises (e.g. price per kg: 5,8 MZN/kg; filling efficiency: 90%; resulting index: 6,4 MZN/kg). The table below shows the results[12]:

Scenario	Silo	Filling Efficiency	MZN/kg	MZN/kg
350 kg	400 kg	88%	13	14,9
600 kg	800 kg	75%	8	10,7
900 kg	1000 kg	90%	5,8	6,4
1200 kg	400 kg + 800 kg	100%	6,5	6,5

This focus on how the silo features influence the financial efficiency of this technology makes definitively understand why its BCR goes up and reaches the top of the ranking in the last scenarios.

Once demonstrated why the BCR remains the same independently of the quantity of maize – metal silo excepted – has to be explicated why the BCR changes between WSS and BSS, kept constant the maize quantity. Getting back to the BSS and the WSS definitions they represent twosale prices of the same quantity of maize. Namely: one low reflecting the maize value in the harvest period (WSS) and one highreflecting the value in the lean period (BSS). Thus, fixed the quantity of maize – and therefore fixed the costs of the technology –the monetary value of the grain stored in it changes just according to the WSS and the BSS. As a consequence of it also the income and the benefit accounted in the CBA varies. This allows clarifying why, considering the same quantity of maize, the BCR in the WSS is lower than in the BSS. What just performed is a sensitivity analysis that demonstrates theindependence of the BCR from the quantity of maizeand from the value of the maize itself, since the rankings don't change with the scenarios.

Getting back to the inversely proportional relation between the BCR of the silo andits filling efficiency, it is demonstrate that the financial efficiency is lower in the scenarios in which the silo is not 100% filled than in the completely filled ones. This makes understand that the silo BCR, unlike the others, is thus influenced by a variable external to the characteristics of the technology, i.e. the scenario. It therefore follows that in the scenarios in which the quantity of maize doesn't fill the 100% of the volume the silo is disadvantaged – by the financial efficiency point of view – compared to the other technologies. To remove this

[12] In the 1200 kg scenario are involved two silos. In this case the price per kg is calculated summing the price of the two silos divided by the final volume.

exogenous variable, disadvantaging the silo in some scenario, may be thought to take in account only the BCR rankings of the 1200 kg scenarios. In this way all the technologies may be compared on an equal footing, i.e. the 100% of the filling efficiency reached. This suggestion of analysis may result acceptable as it was demonstrated that the BCR of the other technologies is not affected by the quantity of maize stored and therefore by the scenario chosen. Furthermore, the analysis of the BCR ranking in the 1200 kg scenarios can be performedboth in the WSS and in the BSS, i.e. independently of the maize value, because the ranking between them doesn't change.

By these last considerations can be finally stated that the ranking of the technologies by financialefficiency (from the top downwards) is: metal silo, improved granary, polypropylene bag and *Actellic 2%*, and*Superbag*.

Themeaning of the NPV as investment criterionis far different from the BCR. The former is a difference between the discounted benefits and the discounted costs. The latter, instead, is a ratio – also between benefits and costs.To clarify, the cost of adoption of a technology increases with the quantity of grain considered in each scenario. Proportionally to the BCR, even the benefits increase with the costs. As a consequence of it the difference between them increase, i.e. the NPV. For this reason – as just shown – the NPV, unlike the BCR that is constant, rises with the quantity of maize stored. The reason why, left constant the quantity of maize, the NPV of each technology is higher in the BSSthan in the WSS is the same of theBCR. The monetary value of the maize is higher in the BSS than in the WSS and so even the benefits in the CBA are higher in the former and lower in the latter. As the cost of the technology doesn't vary, the difference between costs and benefits – i.e. the NPV – is higher in the BSSs than in the respective WSSs.

From this analysis appears that the NPV is a useful investment criterion but with the weakness of not considering the initial investment cost and so the limited resources of the household. To clarify with simpler figures let's consider this example. The alternative A:implying10 MZN ofactualized costs, and 20 MZN of actualizedbenefits. The alternative B, instead: with 1 MZN of actualized costs, and 4 MZN of actualized benefits. The NPV_A is 10 MZN and the BCR_A is 2. The NPV_B is 3 MZN and the BCR_B is 4. The user adopting the alternative A earns more – just looking at the benefits dimension – than adopting the alternative B (10 MZN vs. 3 MZN)but the NPV don't take in account the size of the investment borne in the case A, that actuallyis ten times higher than in the case B (10 MZN

vs. 1 MZN). In case of limited financial resources only the BCR makes understand which is the alternative that invest more efficiently the capital. Getting back to the example, investing one metical (MZN) in the alternative B it is twice more efficient than investing in the alternative A(4 vs. 2). This makes understand that NPV can be a useful investment criterion if the resources to be invested are unlimited. Unfortunately this condition is far from the situation of the families in rural areas, especially if in LDC. Therefore the BCR is the most suitable criterion toanswer to the need of addressing credit-constrained families in the most efficient investment. According to what stated in the BCRs analysis the metal silo results as the best technology in which invest– by the financial efficiency point of view. This affirmation is also supported by the NPV rankings in which the metal silo appears in the top position of each scenario. On the contrary the *Superbag* appears the worst alternative in which invest being positioned in the last place of all the rankings, both by BCR and NPV. For the other technologies the ranking changesdepending whether the investment criterion adopted is the efficiencyor the profit.As the BCR is suggested as the most suitable investment criterion, the ranking among them thus results (from the top downwards): improved granary, polypropylene bag, and *Actellic 2%*.

Appendix 1 – CBA spreadsheets of the scenarios

CBA Polypropylene Bag + Actellic 2%

Total Production (kg) **350**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	0,7
Total Production (kg)	**350**
Storage Losses (%)	2,20%
Total Losses (kg)	**7,70**

Maize Inventory Analysis (kg)	
Beginning Inventory	350
Amount Lost	7,70
Ending Inventory	**342,30**

Household Income Analysis Input Table					
	May-Jul	**Aug-Oct**	**Nov-Jan**	**Feb-Apr**	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	342,3	0	0	0	342,30
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	342,30	0,00	0,00	0,00	342,30
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	3252	0	0	0,00	3.251,85
Household net income (MZN)	**3252**	**0**	**0**	**0,00**	**3.251,85**

CBA Polypropylene Bag + Actellic 2%

Total Production (kg) **350**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
Acquisition Price (MZN)	17
Bag Capacity (kg)	50
n° bags	7
Tot Cost Bags	119

Actellic 2%		
Actellic Cost/unit	310	*Actellic Bottle: 125g/unit*
Actellic Cost/g	2,48	
Actellic Need (g)	175	*Actellic Dose: 25g/50kg grains*
Tot Actellic Expenditure	434	

Accessory Costs	
Inflation Rate 2014-2016	25,20%

	cost/bag	final cost
	2014	**2016**	
Bamboo Strip	20	25,04	175,28
Timber	20	25,04	175,28
Plastic Cover	36	45,07	315,504
Local Labor	10	12,52	87,64

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bags Acquisition	-119		-119		-119		-119		-119		-119		-119		-119		-119		-119		
Bamboo Strips	-175		-175		-175		-175		-175		-175		-175		-175		-175		-175		
Timber	-175		-175		-175		-175		-175		-175		-175		-175		-175		-175		
Plastic Cover	-316		-316		-316		-316		-316		-316		-316		-316		-316		-316		
Local Labor	-88		-88		-88		-88		-88		-88		-88		-88		-88		-88		
Actellic Acquisition	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	
Total Cost	**-1.307**	**-434**	**-1.307**	**-434**	**-1.307**	**-434**	**-1.307**	**-434**	**-1.307**	**-434**	**-1.307**	**-434**	**-1.307**	**-434**	**-1.307**	**-434**	**-1.307**	**-434**	**-1.307**	**-434**	**-17.407**
Selling Income	3.252	3.252	3.252	3.252	3.252	3.252	3.252	3.252	3.252	3.252	3.252	3.252	3.252	3.252	3.252	3.252	3.252	3.252	3.252	3.252	65.037
Net Benefit	**1.945**	**2.818**	**1.945**	**2.818**	**1.945**	**2.818**	**1.945**	**2.818**	**1.945**	**2.818**	**1.945**	**2.818**	**1.945**	**2.818**	**1.945**	**2.818**	**1.945**	**2.818**	**1.945**	**2.818**	**47.630**
Adjusted Values (annual Inflation Rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-1.306,70	-518,46	-1.864,76	-739,87	-2.661,14	-1.055,85	-3.797,63	-1.506,77	-5.419,48	-2.150,27	-7.733,97	-3.068,58	-11.036,91	-4.379,07	-15.750,43	-6.249,24	-22.476,95	-8.918,10	-32.076,16	-12.726,75	-145.437
Adj Income	3.251,85	3.884,66	4.640,61	5.543,68	6.622,48	7.911,21	9.450,73	11.289,85	13.486,85	16.111,39	19.246,67	22.992,07	27.466,33	32.811,28	39.196,35	46.823,96	55.935,91	66.821,03	79.824,41	95.358,23	568.670
Adj Net Benefit	**1.945,15**	**3.366,20**	**2.775,86**	**4.803,81**	**3.961,34**	**6.855,36**	**5.653,11**	**9.783,08**	**8.067,38**	**13.961,13**	**11.512,70**	**19.923,49**	**16.429,42**	**28.432,20**	**23.445,92**	**40.574,72**	**33.458,95**	**57.902,93**	**47.748,24**	**82.631,49**	**423.232**
Actualized Values (discount rate: r=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-1.306,70	-445,98	-1.379,86	-470,95	-1.457,12	-497,32	-1.538,70	-525,17	-1.624,85	-554,57	-1.715,82	-585,62	-1.811,89	-618,41	-1.913,33	-653,03	-2.020,46	-689,59	-2.133,58	-728,20	-22.671
Act Income	3.251,85	3.341,64	3.433,92	3.528,74	3.626,17	3.726,30	3.829,20	3.934,93	4.043,59	4.155,24	4.269,98	4.387,89	4.509,05	4.633,56	4.761,50	4.892,98	5.028,09	5.166,93	5.309,61	5.456,22	85.287
Act Benefit	**1.945,15**	**2.895,66**	**2.054,05**	**3.057,78**	**2.169,05**	**3.228,98**	**2.290,50**	**3.409,77**	**2.418,74**	**3.600,67**	**2.554,16**	**3.802,27**	**2.697,16**	**4.015,15**	**2.848,17**	**4.239,95**	**3.007,63**	**4.477,34**	**3.176,03**	**4.728,02**	**62.616**

NPV	62.616 MZN
BCR	3,76

CBA – Polypropylene Bag + Actellic 2%

Total Production (kg) **350**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	0,7
Total Production (kg)	**350**
Storage Losses	2,20%
Total Losses (kg)	**7,70**

Maize Inventory Analysis (kg)	
Beginning Inventory	350
Amount Lost	7,70
Ending Inventory	**342,30**

Household Income Analysis Input Table					
	May-Jul	**Aug-Oct**	**Nov-Jan**	**Feb-Apr**	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	342,3	342,30
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	342,30	342,30
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	6.617,80	6.617,80
Household net income (MZN)	**0**	**0**	**0**	**6.617,80**	**6.617,80**

CBA Polypropylene Bag + Actellic 2%

Total Production (kg) **350**

Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
Acquisition Price (MZN)	17
Bag Capacity (kg)	50
n° bags	7
Total Cost Bags	119

Actellic 2%		
Actellic Cost/unit	310	*Actellic Bottle: 125g/unit*
Actellic Cost/g	2,48	
Actellic Need (g)	175	*Actellic Dose: 25g/50kg grains*
Total Actellic Expenditure	434	

Accessory Costs	
Inflation Rate 2014-2016	25,20%

	cost/bag	final cost
	2014	**2016**
Bamboo Strips	20	25,04	175,28
Timber	20	25,04	175,28
Plastic Cover	36	45,07	315,504
Local Labor	10	12,52	87,64

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bags Acquisition	-119		-119		-119		-119		-119		-119		-119		-119		-119		-119		
Bamboo Strips	-175		-175		-175		-175		-175		-175		-175		-175		-175		-175		
Timber	-175		-175		-175		-175		-175		-175		-175		-175		-175		-175		
Plastic Cover	-316		-316		-316		-316		-316		-316		-316		-316		-316		-316		
Local Labor	-88		-88		-88		-88		-88		-88		-88		-88		-88		-88		
Actellic Acquisition	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	-434	
Total Cost	**-1.307**	**-434**	**-1.307**	**-434**	**-1.307**	**-434**	**-1.307**	**-434**	**-1.307**	**-434**	**-1.307**	**-434**	**-1.307**	**-434**	**-1.307**	**-434**	**-1.307**	**-434**	**-1.307**	**-434**	**-17.407**
Selling Income	6.618	6.618	6.618	6.618	6.618	6.618	6.618	6.618	6.618	6.618	6.618	6.618	6.618	6.618	6.618	6.618	6.618	6.618	6.618	6.618	132.356
Net Benefit	**5.311**	**6.184**	**5.311**	**6.184**	**5.311**	**6.184**	**5.311**	**6.184**	**5.311**	**6.184**	**5.311**	**6.184**	**5.311**	**6.184**	**5.311**	**6.184**	**5.311**	**6.184**	**5.311**	**6.184**	**114.949**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-1.306,70	-518,46	-1.864,76	-739,87	-2.661,14	-1.055,85	-3.797,63	-1.506,77	-5.419,48	-2.150,27	-7.733,97	-3.068,58	-11.036,91	-4.379,07	-15.750,43	-6.249,24	-22.476,95	-8.918,10	-32.076,16	-12.726,75	-145.437
Adj Income	6.617,80	7.905,62	9.444,06	11.281,87	13.477,32	16.100,01	19.233,07	22.975,83	27.446,93	32.788,10	39.168,66	46.790,88	55.896,39	66.773,83	79.768,01	95.290,87	113.834,47	135.986,66	162.449,67	194.062,37	1.157.292
Adj Net Benefit	**5.311,10**	**7.387,17**	**7.579,30**	**10.542,00**	**10.816,19**	**15.044,16**	**15.435,45**	**21.469,06**	**22.027,45**	**30.637,83**	**31.434,70**	**43.722,30**	**44.859,48**	**62.394,75**	**64.017,59**	**89.041,63**	**91.357,52**	**127.068,56**	**130.373,50**	**181.335,62**	**1.011.855**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-1.306,70	-445,98	-1.379,86	-470,95	-1.457,12	-497,32	-1.538,70	-525,17	-1.624,85	-554,57	-1.715,82	-585,62	-1.811,89	-618,41	-1.913,33	-653,03	-2.020,46	-689,59	-2.133,58	-728,20	-22.671
Act Income	6.617,80	6.800,54	6.988,32	7.181,29	7.379,58	7.583,35	7.792,75	8.007,93	8.229,06	8.456,28	8.689,79	8.929,74	9.176,31	9.429,70	9.690,08	9.957,65	10.232,61	10.515,16	10.805,52	11.103,89	173.567
Act Benefit	**5.311,10**	**6.354,55**	**5.608,46**	**6.710,33**	**5.922,46**	**7.086,03**	**6.254,05**	**7.482,77**	**6.604,20**	**7.901,72**	**6.973,96**	**8.344,12**	**7.364,42**	**8.811,29**	**7.776,74**	**9.304,62**	**8.212,15**	**9.825,57**	**8.671,94**	**10.375,69**	**150.896**

NPV	150.896 MZN
BCR	7,66

CBA Polypropylene Bag + Actellic 2%

Total Production (kg) **600**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	1,2
Total Production (kg)	**600**
Storage Losses	2,20%
Total Losses (kg)	**13,20**

Maize Inventory Analysis (kg)	
Beginning Inventory	600
Amount Lost	13,20
Ending Inventory	**586,80**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	586,8	0	0	0	586,80
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	586,80	0,00	0,00	0,00	586,80
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from sales (MZN)	5575	0	0	0,00	5.574,60
Household net income (MZN)	**5575**	**0**	**0**	**0,00**	**5.574,60**

CBA Polypropylene Bag + Actellic 2%

Total Production (kg) **600**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
Acquisition Price (MZN)	17
Bag Capacity (kg)	50
n° bags	12
Total Cost Bags	204

Actellic 2%		
Actellic Cost/unit	310	*Actellic Bottle: 125g/unit*
Actellic Cost/g	2,48	
Actellic Need (g)	300	*Actellic Dose: 25g/50kg grains*
Total Actellic Expenditure	744	

Accessory Costs	
Inflation Rate 2014-2016	25,20%

cost/bag		final cost
	2014	**2016**
Bamboo Strip	20	25,04	300,48
Timber	20	25,04	300,48
Plastic Cover	36	45,07	540,864
Local Labor	10	12,52	150,24

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bags Acquisition	-204		-204		-204		-204		-204		-204		-204		-204		-204		-204		
Bamboo Strips	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Timber	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Plastic Cover	-541		-541		-541		-541		-541		-541		-541		-541		-541		-541		
Local Labor	-150		-150		-150		-150		-150		-150		-150		-150		-150		-150		
Actellic Acquisition	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	
Total Cost	**-2.240**	**-744**	**-2.240**	**-744**	**-2.240**	**-744**	**-2.240**	**-744**	**-2.240**	**-744**	**-2.240**	**-744**	**-2.240**	**-744**	**-2.240**	**-744**	**-2.240**	**-744**	**-2.240**	**-744**	**-29.841**
Selling Income	5.575	5.575	5.575	5.575	5.575	5.575	5.575	5.575	5.575	5.575	5.575	5.575	5.575	5.575	5.575	5.575	5.575	5.575	5.575	5.575	111.492
Net Benefit	**3.335**	**4.831**	**3.335**	**4.831**	**3.335**	**4.831**	**3.335**	**4.831**	**3.335**	**4.831**	**3.335**	**4.831**	**3.335**	**4.831**	**3.335**	**4.831**	**3.335**	**4.831**	**3.335**	**4.831**	**81.651**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-2.240,06	-888,78	-3.196,73	-1.268,35	-4.561,95	-1.810,03	-6.510,22	-2.583,04	-9.290,53	-3.686,17	-13.258,23	-5.260,42	-18.920,41	-7.506,99	-27.000,73	-10.712,99	-38.531,91	-15.288,17	-54.987,71	-21.817,28	-249.321
Adj Income	5.574,60	6.659,42	7.955,34	9.503,45	11.352,82	13.562,08	16.201,26	19.354,02	23.120,32	27.619,53	32.994,29	39.414,98	47.085,14	56.247,90	67.193,75	80.269,65	95.890,12	114.550,34	136.841,84	163.471,26	974.862
Adj Net Benefit	**3.334,54**	**5.770,63**	**4.758,61**	**8.235,09**	**6.790,87**	**11.752,05**	**9.691,04**	**16.770,99**	**13.829,79**	**23.933,36**	**19.736,06**	**34.154,56**	**28.164,73**	**48.740,92**	**40.193,01**	**69.556,66**	**57.358,21**	**99.262,17**	**81.854,13**	**141.653,98**	**725.541**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-2.240,06	-764,54	-2.365,48	-807,35	-2.497,92	-852,55	-2.637,77	-900,28	-2.785,46	-950,69	-2.941,41	-1.003,92	-3.106,10	-1.060,12	-3.280,00	-1.119,48	-3.463,64	-1.182,16	-3.657,57	-1.248,34	-38.865
Act Income	5.574,60	5.728,53	5.886,71	6.049,26	6.216,30	6.387,95	6.564,34	6.745,60	6.931,87	7.123,27	7.319,97	7.522,09	7.729,80	7.943,24	8.162,58	8.387,97	8.619,59	8.857,60	9.102,18	9.353,52	146.207
Act Benefit	**3.334,54**	**4.963,99**	**3.521,23**	**5.241,91**	**3.718,38**	**5.535,40**	**3.926,56**	**5.845,31**	**4.146,41**	**6.172,58**	**4.378,56**	**6.518,18**	**4.623,70**	**6.883,12**	**4.882,58**	**7.268,49**	**5.155,94**	**7.675,44**	**5.444,62**	**8.105,18**	**107.342**

NPV	107.342 MZN
BCR	3,76

CBA Polypropylene Bag + Actellic 2%

Total Production (kg) **600**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	1,2
Total Production (kg)	**600**
Storage Losses (%)	2,20%
Total Losses (kg)	**13,20**

Maize Inventory Analysis (kg)	
Beginning Inventory	600
Amount Lost	13,20
Ending Inventory	**586,80**

Household Income Analysis Input Table					
	May-Jul	**Aug-Oct**	**Nov-Jan**	**Feb-Apr**	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	586,8	586,80
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	586,80	586,80
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	11.344,80	11.344,80
Household net Income (MZN)	**0**	**0**	**0**	**11.344,80**	**11.344,80**

CBA Polypropylene Bag + Actellic 2%

Total Production (kg) **600**

Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
Acquisition Price (MZN)	17
Bag Capacity (kg)	50
n° bags	12
Tot Cost Bags	204

Actellic 2%		
Actellic Cost/unit	310	*Actellic Bottle: 125g/unit*
Actellic Cost/g	2,48	
Actellic Need (g)	300	*Actellic Dose: 25g/50kg grains*
Tot Actellic Expenditure	744	

Accessory Costs	
Inflation Rate 2014-2016	25,20%

	cost/bag	final cost
	2014	**2016**
Bamboo Strip	20	25,04	300,48
Timber	20	25,04	300,48
Plastic Cover	36	45,07	540,864
Local Labor	10	12,52	150,24

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bags Acquisition	-204		-204		-204		-204		-204		-204		-204		-204		-204		-204		
Bamboo Strips	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Timber	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Plastic Cover	-541		-541		-541		-541		-541		-541		-541		-541		-541		-541		
Local Labor	-150		-150		-150		-150		-150		-150		-150		-150		-150		-150		
Actellic Acquisition	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	-744	
Total Cost	**-2.240**	**-744**	**-2.240**	**-744**	**-2.240**	**-744**	**-2.240**	**-744**	**-2.240**	**-744**	**-2.240**	**-744**	**-2.240**	**-744**	**-2.240**	**-744**	**-2.240**	**-744**	**-2.240**	**-744**	**-29.841**
Selling Income	11.345	11.345	11.345	11.345	11.345	11.345	11.345	11.345	11.345	11.345	11.345	11.345	11.345	11.345	11.345	11.345	11.345	11.345	11.345	11.345	226.896
Net Benefit	**9.105**	**10.601**	**9.105**	**10.601**	**9.105**	**10.601**	**9.105**	**10.601**	**9.105**	**10.601**	**9.105**	**10.601**	**9.105**	**10.601**	**9.105**	**10.601**	**9.105**	**10.601**	**9.105**	**10.601**	**197.055**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-2.240,06	-888,78	-3.196,73	-1.268,35	-4.561,95	-1.810,03	-6.510,22	-2.583,04	-9.290,53	-3.686,17	-13.258,23	-5.260,42	-18.920,41	-7.506,99	-27.000,73	-10.712,99	-38.531,91	-15.288,17	-54.987,71	-21.817,28	-249.321
Adj Income	11.344,80	13.552,50	16.189,81	19.340,35	23.103,98	27.600,02	32.970,98	39.387,14	47.051,87	56.208,17	67.146,28	80.212,94	95.822,38	114.469,42	136.745,17	163.355,78	195.144,81	233.119,99	278.485,14	332.678,35	1.983.930
Adj Net Benefit	**9.104,74**	**12.663,72**	**12.993,09**	**18.072,00**	**18.542,04**	**25.789,99**	**26.460,77**	**36.804,10**	**37.761,34**	**52.522,00**	**53.888,05**	**74.952,52**	**76.901,97**	**106.962,43**	**109.744,43**	**152.642,79**	**156.612,90**	**217.831,82**	**223.497,44**	**310.861,07**	**1.734.609**
Actualized Values (discount rate: r=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-2.240,06	-764,54	-2.365,48	-807,35	-2.497,92	-852,55	-2.637,77	-900,28	-2.785,46	-950,69	-2.941,41	-1.003,92	-3.106,10	-1.060,12	-3.280,00	-1.119,48	-3.463,64	-1.182,16	-3.657,57	-1.248,34	-38.865
Act Income	11.344,80	11.658,06	11.979,98	12.310,78	12.650,71	13.000,04	13.359,01	13.727,89	14.106,95	14.496,49	14.896,78	15.308,12	15.730,82	16.165,20	16.611,56	17.070,26	17.541,62	18.025,99	18.523,74	19.035,24	297.544
Act Benefit	**9.104,74**	**10.893,52**	**9.614,49**	**11.503,43**	**10.152,79**	**12.147,49**	**10.721,23**	**12.827,60**	**11.321,49**	**13.545,80**	**11.955,37**	**14.304,20**	**12.624,73**	**15.105,07**	**13.331,56**	**15.950,78**	**14.077,97**	**16.843,83**	**14.866,17**	**17.786,89**	**258.679**

NPV 258.679 MZN
BCR 7,66

CBA Polypropylene Bag + Actellic 2%

Total Production (kg) **900**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,75
Productivity (ton/ha)	1,2
Total Production (kg)	**900**
Storage Losses	2,20%
Total Losses (kg)	**19,80**

Maize Inventory Analysis (kg)	
Beginning Inventory	900
Amount Lost	19,80
Ending Inventory	**880,20**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	880,2	0	0	0	880,20
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	880,20	0,00	0,00	0,00	880,20
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from sales (MZN)	8362	0	0	0,00	8.361,90
Household net income (MZN)	**8362**	**0**	**0**	**0,00**	**8.361,90**

CBA Polypropylene Bag + Actellic 2%

Total Production (kg) **900**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
Acquisition Price (MZN)	17
Bag Capacity (kg)	50
n° bags	18
Tot Cost Bags	306

Actellic 2%		
Actellic Cost/unit	310	*Actellic Bottle: 125g/unit*
Actellic Cost/g	2,48	
Actellic Need (g)	450	*Actellic Dose: 25g/50kg grains*
Tot Actellic Expenditure	1116	

Accessory Costs	
Inflation Rate 2014-2016	25,20%

	cost/bag	final cost
	2014	**2016**
Bamboo Strip	20	25,04	450,72
Timber	20	25,04	450,72
Plastic Cover	36	45,07	811,296
Local Labor	10	12,52	225,36

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted Values)																					
Bags Acquisition	-306		-306		-306		-306		-306		-306		-306		-306		-306		-306		
Bamboo Strips	-451		-451		-451		-451		-451		-451		-451		-451		-451		-451		
Timber	-451		-451		-451		-451		-451		-451		-451		-451		-451		-451		
Plastic Cover	-811		-811		-811		-811		-811		-811		-811		-811		-811		-811		
Local Labor	-225		-225		-225		-225		-225		-225		-225		-225		-225		-225		
Actellic Acquisition	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	
Total Cost	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-44.761**
Selling Income	8.362	8.362	8.362	8.362	8.362	8.362	8.362	8.362	8.362	8.362	8.362	8.362	8.362	8.362	8.362	8.362	8.362	8.362	8.362	8.362	167.238
Net Benefit	**5.002**	**7.246**	**5.002**	**7.246**	**5.002**	**7.246**	**5.002**	**7.246**	**5.002**	**7.246**	**5.002**	**7.246**	**5.002**	**7.246**	**5.002**	**7.246**	**5.002**	**7.246**	**5.002**	**7.246**	**122.477**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-3.360,10	-1.333,17	-4.795,09	-1.902,53	-6.842,92	-2.715,04	-9.765,33	-3.874,55	-13.935,80	-5.529,26	-19.887,34	-7.890,63	-28.380,62	-11.260,48	-40.501,10	-16.069,48	-57.797,87	-22.932,26	-82.481,56	-32.725,92	-373.981
Adj Income	8.361,90	9.989,13	11.933,01	14.255,17	17.029,23	20.343,12	24.301,89	29.031,04	34.680,48	41.429,30	49.491,44	59.122,47	70.627,71	84.371,86	100.790,62	120.404,47	143.835,18	171.825,51	205.262,76	245.206,89	1.462.293
Adj Net Benefit	**5.001,80**	**8.655,95**	**7.137,92**	**12.352,64**	**10.186,31**	**17.628,07**	**14.536,56**	**25.156,48**	**20.744,68**	**35.900,04**	**29.604,09**	**51.231,84**	**42.247,09**	**73.111,38**	**60.289,52**	**104.334,99**	**86.037,31**	**148.893,25**	**122.781,20**	**212.480,97**	**1.088.312**
Actualized Values (discount Rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-3.360,10	-1.146,82	-3.548,22	-1.211,02	-3.746,88	-1.278,83	-3.956,66	-1.350,43	-4.178,19	-1.426,03	-4.412,12	-1.505,88	-4.659,15	-1.590,19	-4.920,00	-1.679,22	-5.195,47	-1.773,24	-5.486,35	-1.872,52	-58.297
Act Income	8.361,90	8.592,80	8.830,07	9.073,89	9.324,45	9.581,92	9.846,51	10.118,40	10.397,80	10.684,91	10.979,95	11.283,14	11.594,70	11.914,86	12.243,87	12.581,96	12.929,38	13.286,40	13.653,28	14.030,28	219.310
Act Benefit	**5.001,80**	**7.445,98**	**5.281,85**	**7.862,87**	**5.577,57**	**8.303,10**	**5.889,85**	**8.767,97**	**6.219,61**	**9.258,88**	**6.567,83**	**9.777,26**	**6.935,56**	**10.324,68**	**7.323,87**	**10.902,74**	**7.733,92**	**11.513,16**	**8.166,92**	**12.157,77**	**161.013**

NPV	161.013 MZN
BCR	3,76

CBA Polypropylene Bag + Actellic 2%

Total Production (kg) **900**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,75
Productivity (ton/ha)	1,2
Total Production (kg)	**900**
Storage Losses	2,20%
Total Losses (kg)	**19,80**

Maize Inventory Analysis (kg)	
Beginning Inventory	900
Amount Lost	19,80
Ending Inventory	**880,20**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	880,2	880,20
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	880,20	880,20
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from sales (MZN)	0	0	0	17.017,20	17.017,20
Household net income (MZN)	**0**	**0**	**0**	**17.017,20**	**17.017,20**

CBA Polypropylene Bag + Actellic 2%

Total Production (kg) **900**

Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
Acquisition Price (MZN)	17
Bag Capacity (kg)	50
n° bags	18
Total Cost Bags	306

Actellic 2%		
Actellic Cost/unit	310	Actellic Bottle: 125g/unit
Actellic Cost/g	2,48	
Actellic Need (g)	450	Actellic Dose: 25g/50kg grains
Total Actellic Expenditure	1116	

Accessory Costs			
Inflation Rate 2014-2016		0,252	
cost/bag			final cost
	2014	2016	
Bamboo Strip	**20**	**25,04**	
Timber	20	25,04	450,72
Plastic Cover	36	45,07	811,296
Local Labor	10	12,52	225,36

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bags Acquisition	-306		-306		-306		-306		-306		-306		-306		-306		-306		-306		
Bamboo Strips	-451		-451		-451		-451		-451		-451		-451		-451		-451		-451		
Timber	-451		-451		-451		-451		-451		-451		-451		-451		-451		-451		
Plastic Cover	-811		-811		-811		-811		-811		-811		-811		-811		-811		-811		
Local Labor	-225		-225		-225		-225		-225		-225		-225		-225		-225		-225		
Actellic Acquisition	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	-1.116	
Total Cost	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-3.360**	**-1.116**	**-44.761**
Selling Income	17.017	17.017	17.017	17.017	17.017	17.017	17.017	17.017	17.017	17.017	17.017	17.017	17.017	17.017	17.017	17.017	17.017	17.017	17.017	17.017	340.344
Net Benefit	**13.657**	**15.901**	**13.657**	**15.901**	**13.657**	**15.901**	**13.657**	**15.901**	**13.657**	**15.901**	**13.657**	**15.901**	**13.657**	**15.901**	**13.657**	**15.901**	**13.657**	**15.901**	**13.657**	**15.901**	**295.583**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-3.360,10	-1.333,17	-4.795,09	-1.902,53	-6.842,92	-2.715,04	-9.765,33	-3.874,55	-13.935,80	-5.529,26	-19.887,34	-7.890,63	-28.380,62	-11.260,48	-40.501,10	-16.069,48	-57.797,87	-22.932,26	-82.481,56	-32.725,92	-373.981
Adj Income	17.017,20	20.328,75	24.284,72	29.010,53	34.655,98	41.400,03	49.456,48	59.080,71	70.577,81	84.312,25	100.719,42	120.319,42	143.733,58	171.704,13	205.117,75	245.033,67	292.717,22	349.679,99	417.727,72	499.017,53	2.975.895
Adj Net Benefit	**13.657,10**	**18.995,57**	**19.489,63**	**27.108,00**	**27.813,05**	**38.684,99**	**39.691,15**	**55.206,15**	**56.642,02**	**78.783,00**	**80.832,07**	**112.428,78**	**115.352,96**	**160.443,65**	**164.616,65**	**228.964,19**	**234.919,35**	**326.747,73**	**335.246,15**	**466.291,61**	**2.601.914**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-3.360,10	-1.146,82	-3.548,22	-1.211,02	-3.746,88	-1.278,83	-3.956,66	-1.350,43	-4.178,19	-1.426,03	-4.412,12	-1.505,88	-4.659,15	-1.590,19	-4.920,00	-1.679,22	-5.195,47	-1.773,24	-5.486,35	-1.872,52	-58.297
Act Income	17.017,20	17.487,09	17.969,96	18.466,17	18.976,07	19.500,06	20.038,51	20.591,83	21.160,43	21.744,73	22.345,17	22.962,18	23.596,23	24.247,79	24.917,35	25.605,39	26.312,43	27.038,99	27.785,61	28.552,85	446.316
Act Benefit	**13.657,10**	**16.340,28**	**14.421,74**	**17.255,14**	**15.229,19**	**18.221,23**	**16.081,85**	**19.241,40**	**16.982,24**	**20.318,70**	**17.933,05**	**21.456,31**	**18.937,09**	**22.657,61**	**19.997,34**	**23.926,17**	**21.116,96**	**25.265,75**	**22.299,26**	**26.680,34**	**388.019**

NPV	388.019 MZN
BCR	7,66

CBA Polypropylene Bag + Actellic 2%

Total Production (kg) **1200**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	1
Productivity (ton/ha)	1,2
Total Production (kg)	**1200**
Storage Losses	2,20%
Total Losses (kg)	**26,40**

Maize Inventory Analysis (kg)	
Beginning Inventory	1200
Amount Lost	26,40
Ending Inventory	**1173,60**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	1173,6	0	0	0	1173,60
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	1173,60	0,00	0,00	0,00	1173,60
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from sales (MZN)	11149	0	0	0,00	11.149,20
Household net income (MZN)	**11149**	**0**	**0**	**0,00**	**11.149,20**

CBA Polypropylene Bag + Actellic 2%

Total Production (kg) **1200**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag

Acquisition Price (MZN)	17
Bag Capacity (kg)	50
n° bags	24
Total Cost Bags	408

Actellic 2%

Actellic Cost/unit	310	Actellic Bottle: 125g/unit
Actellic Cost/g	2,48	
Actellic Need (g)	600	Actellic Dose: 25g/50kg grains
Total Actellic Expenditure	1488	

Accessory Costs

Inflation Rate 2014-2016 0,252

	cost/bag	final cost
	2014	2016
Bamboo Strip	**20**	**25,04**
Timber	20	25,04	600,96
Plastic Cover	36	45,07	1081,728
Local Labor	10	12,52	300,48

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bags Acquisition	-408		-408		-408		-408		-408		-408		-408		-408		-408		-408		
Bamboo Strips	-601		-601		-601		-601		-601		-601		-601		-601		-601		-601		
Timber	-601		-601		-601		-601		-601		-601		-601		-601		-601		-601		
Plastic Cover	-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		
Local Labor	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Actellic Acquisition	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	
Total Cost	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-59.681**
Selling Income	11.149	11.149	11.149	11.149	11.149	11.149	11.149	11.149	11.149	11.149	11.149	11.149	11.149	11.149	11.149	11.149	11.149	11.149	11.149	11.149	222.984
Net Benefit	**6.669**	**9.661**	**6.669**	**9.661**	**6.669**	**9.661**	**6.669**	**9.661**	**6.669**	**9.661**	**6.669**	**9.661**	**6.669**	**9.661**	**6.669**	**9.661**	**6.669**	**9.661**	**6.669**	**9.661**	**163.303**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-4.480,13	-1.777,56	-6.393,45	-2.536,71	-9.123,90	-3.620,06	-13.020,43	-5.166,07	-18.581,06	-7.372,34	-26.516,46	-10.520,84	-37.840,82	-15.013,97	-54.001,47	-21.425,97	-77.063,83	-30.576,35	-109.975,42	-43.634,56	-498.641
Adj Income	11.149,20	13.318,83	15.910,68	19.006,90	22.705,64	27.124,16	32.402,52	38.708,05	46.240,64	55.239,06	65.988,58	78.829,96	94.170,27	112.495,81	134.387,49	160.539,30	191.780,25	229.100,68	273.683,68	326.942,52	1.949.724
Adj Net Benefit	**6.669,07**	**11.541,27**	**9.517,23**	**16.470,19**	**13.581,74**	**23.504,10**	**19.382,08**	**33.541,98**	**27.659,57**	**47.866,72**	**39.472,13**	**68.309,12**	**56.329,45**	**97.481,84**	**80.386,02**	**139.113,32**	**114.716,42**	**198.524,33**	**163.708,26**	**283.307,96**	**1.451.083**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-4.480,13	-1.529,09	-4.730,96	-1.614,70	-4.995,84	-1.705,10	-5.275,55	-1.800,57	-5.570,92	-1.901,38	-5.882,82	-2.007,83	-6.212,19	-2.120,25	-6.560,00	-2.238,96	-6.927,29	-2.364,31	-7.315,13	-2.496,69	-77.730
Act Income	11.149,20	11.457,06	11.773,42	12.098,52	12.432,60	12.775,90	13.128,68	13.491,20	13.863,73	14.246,55	14.639,94	15.044,19	15.459,60	15.886,49	16.325,16	16.775,94	17.239,18	17.715,20	18.204,37	18.707,04	292.414
Act Benefit	**6.669,07**	**9.927,97**	**7.042,46**	**10.483,82**	**7.436,76**	**11.070,80**	**7.853,13**	**11.690,63**	**8.292,81**	**12.345,17**	**8.757,11**	**13.036,35**	**9.247,41**	**13.766,24**	**9.765,15**	**14.536,98**	**10.311,89**	**15.350,88**	**10.889,23**	**16.210,35**	**214.684**

NPV 214.684 MZN

BCR 3,76

CBA Polypropylene Bag + Actellic 2%

Total Production (kg) **1200**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	1
Productivity (ton/ha)	1,2
Total Production (kg)	**1200**
Storage Losses	2,20%
Total Losses (kg)	**26,40**

Maize Inventory Analysis (kg)	
Beginning Inventory	1200
Amount Lost	26,40
Ending Inventory	**1173,60**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	1173,6	1173,60
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	1173,60	1173,60
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	22.689,60	22.689,60
Household net Income (MZN)	**0**	**0**	**0**	**22.689,60**	**22.689,60**

CBA Polypropylene Bag + Actellic 2%

Total Production (kg) **1200**

Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
Acquisition Price (MAN)	17
Bag Capacity (kg)	50
n° bags	24
Total Cost Bags	408

Actellic 2%		
Actellic Cost/unit	310	*Actellic Bottle: 125g/unit*
Actellic Cost/g	2,48	
Actellic Need (g)	600	*Actellic Dose: 25g/50kg grains*
Total Actellic Expenditure	1488	

Accessory Costs			
Inflation Rate 2014-2016	25,20%		
	cost/bag		final cost
	2014	**2016**	
Bamboo Strip	20	25,04	600,96
Timber	20	25,04	600,96
Plastic Cover	36	45,07	1081,728
Local Labor	10	12,52	300,48

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted Values)																					
Bags Acquisition	-408		-408		-408		-408		-408		-408		-408		-408		-408		-408		
Bamboo Strips	-601		-601		-601		-601		-601		-601		-601		-601		-601		-601		
Timber	-601		-601		-601		-601		-601		-601		-601		-601		-601		-601		
Plastic Cover	-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		
Local Labor	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Actellic Acquisition	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	-1.488	
Total Cost	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-4.480**	**-1.488**	**-59.681**
Selling Income	22.690	22.690	22.690	22.690	22.690	22.690	22.690	22.690	22.690	22.690	22.690	22.690	22.690	22.690	22.690	22.690	22.690	22.690	22.690	22.690	453.792
Net Benefit	**18.209**	**21.202**	**18.209**	**21.202**	**18.209**	**21.202**	**18.209**	**21.202**	**18.209**	**21.202**	**18.209**	**21.202**	**18.209**	**21.202**	**18.209**	**21.202**	**18.209**	**21.202**	**18.209**	**21.202**	**394.111**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-4.480,13	-1.777,56	-6.393,45	-2.536,71	-9.123,90	-3.620,06	-13.020,43	-5.166,07	-18.581,06	-7.372,34	-26.516,46	-10.520,84	-37.840,82	-15.013,97	-54.001,47	-21.425,97	-77.063,83	-30.576,35	-109.975,42	-43.634,56	-498.641
Adj Income	22.689,60	27.105,00	32.379,63	38.680,70	46.207,97	55.200,04	65.941,97	78.774,27	94.103,75	112.416,34	134.292,56	160.425,89	191.644,77	228.938,84	273.490,34	326.711,56	390.289,62	466.239,99	556.970,29	665.356,70	3.967.860
Adj Net Benefit	**18.209,47**	**25.327,43**	**25.986,18**	**36.144,00**	**37.084,07**	**51.579,98**	**52.921,53**	**73.608,20**	**75.522,69**	**105.043,99**	**107.776,10**	**149.905,05**	**153.803,95**	**213.924,87**	**219.488,87**	**305.285,58**	**313.225,79**	**435.663,64**	**446.994,87**	**621.722,14**	**3.469.218**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-4.480,13	-1.529,09	-4.730,96	-1.614,70	-4.995,84	-1.705,10	-5.275,55	-1.800,57	-5.570,92	-1.901,38	-5.882,82	-2.007,83	-6.212,19	-2.120,25	-6.560,00	-2.238,96	-6.927,29	-2.364,31	-7.315,13	-2.496,69	-77.730
Act Income	22.689,60	23.316,13	23.959,95	24.621,56	25.301,43	26.000,07	26.718,01	27.455,77	28.213,91	28.992,97	29.793,56	30.616,24	31.461,64	32.330,39	33.223,13	34.140,52	35.083,23	36.051,98	37.047,48	38.070,47	595.088
Act Benefit	**18.209,47**	**21.787,04**	**19.228,99**	**23.006,86**	**20.305,59**	**24.294,97**	**21.442,46**	**25.655,20**	**22.642,99**	**27.091,60**	**23.910,73**	**28.608,41**	**25.249,45**	**30.210,14**	**26.663,12**	**31.901,56**	**28.155,95**	**33.687,67**	**29.732,35**	**35.573,78**	**517.358**

NPV	517.358 MZN
BCR	7,66

CBA Improved Granary

Total Production (kg) **350**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	0,7
Total Production (kg)	**350**
Storage Losses	10,44%
Total Losses (kg)	**36,54**

Maize Inventory Analysis (kg)	
Beginning Inventory	350
Amount Lost	36,54
Ending Inventory	**313,46**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	313,46	0	0	0	313,46
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	313,46	0,00	0,00	0,00	313,46
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	2978	0	0	0,00	2.977,87
Household net income (MZN)	**2978**	**0**	**0**	**0,00**	**2.977,87**

CBA Improved Granary

Total Production (kg) **350**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Granary Costs

Granary Capacity (kg)	350
n° Granary Needed	1,0

Inflation Rate 2014-2016	25,20%

	2014	**2016**
Mud	40	50,08
Timber Strips	50	62,60
Timber Platform	100	125,20
Timber Walls	100	125,20
Timber Roof	50	62,60
Grass Roof	35	43,82
Bamboo Antirat	30	37,56
Labour 10dd	500	626,00

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Mud	-50			-50			-50			-50			-50			-50			-50		
Timber Strips	-63			-63			-63			-63			-63			-63			-63		
Timber Platform	-125			-125			-125			-125			-125			-125			-125		
Timber Walls	-125			-125			-125			-125			-125			-125			-125		
Timber Roof	-63			-63			-63			-63			-63			-63			-63		
Grass Roof	-44			-44			-44			-44			-44			-44			-44		
Bamboo Antirat	-38			-38			-38			-38			-38			-38			-38		
Labour 10dd	-626			-626			-626			-626			-626			-626			-626		
Total Cost	**-1.133**	**0**	**0**	**-1.133**	**0**	**0**	**-1.133**	**0**	**0**	**-1.133**	**0**	**0**	**-1.133**	**0**	**0**	**-1.133**	**0**	**0**	**-1.133**	**0**	**-7.931**
Selling_Income	2.978	2.978	2.978	2.978	2.978	2.978	2.978	2.978	2.978	2.978	2.978	2.978	2.978	2.978	2.978	2.978	2.978	2.978	2.978	2.978	59.557
Net Benefit	**1.845**	**2.978**	**2.978**	**1.845**	**2.978**	**2.978**	**1.845**	**2.978**	**2.978**	**1.845**	**2.978**	**2.978**	**1.845**	**2.978**	**2.978**	**1.845**	**2.978**	**2.978**	**1.845**	**2.978**	**51.626**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-1.133,06	0,00	0,00	-1.931,61	0,00	0,00	-3.292,97	0,00	0,00	-5.613,78	0,00	0,00	-9.570,24	0,00	0,00	-16.315,13	0,00	0,00	-27.813,66	0,00	-65.670
Adj Income	2.977,87	3.557,36	4.249,63	5.076,60	6.064,51	7.244,66	8.654,48	10.338,64	12.350,54	14.753,95	17.625,07	21.054,91	25.152,19	30.046,81	35.893,92	42.878,88	51.223,11	61.191,12	73.098,91	87.323,96	520.757
Adj Net Benefit	**1.844,81**	**3.557,36**	**4.249,63**	**3.144,99**	**6.064,51**	**7.244,66**	**5.361,50**	**10.338,64**	**12.350,54**	**9.140,17**	**17.625,07**	**21.054,91**	**15.581,95**	**30.046,81**	**35.893,92**	**26.563,74**	**51.223,11**	**61.191,12**	**45.285,26**	**87.323,96**	**455.087**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-1.133,06	0,00	0,00	-1.229,54	0,00	0,00	-1.334,23	0,00	0,00	-1.447,83	0,00	0,00	-1.571,11	0,00	0,00	-1.704,89	0,00	0,00	-1.850,06	0,00	-10.271
Act Income	2.977,87	3.060,10	3.144,60	3.231,43	3.320,66	3.412,35	3.506,57	3.603,40	3.702,90	3.805,15	3.910,22	4.018,19	4.129,15	4.243,16	4.360,33	4.480,73	4.604,46	4.731,60	4.862,25	4.996,51	78.102
Act Benefit	**1.844,81**	**3.060,10**	**3.144,60**	**2.001,89**	**3.320,66**	**3.412,35**	**2.172,35**	**3.603,40**	**3.702,90**	**2.357,31**	**3.910,22**	**4.018,19**	**2.558,03**	**4.243,16**	**4.360,33**	**2.775,84**	**4.604,46**	**4.731,60**	**3.012,20**	**4.996,51**	**67.831**

NPV	67.831 MZN
BCR	7,60

CBA Improved Granary

Total Production (kg) **350**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	0,7
Total Production (kg)	**350**
Storage Losses	10,44%
Total Losses (kg)	**36,54**

Maize Inventory Analysis (kg)	
Beginning Inventory	350
Amount Lost	36,54
Ending Inventory	**313,46**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	313,46	313,46
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	313,46	313,46
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	6.060,23	6.060,23
Household net Income (MZN)	**0**	**0**	**0**	**6.060,23**	**6.060,23**

CBA Improved Granary

Total Production (kg) 350
Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Granary Costs

Granary Capacity (kg)	350
n° Granary Needed	1,0

Inflation Rate 2014-2016	25,20%

	2014	2016
Mud	40	50,08
Timber Strips	50	62,60
Timber Platform	100	125,20
Timber Walls	100	125,20
Timber Roof	50	62,60
Grass Roof	35	43,82
Bamboo Antirat	30	37,56
Labour 10dd	500	626,00

Period	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Total
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Mud	-50			-50			-50			-50			-50			-50			-50		
Timber Strips	-63			-63			-63			-63			-63			-63			-63		
Timber Platform	-125			-125			-125			-125			-125			-125			-125		
Timber Walls	-125			-125			-125			-125			-125			-125			-125		
Timber Roof	-63			-63			-63			-63			-63			-63			-63		
Grass Roof	-44			-44			-44			-44			-44			-44			-44		
Bamboo Antirat	-38			-38			-38			-38			-38			-38			-38		
Labour 10dd	-626			-626			-626			-626			-626			-626			-626		
Total Cost	**-1.133**	**0**	**0**	**-1.133**	**0**	**0**	**-1.133**	**0**	**0**	**-1.133**	**0**	**0**	**-1.133**	**0**	**0**	**-1.133**	**0**	**0**	**-1.133**	**0**	**-7.931**
Selling_Income	6.060	6.060	6.060	6.060	6.060	6.060	6.060	6.060	6.060	6.060	6.060	6.060	6.060	6.060	6.060	6.060	6.060	6.060	6.060	6.060	121.205
Net Benefit	**4.927**	**6.060**	**6.060**	**4.927**	**6.060**	**6.060**	**4.927**	**6.060**	**6.060**	**4.927**	**6.060**	**6.060**	**4.927**	**6.060**	**6.060**	**4.927**	**6.060**	**6.060**	**4.927**	**6.060**	**113.273**
Adjusted Values (annual Inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-1.133,06	0,00	0,00	-1.931,61	0,00	0,00	-3.292,97	0,00	0,00	-5.613,78	0,00	0,00	-9.570,24	0,00	0,00	-16.315,13	0,00	0,00	-27.813,66	0,00	-65.670
Adj Income	6.060,23	7.239,55	8.648,36	10.331,33	12.341,81	14.743,53	17.612,62	21.040,03	25.134,42	30.025,58	35.868,56	42.848,58	51.186,92	61.147,89	73.047,27	87.262,27	104.243,51	124.529,30	148.762,70	177.711,92	1.059.786
Adj Net Benefit	**4.927,17**	**7.239,55**	**8.648,36**	**8.399,72**	**12.341,81**	**14.743,53**	**14.319,65**	**21.040,03**	**25.134,42**	**24.411,80**	**35.868,56**	**42.848,58**	**41.616,67**	**61.147,89**	**73.047,27**	**70.947,14**	**104.243,51**	**124.529,30**	**120.949,04**	**177.711,92**	**994.116**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-1.133,06	0,00	0,00	-1.229,54	0,00	0,00	-1.334,23	0,00	0,00	-1.447,83	0,00	0,00	-1.571,11	0,00	0,00	-1.704,89	0,00	0,00	-1.850,06	0,00	-10.271
Act Income	6.060,23	6.227,57	6.399,53	6.576,24	6.757,83	6.944,43	7.136,19	7.333,24	7.535,73	7.743,81	7.957,64	8.177,37	8.403,18	8.635,21	8.873,66	9.118,68	9.370,48	9.629,22	9.895,11	10.168,35	158.944
Act Benefit	**4.927,17**	**6.227,57**	**6.399,53**	**5.346,70**	**6.757,83**	**6.944,43**	**5.801,96**	**7.333,24**	**7.535,73**	**6.295,98**	**7.957,64**	**8.177,37**	**6.832,06**	**8.635,21**	**8.873,66**	**7.413,79**	**9.370,48**	**9.629,22**	**8.045,06**	**10.168,35**	**148.673**

NPV 148.673 MZN
BCR 15,48

CBA – Improved Granary

Total Production (kg) **600**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	1,2
Total Production (kg)	**600**
Storage Losses	10,44%
Total Losses (kg)	**62,64**

Maize Inventory Analysis (kg)	
Beginning Inventory	600
Amount Lost	62,64
Ending Inventory	**537,36**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	537,36	0	0	0	537,36
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	537,36	0,00	0,00	0,00	537,36
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	5105	0	0	0,00	5.104,92
Household net Income (MZN)	**5105**	**0**	**0**	**0,00**	**5.104,92**

CBA Improved Granary

Total Production (kg) 600

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Granary Costs

Granary Capacity (kg)	350
n° Granary Needed	1,7

Inflation Rate 2014-2016	25,20%

	2014	2016
Mud	40	50,08
Timber Strips	50	62,60
Timber Platform	100	125,20
Timber Walls	100	125,20
Timber Roof	50	62,60
Grass Roof	35	43,82
Bamboo Antirat	30	37,56
Labour 10dd	500	626,00

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Mud	-86			-86			-86			-86			-86			-86			-86		
Timber Strips	-107			-107			-107			-107			-107			-107			-107		
Timber Platform	-215			-215			-215			-215			-215			-215			-215		
Timber Walls	-215			-215			-215			-215			-215			-215			-215		
Timber Roof	-107			-107			-107			-107			-107			-107			-107		
Grass Roof	-75			-75			-75			-75			-75			-75			-75		
Bamboo Antirat	-64			-64			-64			-64			-64			-64			-64		
Labour 10dd	-1.073			-1.073			-1.073			-1.073			-1.073			-1.073			-1.073		
Total Cost	**-1.942**	**0**	**0**	**-1.942**	**0**	**0**	**-1.942**	**0**	**0**	**-1.942**	**0**	**0**	**-1.942**	**0**	**0**	**-1.942**	**0**	**0**	**-1.942**	**0**	**-13.597**
Selling_Income	5.105	5.105	5.105	5.105	5.105	5.105	5.105	5.105	5.105	5.105	5.105	5.105	5.105	5.105	5.105	5.105	5.105	5.105	5.105	5.105	102.098
Net Benefit	**3.163**	**5.105**	**5.105**	**3.163**	**5.105**	**5.105**	**3.163**	**5.105**	**5.105**	**3.163**	**5.105**	**5.105**	**3.163**	**5.105**	**5.105**	**3.163**	**5.105**	**5.105**	**3.163**	**5.105**	**88.502**
Adjusted Values (annual Inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-1.942,39	0,00	0,00	-3.311,34	0,00	0,00	-5.645,09	0,00	0,00	-9.623,63	0,00	0,00	-16.406,13	0,00	0,00	-27.968,80	0,00	0,00	-47.680,55	0,00	-112.578
Adj Income	5.104,92	6.098,34	7.285,07	8.702,75	10.396,30	12.419,43	14.836,25	17.723,38	21.172,35	25.292,49	30.214,40	36.094,13	43.118,05	51.508,82	61.532,43	73.506,64	87.811,04	104.899,07	125.312,42	149.698,22	892.726
Adj Net Benefit	**3.162,53**	**6.098,34**	**7.285,07**	**5.391,41**	**10.396,30**	**12.419,43**	**9.191,15**	**17.723,38**	**21.172,35**	**15.668,86**	**30.214,40**	**36.094,13**	**26.711,91**	**51.508,82**	**61.532,43**	**45.537,85**	**87.811,04**	**104.899,07**	**77.631,87**	**149.698,22**	**780.149**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-1.942,39	0,00	0,00	-2.107,78	0,00	0,00	-2.287,25	0,00	0,00	-2.482,00	0,00	0,00	-2.693,34	0,00	0,00	-2.922,67	0,00	0,00	-3.171,52	0,00	-17.607
Act Income	5.104,92	5.245,88	5.390,74	5.539,59	5.692,55	5.849,74	6.011,27	6.177,26	6.347,83	6.523,11	6.703,23	6.888,33	7.078,54	7.274,00	7.474,85	7.681,25	7.893,36	8.111,32	8.335,29	8.565,45	133.889
Act Benefit	**3.162,53**	**5.245,88**	**5.390,74**	**3.431,81**	**5.692,55**	**5.849,74**	**3.724,02**	**6.177,26**	**6.347,83**	**4.041,11**	**6.703,23**	**6.888,33**	**4.385,20**	**7.274,00**	**7.474,85**	**4.758,59**	**7.893,36**	**8.111,32**	**5.163,77**	**8.565,45**	**116.282**

NPV 116.282 MZN

BCR 7,60

CBA Improved Granary

Total Production (kg) **600**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	1,2
Total Production (kg)	**600**
Storage Losses	10,44%
Total Losses (kg)	**62,64**

Maize Inventory Analysis (kg)	
Beginning Inventory	600
Amount Lost	62,64
Ending Inventory	**537,36**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	537,36	537,36
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	537,36	537,36
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	10.388,96	10.388,96
Household net Income (MZN)	**0**	**0**	**0**	**10.388,96**	**10.388,96**

CBA Improved Granary

Total Production (kg) 600
Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Granary Costs

Granary Capacity (kg)	350
n° Granary Needed	1,7

Inflation Rate 2014-2016	25,20%

	2014	**2016**
Mud	40	50,08
Timber Strips	50	62,60
Timber Platform	100	125,20
Timber Walls	100	125,20
Timber Roof	50	62,60
Grass Roof	35	43,82
Bamboo Antirat	30	37,56
Labour 10dd	500	626,00

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Mud	-86			-86			-86			-86			-86			-86			-86		
Timber Strips	-107			-107			-107			-107			-107			-107			-107		
Timber Platform	-215			-215			-215			-215			-215			-215			-215		
Timber Walls	-215			-215			-215			-215			-215			-215			-215		
Timber Roof	-107			-107			-107			-107			-107			-107			-107		
Grass Roof	-75			-75			-75			-75			-75			-75			-75		
Bamboo Antirat	-64			-64			-64			-64			-64			-64			-64		
Labour 10dd	-1.073			-1.073			-1.073			-1.073			-1.073			-1.073			-1.073		
Total Cost	**-1.942**	**0**	**0**	**-1.942**	**0**	**0**	**-1.942**	**0**	**0**	**-1.942**	**0**	**0**	**-1.942**	**0**	**0**	**-1.942**	**0**	**0**	**-1.942**	**0**	**-13.597**
Selling_Income	10.389	10.389	10.389	10.389	10.389	10.389	10.389	10.389	10.389	10.389	10.389	10.389	10.389	10.389	10.389	10.389	10.389	10.389	10.389	10.389	207.779
Net Benefit	**8.447**	**10.389**	**10.389**	**8.447**	**10.389**	**10.389**	**8.447**	**10.389**	**10.389**	**8.447**	**10.389**	**10.389**	**8.447**	**10.389**	**10.389**	**8.447**	**10.389**	**10.389**	**8.447**	**10.389**	**194.182**
Adjusted Values (annual Inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-1.942,39	0,00	0,00	-3.311,34	0,00	0,00	-5.645,09	0,00	0,00	-9.623,63	0,00	0,00	-16.406,13	0,00	0,00	-27.968,80	0,00	0,00	-47.680,55	0,00	-112.578
Adj Income	10.388,96	12.410,65	14.825,76	17.710,86	21.157,39	25.274,62	30.193,06	36.068,63	43.087,59	51.472,43	61.488,96	73.454,72	87.749,00	104.824,96	125.223,90	149.592,47	178.703,16	213.478,80	255.021,77	304.649,01	1.816.777
Adj Net Benefit	**8.446,57**	**12.410,65**	**14.825,76**	**14.399,52**	**21.157,39**	**25.274,62**	**24.547,97**	**36.068,63**	**43.087,59**	**41.848,80**	**61.488,96**	**73.454,72**	**71.342,87**	**104.824,96**	**125.223,90**	**121.623,67**	**178.703,16**	**213.478,80**	**207.341,22**	**304.649,01**	**1.704.199**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-1.942,39	0,00	0,00	-2.107,78	0,00	0,00	-2.287,25	0,00	0,00	-2.482,00	0,00	0,00	-2.693,34	0,00	0,00	-2.922,67	0,00	0,00	-3.171,52	0,00	-17.607
Act Income	10.388,96	10.675,83	10.970,62	11.273,55	11.584,85	11.904,74	12.233,46	12.571,26	12.918,39	13.275,11	13.641,67	14.018,36	14.405,44	14.803,22	15.211,98	15.632,03	16.063,67	16.507,24	16.963,05	17.431,45	272.475
Act Benefit	**8.446,57**	**10.675,83**	**10.970,62**	**9.165,77**	**11.584,85**	**11.904,74**	**9.946,21**	**12.571,26**	**12.918,39**	**10.793,10**	**13.641,67**	**14.018,36**	**11.712,11**	**14.803,22**	**15.211,98**	**12.709,36**	**16.063,67**	**16.507,24**	**13.791,53**	**17.431,45**	**254.868**

NPV 254.868 MZN
BCR 15,48

CBA – Improved Granary

Total Production (kg) **900**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,75
Productivity (ton/ha)	1,2
Total Production (kg)	**900**
Storage Losses	10,44%
Total Losses (kg)	**93,96**

Maize Inventory Analysis (kg)	
Beginning Inventory	900
Amount Lost	93,96
Ending Inventory	**806,04**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	806,04	0	0	0	806,04
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	806,04	0,00	0,00	0,00	806,04
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	7657	0	0	0,00	7.657,38
Household net Income (MZN)	**7657**	**0**	**0**	**0,00**	**7.657,38**

CBA Improved Granary

Total Production (kg) 900

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Granary Costs

Granary Capacity (kg)	350
n° Granary Needed	2,6

Inflation Rate 2014-2016	25,20%

	2014	**2016**
Mud	40	50,08
Timber Strips	50	62,60
Timber Platform	100	125,20
Timber Walls	100	125,20
Timber Roof	50	62,60
Grass Roof	35	43,82
Bamboo Antirat	30	37,56
Labour 10dd	500	626,00

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Mud	-129			-129			-129			-129			-129			-129			-129		
Timber Strips	-161			-161			-161			-161			-161			-161			-161		
Timber Platform	-322			-322			-322			-322			-322			-322			-322		
Timber Walls	-322			-322			-322			-322			-322			-322			-322		
Timber Roof	-161			-161			-161			-161			-161			-161			-161		
Grass Roof	-113			-113			-113			-113			-113			-113			-113		
Bamboo Antirat	-97			-97			-97			-97			-97			-97			-97		
Labour 10dd	-1.610			-1.610			-1.610			-1.610			-1.610			-1.610			-1.610		
Total Cost	**-2.914**	**0**	**0**	**-2.914**	**0**	**0**	**-2.914**	**0**	**0**	**-2.914**	**0**	**0**	**-2.914**	**0**	**0**	**-2.914**	**0**	**0**	**-2.914**	**0**	**-20.395**
Selling_Income	7.657	7.657	7.657	7.657	7.657	7.657	7.657	7.657	7.657	7.657	7.657	7.657	7.657	7.657	7.657	7.657	7.657	7.657	7.657	7.657	153.148
Net Benefit	**4.744**	**7.657**	**7.657**	**4.744**	**7.657**	**7.657**	**4.744**	**7.657**	**7.657**	**4.744**	**7.657**	**7.657**	**4.744**	**7.657**	**7.657**	**4.744**	**7.657**	**7.657**	**4.744**	**7.657**	**132.753**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-2.913,58	0,00	0,00	-4.967,01	0,00	0,00	-8.467,64	0,00	0,00	-14.435,44	0,00	0,00	-24.609,20	0,00	0,00	-41.953,19	0,00	0,00	-71.520,83	0,00	-168.867
Adj Income	7.657,38	9.147,51	10.927,61	13.054,12	15.594,46	18.629,14	22.254,37	26.585,07	31.758,52	37.938,73	45.321,61	54.141,19	64.677,07	77.263,23	92.298,65	110.259,97	131.716,56	157.348,60	187.968,63	224.547,33	1.339.090
Adj Net Benefit	**4.743,80**	**9.147,51**	**10.927,61**	**8.087,12**	**15.594,46**	**18.629,14**	**13.786,73**	**26.585,07**	**31.758,52**	**23.503,29**	**45.321,61**	**54.141,19**	**40.067,87**	**77.263,23**	**92.298,65**	**68.306,77**	**131.716,56**	**157.348,60**	**116.447,80**	**224.547,33**	**1.170.223**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-2.913,58	0,00	0,00	-3.161,67	0,00	0,00	-3.430,87	0,00	0,00	-3.723,00	0,00	0,00	-4.040,01	0,00	0,00	-4.384,00	0,00	0,00	-4.757,29	0,00	-26.410
Act Income	7.657,38	7.868,82	8.086,10	8.309,38	8.538,83	8.774,61	9.016,90	9.265,89	9.521,75	9.784,67	10.054,85	10.332,50	10.617,81	10.910,99	11.212,28	11.521,88	11.840,03	12.166,97	12.502,94	12.848,18	200.833
Act Benefit	**4.743,80**	**7.868,82**	**8.086,10**	**5.147,72**	**8.538,83**	**8.774,61**	**5.586,03**	**9.265,89**	**9.521,75**	**6.061,67**	**10.054,85**	**10.332,50**	**6.577,80**	**10.910,99**	**11.212,28**	**7.137,88**	**11.840,03**	**12.166,97**	**7.745,65**	**12.848,18**	**174.422**

NPV	174.422 MZN
BCR	7,60

CBA Improved Granary

Total Production (kg) **900**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,75
Productivity (ton/ha)	1,2
Total Production (kg)	**900**
Storage Losses	10,44%
Total Losses (kg)	**93,96**

Maize Inventory Analysis (kg)	
Beginning Inventory	900
Amount Lost	93,96
Ending Inventory	**806,04**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	806,04	806,04
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	806,04	806,04
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	15.583,44	15.583,44
Household net Income (MZN)	**0**	**0**	**0**	**15.583,44**	**15.583,44**

CBA Improved Granary

Total Production (kg) 900
Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Granary Costs

Granary Capacity (kg)	350
n° Granary Needed	2,6

Inflation Rate 2014-2016		25,20%
	2014	**2016**
Mud	40	50,08
Timber Strips	50	62,60
Timber Platform	100	125,20
Timber Walls	100	125,20
Timber Roof	50	62,60
Grass Roof	35	43,82
Bamboo Antirat	30	37,56
Labour 10dd	500	626,00

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Mud	-129			-129			-129			-129			-129			-129			-129		
Timber Strips	-161			-161			-161			-161			-161			-161			-161		
Timber Platform	-322			-322			-322			-322			-322			-322			-322		
Timber Walls	-322			-322			-322			-322			-322			-322			-322		
Timber Roof	-161			-161			-161			-161			-161			-161			-161		
Grass Roof	-113			-113			-113			-113			-113			-113			-113		
Bamboo Antirat	-97			-97			-97			-97			-97			-97			-97		
Labour 10dd	-1.610			-1.610			-1.610			-1.610			-1.610			-1.610			-1.610		
Total Cost	**-2.914**	**0**	**0**	**-2.914**	**0**	**0**	**-2.914**	**0**	**0**	**-2.914**	**0**	**0**	**-2.914**	**0**	**0**	**-2.914**	**0**	**0**	**-2.914**	**0**	**-20.395**
Selling_Income	15.583	15.583	15.583	15.583	15.583	15.583	15.583	15.583	15.583	15.583	15.583	15.583	15.583	15.583	15.583	15.583	15.583	15.583	15.583	15.583	311.669
Net Benefit	**12.670**	**15.583**	**15.583**	**12.670**	**15.583**	**15.583**	**12.670**	**15.583**	**15.583**	**12.670**	**15.583**	**15.583**	**12.670**	**15.583**	**15.583**	**12.670**	**15.583**	**15.583**	**12.670**	**15.583**	**291.274**
Adjusted Values (annual Inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-2.913,58	0,00	0,00	-4.967,01	0,00	0,00	-8.467,64	0,00	0,00	-14.435,44	0,00	0,00	-24.609,20	0,00	0,00	-41.953,19	0,00	0,00	-71.520,83	0,00	-168.867
Adj Income	15.583,44	18.615,98	22.238,65	26.566,29	31.736,09	37.911,93	45.289,59	54.102,95	64.631,38	77.208,64	92.233,45	110.182,08	131.623,51	157.237,44	187.835,85	224.388,70	268.054,75	320.218,20	382.532,66	456.973,52	2.725.165
Adj Net Benefit	**12.669,86**	**18.615,98**	**22.238,65**	**21.599,28**	**31.736,09**	**37.911,93**	**36.821,95**	**54.102,95**	**64.631,38**	**62.773,21**	**92.233,45**	**110.182,08**	**107.014,31**	**157.237,44**	**187.835,85**	**182.435,51**	**268.054,75**	**320.218,20**	**311.011,83**	**456.973,52**	**2.556.298**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-2.913,58	0,00	0,00	-3.161,67	0,00	0,00	-3.430,87	0,00	0,00	-3.723,00	0,00	0,00	-4.040,01	0,00	0,00	-4.384,00	0,00	0,00	-4.757,29	0,00	-26.410
Act Income	15.583,44	16.013,74	16.455,93	16.910,33	17.377,27	17.857,11	18.350,19	18.856,89	19.377,59	19.912,66	20.462,51	21.027,54	21.608,17	22.204,83	22.817,97	23.448,04	24.095,51	24.760,86	25.444,58	26.147,17	408.712
Act Benefit	**12.669,86**	**16.013,74**	**16.455,93**	**13.748,66**	**17.377,27**	**17.857,11**	**14.919,32**	**18.856,89**	**19.377,59**	**16.189,66**	**20.462,51**	**21.027,54**	**17.568,16**	**22.204,83**	**22.817,97**	**19.064,04**	**24.095,51**	**24.760,86**	**20.687,29**	**26.147,17**	**382.302**

NPV 382.302 MZN
BCR 15,48

CBA – Improved Granary

Total Production (kg) **1200**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	1
Productivity (ton/ha)	1,2
Total Production (kg)	**1200**
Storage Losses	0,1044
Total Losses (kg)	**125,28**

Maize Inventory Analysis (kg)	
Beginning Inventory	1200
Amount Lost	125,28
Ending Inventory	**1074,72**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	1074,72	0	0	0	1074,72
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	1074,72	0,00	0,00	0,00	1074,72
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	10210	0	0	0,00	10.209,84
Household net Income (MZN)	**10210**	**0**	**0**	**0,00**	**10.209,84**

CBA Improved Granary

Total Production (kg) **1200**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Granary Costs

Granary Capacity (kg)	350
n° Granary Needed	3,4

Inflation Rate 2014-2016	25,20%

	2014	**2016**
Mud	40	50,08
Timber Strips	50	62,60
Timber Platform	100	125,20
Timber Walls	100	125,20
Timber Roof	50	62,60
Grass Roof	35	43,82
Bamboo Antirat	30	37,56
Labour 10dd	500	626,00

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Mud	-172			-172			-172			-172			-172			-172			-172		
Timber Strips	-215			-215			-215			-215			-215			-215			-215		
Timber Platform	-429			-429			-429			-429			-429			-429			-429		
Timber Walls	-429			-429			-429			-429			-429			-429			-429		
Timber Roof	-215			-215			-215			-215			-215			-215			-215		
Grass Roof	-150			-150			-150			-150			-150			-150			-150		
Bamboo Antirat	-129			-129			-129			-129			-129			-129			-129		
Labour 10dd	-2.146			-2.146			-2.146			-2.146			-2.146			-2.146			-2.146		
Total Cost	**-3.885**	**0**	**0**	**-3.885**	**0**	**0**	**-3.885**	**0**	**0**	**-3.885**	**0**	**0**	**-3.885**	**0**	**0**	**-3.885**	**0**	**0**	**-3.885**	**0**	**-27.193**
Selling_Income	10.210	10.210	10.210	10.210	10.210	10.210	10.210	10.210	10.210	10.210	10.210	10.210	10.210	10.210	10.210	10.210	10.210	10.210	10.210	10.210	204.197
Net Benefit	**6.325**	**10.210**	**10.210**	**6.325**	**10.210**	**10.210**	**6.325**	**10.210**	**10.210**	**6.325**	**10.210**	**10.210**	**6.325**	**10.210**	**10.210**	**6.325**	**10.210**	**10.210**	**6.325**	**10.210**	**177.003**
Adjusted Values (annual Inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-3.884,78	0,00	0,00	-6.622,68	0,00	0,00	-11.290,19	0,00	0,00	-19.247,25	0,00	0,00	-32.812,27	0,00	0,00	-55.937,59	0,00	0,00	-95.361,11	0,00	-225.156
Adj Income	10.209,84	12.196,67	14.570,15	17.405,50	20.792,61	24.838,85	29.672,49	35.446,76	42.344,70	50.584,97	60.428,81	72.188,26	86.236,09	103.017,63	123.064,87	147.013,29	175.622,07	209.798,13	250.624,85	299.396,44	1.785.453
Adj Net Benefit	**6.325,06**	**12.196,67**	**14.570,15**	**10.782,82**	**20.792,61**	**24.838,85**	**18.382,30**	**35.446,76**	**42.344,70**	**31.337,72**	**60.428,81**	**72.188,26**	**53.423,82**	**103.017,63**	**123.064,87**	**91.075,70**	**175.622,07**	**209.798,13**	**155.263,74**	**299.396,44**	**1.560.297**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-3.884,78	0,00	0,00	-4.215,55	0,00	0,00	-4.574,50	0,00	0,00	-4.964,00	0,00	0,00	-5.386,67	0,00	0,00	-5.845,33	0,00	0,00	-6.343,05	0,00	-35.214
Act Income	10.209,84	10.491,76	10.781,47	11.079,18	11.385,11	11.699,48	12.022,54	12.354,52	12.695,66	13.046,23	13.406,47	13.776,66	14.157,07	14.547,99	14.949,70	15.362,51	15.786,71	16.222,63	16.670,58	17.130,91	267.777
Act Benefit	**6.325,06**	**10.491,76**	**10.781,47**	**6.863,62**	**11.385,11**	**11.699,48**	**7.448,04**	**12.354,52**	**12.695,66**	**8.082,22**	**13.406,47**	**13.776,66**	**8.770,40**	**14.547,99**	**14.949,70**	**9.517,18**	**15.786,71**	**16.222,63**	**10.327,54**	**17.130,91**	**232.563**

NPV 232.563 MZN

BCR 7,60

CBA Improved Granary

Total Production (kg) **1200**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	1
Productivity (ton/ha)	1,2
Total Production (kg)	**1200**
Storage Losses	10,44%
Total Losses (kg)	**125,28**

Maize Inventory Analysis (kg)	
Beginning Inventory	1200
Amount Lost	125,28
Ending Inventory	**1074,72**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	1074,72	1074,72
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	1074,72	1074,72
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	20.777,92	20.777,92
Household net Income (MZN)	**0**	**0**	**0**	**20.777,92**	**20.777,92**

CBA Improved Granary

Total Production (kg) 1200
Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Granary Costs

Granary Capacity (kg)	350
n° Granary Needed	3,4

Inflation Rate 2014-2016		25,20%
	2014	**2016**
Mud	40	50,08
Timber Strips	50	62,60
Timber Platform	100	125,20
Timber Walls	100	125,20
Timber Roof	50	62,60
Grass Roof	35	43,82
Bamboo Antirat	30	37,56
Labour 10dd	500	626,00

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Mud	-172			-172			-172			-172			-172			-172			-172		
Timber Strips	-215			-215			-215			-215			-215			-215			-215		
Timber Platform	-429			-429			-429			-429			-429			-429			-429		
Timber Walls	-429			-429			-429			-429			-429			-429			-429		
Timber Roof	-215			-215			-215			-215			-215			-215			-215		
Grass Roof	-150			-150			-150			-150			-150			-150			-150		
Bamboo Antirat	-129			-129			-129			-129			-129			-129			-129		
Labour 10dd	-2.146			-2.146			-2.146			-2.146			-2.146			-2.146			-2.146		
Total Cost	**-3.885**	**0**	**0**	**-3.885**	**0**	**0**	**-3.885**	**0**	**0**	**-3.885**	**0**	**0**	**-3.885**	**0**	**0**	**-3.885**	**0**	**0**	**-3.885**	**0**	**-27.193**
Selling_Income	20.778	20.778	20.778	20.778	20.778	20.778	20.778	20.778	20.778	20.778	20.778	20.778	20.778	20.778	20.778	20.778	20.778	20.778	20.778	20.778	415.558
Net Benefit	**16.893**	**20.778**	**20.778**	**16.893**	**20.778**	**20.778**	**16.893**	**20.778**	**20.778**	**16.893**	**20.778**	**20.778**	**16.893**	**20.778**	**20.778**	**16.893**	**20.778**	**20.778**	**16.893**	**20.778**	**388.365**
Adjusted Values (annual Inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-3.884,78	0,00	0,00	-6.622,68	0,00	0,00	-11.290,19	0,00	0,00	-19.247,25	0,00	0,00	-32.812,27	0,00	0,00	-55.937,59	0,00	0,00	-95.361,11	0,00	-225.156
Adj Income	20.777,92	24.821,30	29.651,53	35.421,72	42.314,78	50.549,24	60.386,12	72.137,26	86.175,17	102.944,86	122.977,93	146.909,43	175.498,01	209.649,92	250.447,80	299.184,94	357.406,33	426.957,60	510.043,55	609.298,02	3.633.553
Adj Net Benefit	**16.893,14**	**24.821,30**	**29.651,53**	**28.799,04**	**42.314,78**	**50.549,24**	**49.095,93**	**72.137,26**	**86.175,17**	**83.697,61**	**122.977,93**	**146.909,43**	**142.685,74**	**209.649,92**	**250.447,80**	**243.247,35**	**357.406,33**	**426.957,60**	**414.682,44**	**609.298,02**	**3.408.398**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-3.884,78	0,00	0,00	-4.215,55	0,00	0,00	-4.574,50	0,00	0,00	-4.964,00	0,00	0,00	-5.386,67	0,00	0,00	-5.845,33	0,00	0,00	-6.343,05	0,00	-35.214
Act Income	20.777,92	21.351,66	21.941,24	22.547,10	23.169,69	23.809,47	24.466,92	25.142,53	25.836,78	26.550,21	27.283,34	28.036,71	28.810,89	29.606,44	30.423,96	31.264,05	32.127,35	33.014,48	33.926,10	34.862,90	544.950
Act Benefit	**16.893,14**	**21.351,66**	**21.941,24**	**18.331,55**	**23.169,69**	**23.809,47**	**19.892,43**	**25.142,53**	**25.836,78**	**21.586,21**	**27.283,34**	**28.036,71**	**23.424,21**	**29.606,44**	**30.423,96**	**25.418,72**	**32.127,35**	**33.014,48**	**27.583,05**	**34.862,90**	**509.736**

NPV 509.736 MZN
BCR 15,48

CBA Polypropylene Bag without treatment

Total Production (kg) **350**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	0,7
Total Production (kg)	**350**
Storage Losses	5,78%
Total Losses (kg)	**20,23**

Household Income Analysis Input Table					
	May-Jul	**Aug-Oct**	**Nov-Jan**	**Feb-Apr**	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	329,77	0	0	0	329,77
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Maize Inventory Analysis (kg)	
Beginning Inventory	350
Amount Lost	20,23
Ending Inventory	**329,77**

Household Income Analysis					
Amount Sold (kg)	329,77	0,00	0,00	0,00	329,77
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from sales (MZN)	3133	0	0	0,00	3.132,82
Household net income (MZN)	**3133**	**0**	**0**	**0,00**	**3.132,82**

CBA Polypropylene Bag without treatment

Total Production (kg) **350**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
Acquisition Price (MZN)	17
Bag Capacity (kg)	50
n° bags	7
Tot Cost Bags	119

Accessory Costs	
Inflation Rate 2014-2016	25,20%

	cost/bag	final cost
	2014	**2016**	
Bamboo Strip	20	25,04	175,28
Timber	20	25,04	175,28
Plastic Cover	36	45,07	315,504
Local Labor	10	12,52	87,64

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bag Acquisition	-119		-119		-119		-119		-119		-119		-119		-119		-119		-119		
Bamboo Strips	-175		-175		-175		-175		-175		-175		-175		-175		-175		-175		
Timber	-175		-175		-175		-175		-175		-175		-175		-175		-175		-175		
Plastic Cover	-316		-316		-316		-316		-316		-316		-316		-316		-316		-316		
Local Labour	-88		-88		-88		-88		-88		-88		-88		-88		-88		-88		
Tot Cost	**-873**	**0**	**-873**	**0**	**-873**	**0**	**-873**	**0**	**-873**	**0**	**-873**	**0**	**-873**	**0**	**-873**	**0**	**-873**	**0**	**-873**	**0**	**-8.727**
Selling Income	3.133	3.133	3.133	3.133	3.133	3.133	3.133	3.133	3.133	3.133	3.133	3.133	3.133	3.133	3.133	3.133	3.133	3.133	3.133	3.133	62.656
Net Benefit	**2.260**	**3.133**	**2.260**	**3.133**	**2.260**	**3.133**	**2.260**	**3.133**	**2.260**	**3.133**	**2.260**	**3.133**	**2.260**	**3.133**	**2.260**	**3.133**	**2.260**	**3.133**	**2.260**	**3.133**	**53.929**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-872,70	0,00	-1.245,41	0,00	-1.777,28	0,00	-2.536,31	0,00	-3.619,49	0,00	-5.165,26	0,00	-7.371,18	0,00	-10.519,19	0,00	-15.011,61	0,00	-21.422,60	0,00	-69.541
Adj Income	3.132,82	3.742,46	4.470,74	5.340,75	6.380,06	7.621,62	9.104,79	10.876,58	12.993,16	15.521,63	18.542,14	22.150,44	26.460,92	31.610,21	37.761,56	45.109,96	53.888,35	64.375,03	76.902,41	91.867,62	547.853
Adj Net Benefit	**2.260,11**	**3.742,46**	**3.225,33**	**5.340,75**	**4.602,78**	**7.621,62**	**6.568,48**	**10.876,58**	**9.373,67**	**15.521,63**	**13.376,88**	**22.150,44**	**19.089,73**	**31.610,21**	**27.242,37**	**45.109,96**	**38.876,75**	**64.375,03**	**55.479,81**	**91.867,62**	**478.312**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-872,70	0,00	-921,57	0,00	-973,16	0,00	-1.027,65	0,00	-1.085,18	0,00	-1.145,94	0,00	-1.210,10	0,00	-1.277,85	0,00	-1.349,40	0,00	-1.424,95	0,00	-11.289
Act Income	3.132,82	3.219,32	3.308,22	3.399,57	3.493,44	3.589,90	3.689,03	3.790,89	3.895,57	4.003,14	4.113,68	4.227,27	4.344,00	4.463,95	4.587,21	4.713,87	4.844,04	4.977,80	5.115,25	5.256,49	82.165
Act Benefit	**2.260,11**	**3.219,32**	**2.386,65**	**3.399,57**	**2.520,28**	**3.589,90**	**2.661,38**	**3.790,89**	**2.810,39**	**4.003,14**	**2.967,74**	**4.227,27**	**3.133,89**	**4.463,95**	**3.309,36**	**4.713,87**	**3.494,64**	**4.977,80**	**3.690,30**	**5.256,49**	**70.877**

NPV	70.877 MZN
BCR	7,28

CBA Polypropylene Bag without treatment

Total Production (kg) **350**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	0,7
Total Production (kg)	**350**
Storage Losses	0,0578
Total Losses (kg)	**20,23**

Maize Inventory Analysis (kg)	
Beginning Inventory	350
Amount Lost	20,23
Ending Inventory	**329,77**

Household Income Analysis Input Table					
	May-Jul	**Aug-Oct**	**Nov-Jan**	**Feb-Apr**	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	329,77	329,77
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	329,77	329,77
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	6.375,55	6.375,55
Household net Income (MZN)	**0**	**0**	**0**	**6.375,55**	**6.375,55**

CBA Polypropylene Bag without treatment

Total Production (kg) **350**

Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
Acquisition Price (MZN)	17
Bag Capacity (kg)	50
n° bags	7
Total Cost Bags	119

Accessory Costs	
Inflation Rate 2014-2016	25,20%

	cost/bag		final cost
	2014	**2016**	
Bamboo Strips	20	25,04	175,28
Timber	20	25,04	175,28
Plastic Cover	36	45,07	315,504
Local Labor	10	12,52	87,64

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bag Acquisition	-119		-119		-119		-119		-119		-119		-119		-119		-119		-119		
Bamboo Strips	-175		-175		-175		-175		-175		-175		-175		-175		-175		-175		
Timber	-175		-175		-175		-175		-175		-175		-175		-175		-175		-175		
Plastic Cover	-316		-316		-316		-316		-316		-316		-316		-316		-316		-316		
Local Labour	-88		-88		-88		-88		-88		-88		-88		-88		-88		-88		
Total Cost	**-873**	**0**	**-873**	**0**	**-873**	**0**	**-873**	**0**	**-873**	**0**	**-873**	**0**	**-873**	**0**	**-873**	**0**	**-873**	**0**	**-873**	**0**	**-8.727**
Selling Income	6.376	6.376	6.376	6.376	6.376	6.376	6.376	6.376	6.376	6.376	6.376	6.376	6.376	6.376	6.376	6.376	6.376	6.376	6.376	6.376	127.511
Net Benefit	**5.503**	**6.376**	**5.503**	**6.376**	**5.503**	**6.376**	**5.503**	**6.376**	**5.503**	**6.376**	**5.503**	**6.376**	**5.503**	**6.376**	**5.503**	**6.376**	**5.503**	**6.376**	**5.503**	**6.376**	**118.784**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-872,70	0,00	-1.245,41	0,00	-1.777,28	0,00	-2.536,31	0,00	-3.619,49	0,00	-5.165,26	0,00	-7.371,18	0,00	-10.519,19	0,00	-15.011,61	0,00	-21.422,60	0,00	-69.541
Adj Income	6.375,55	7.616,24	9.098,36	10.868,90	12.983,98	15.510,67	18.529,04	22.134,79	26.442,22	31.587,88	37.734,88	45.078,09	53.850,29	64.329,55	76.848,08	91.802,72	109.667,53	131.008,83	156.503,15	186.958,66	1.114.929
Adj Net Benefit	**5.502,85**	**7.616,24**	**7.852,95**	**10.868,90**	**11.206,70**	**15.510,67**	**15.992,73**	**22.134,79**	**22.822,74**	**31.587,88**	**32.569,62**	**45.078,09**	**46.479,10**	**64.329,55**	**66.328,90**	**91.802,72**	**94.655,92**	**131.008,83**	**135.080,55**	**186.958,66**	**1.045.388**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-872,70	0,00	-921,57	0,00	-973,16	0,00	-1.027,65	0,00	-1.085,18	0,00	-1.145,94	0,00	-1.210,10	0,00	-1.277,85	0,00	-1.349,40	0,00	-1.424,95	0,00	-11.289
Act Income	6.375,55	6.551,60	6.732,51	6.918,41	7.109,45	7.305,76	7.507,50	7.714,80	7.927,83	8.146,74	8.371,69	8.602,86	8.840,41	9.084,52	9.335,37	9.593,15	9.858,04	10.130,25	10.409,98	10.697,43	167.214
Act Benefit	**5.502,85**	**6.551,60**	**5.810,94**	**6.918,41**	**6.136,29**	**7.305,76**	**6.479,85**	**7.714,80**	**6.842,65**	**8.146,74**	**7.225,75**	**8.602,86**	**7.630,31**	**9.084,52**	**8.057,52**	**9.593,15**	**8.508,64**	**10.130,25**	**8.985,03**	**10.697,43**	**155.925**

NPV	155.925 MZN
BCR	14,81

CBA Polypropylene Bag without treatment

Total Production (kg) **600**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	1,2
Total Production (kg)	**600**
Storage Losses	5,78%
Total Losses (kg)	**34,68**

Maize Inventory Analysis (kg)	
Beginning Inventory	600
Amount Lost	34,68
Ending Inventory	**565,32**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	565,32	0	0	0	565,32
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	565,32	0,00	0,00	0,00	565,32
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from sales (MZN)	5371	0	0	0,00	5.370,54
Household net income (MZN)	**5371**	**0**	**0**	**0,00**	**5.370,54**

CBA Polypropylene Bag without treatment

Total Production (kg) **600**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
Acquisition Price (MZN)	17
Bag Capacity (kg)	50
n° bags	12
Tot Cost Bags	204

Accessory Costs		
Inflation Rate 2014-2016	25,20%	
cost/bag		final cost
	2014	**2016**	
Bamboo Strips	20	25,04	300,48
Timber	20	25,04	300,48
Plastic Cover	36	45,07	540,864
Local Labor	10	12,52	150,24

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted Values)																					
Bag Acquisition	-204		-204		-204		-204		-204		-204		-204		-204		-204		-204		
Bamboo Strips	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Timber	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Plastic Cover	-541		-541		-541		-541		-541		-541		-541		-541		-541		-541		
Local Labour	-150		-150		-150		-150		-150		-150		-150		-150		-150		-150		
Tot Cost	**-1.496**	**0**	**-1.496**	**0**	**-1.496**	**0**	**-1.496**	**0**	**-1.496**	**0**	**-1.496**	**0**	**-1.496**	**0**	**-1.496**	**0**	**-1.496**	**0**	**-1.496**	**0**	**-14.961**
Selling Income	5.371	5.371	5.371	5.371	5.371	5.371	5.371	5.371	5.371	5.371	5.371	5.371	5.371	5.371	5.371	5.371	5.371	5.371	5.371	5.371	107.411
Net Benefit	**3.874**	**5.371**	**3.874**	**5.371**	**3.874**	**5.371**	**3.874**	**5.371**	**3.874**	**5.371**	**3.874**	**5.371**	**3.874**	**5.371**	**3.874**	**5.371**	**3.874**	**5.371**	**3.874**	**5.371**	**92.450**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-1.496,06	0,00	-2.134,99	0,00	-3.046,77	0,00	-4.347,96	0,00	-6.204,84	0,00	-8.854,73	0,00	-12.636,31	0,00	-18.032,89	0,00	-25.734,18	0,00	-36.724,46	0,00	-119.213
Adj Income	5.370,54	6.415,65	7.664,13	9.155,57	10.937,25	13.065,63	15.608,21	18.645,56	22.273,99	26.608,51	31.786,53	37.972,18	45.361,57	54.188,93	64.734,10	77.331,35	92.380,03	110.357,19	131.832,70	157.487,34	939.177
Adj Net Benefit	**3.874,48**	**6.415,65**	**5.529,15**	**9.155,57**	**7.890,47**	**13.065,63**	**11.260,25**	**18.645,56**	**16.069,16**	**26.608,51**	**22.931,80**	**37.972,18**	**32.725,26**	**54.188,93**	**46.701,21**	**77.331,35**	**66.645,85**	**110.357,19**	**95.108,24**	**157.487,34**	**819.964**
Actualized Values (discount rate: r=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-1.496,06	0,00	-1.579,83	0,00	-1.668,28	0,00	-1.761,68	0,00	-1.860,32	0,00	-1.964,47	0,00	-2.074,46	0,00	-2.190,60	0,00	-2.313,25	0,00	-2.442,77	0,00	-19.352
Act Income	5.370,54	5.518,84	5.671,23	5.827,83	5.988,75	6.154,12	6.324,05	6.498,67	6.678,12	6.862,52	7.052,02	7.246,75	7.446,85	7.652,48	7.863,79	8.080,93	8.304,06	8.533,36	8.769,00	9.011,13	140.855
Act Benefit	**3.874,48**	**5.518,84**	**4.091,40**	**5.827,83**	**4.320,47**	**6.154,12**	**4.562,37**	**6.498,67**	**4.817,81**	**6.862,52**	**5.087,55**	**7.246,75**	**5.372,39**	**7.652,48**	**5.673,18**	**8.080,93**	**5.990,81**	**8.533,36**	**6.326,23**	**9.011,13**	**121.503**

NPV	121.503 MZN
BCR	7,28

CBA Polypropylene Bag without treatment

Total Production (kg) **600**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	1,2
Total Production (kg)	**600**
Storage Losses	5,78%
Total Losses (kg)	**34,68**

Maize Inventory Analysis (kg)	
Beginning Inventory	600
Amount Lost	34,68
Ending Inventory	**565,32**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	565,32	565,32
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	565,32	565,32
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	10.929,52	10.929,52
Household net income (MZN)	**0**	**0**	**0**	**10.929,52**	**10.929,52**

CBA Polypropylene Bag without treatment

Total Production (kg) **600**

Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
Acquisition Price (MZN)	17
Bag Capacity (kg)	50
n° bags	12
Tot Cost Bags	204

Accessory Costs	
Inflation Rate 2014-2016	25,20%

	cost/bag	final cost
	2014	**2016**
Bamboo Strips	20	25,04	300,48
Timber	20	25,04	300,48
Plastic Cover	36	45,07	540,864
Local Labor	10	12,52	150,24

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted Values)																					
Bag Acquisition	-204		-204		-204		-204		-204		-204		-204		-204		-204		-204		
Bamboo Strips	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Timber	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Plastic Cover	-541		-541		-541		-541		-541		-541		-541		-541		-541		-541		
Local Labour	-150		-150		-150		-150		-150		-150		-150		-150		-150		-150		
Tot Cost	**-1.496**	**0**	**-1.496**	**0**	**-1.496**	**0**	**-1.496**	**0**	**-1.496**	**0**	**-1.496**	**0**	**-1.496**	**0**	**-1.496**	**0**	**-1.496**	**0**	**-1.496**	**0**	**-14.961**
Selling Income	10.930	10.930	10.930	10.930	10.930	10.930	10.930	10.930	10.930	10.930	10.930	10.930	10.930	10.930	10.930	10.930	10.930	10.930	10.930	10.930	218.590
Net Benefit	**9.433**	**10.930**	**9.433**	**10.930**	**9.433**	**10.930**	**9.433**	**10.930**	**9.433**	**10.930**	**9.433**	**10.930**	**9.433**	**10.930**	**9.433**	**10.930**	**9.433**	**10.930**	**9.433**	**10.930**	**203.630**
Adjusted Values (annual Inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-1.496,06	0,00	-2.134,99	0,00	-3.046,77	0,00	-4.347,96	0,00	-6.204,84	0,00	-8.854,73	0,00	-12.636,31	0,00	-18.032,89	0,00	-25.734,18	0,00	-36.724,46	0,00	-119.213
Adj Income	10.929,52	13.056,40	15.597,18	18.632,39	22.258,26	26.589,71	31.764,07	37.945,36	45.329,53	54.150,65	64.688,37	77.276,72	92.314,77	110.279,23	131.739,57	157.376,09	188.001,47	224.586,56	268.291,11	320.500,56	1.911.308
Adj Net Benefit	**9.433,46**	**13.056,40**	**13.462,19**	**18.632,39**	**19.211,48**	**26.589,71**	**27.416,11**	**37.945,36**	**39.124,69**	**54.150,65**	**55.833,64**	**77.276,72**	**79.678,46**	**110.279,23**	**113.706,68**	**157.376,09**	**162.267,29**	**224.586,56**	**231.566,65**	**320.500,56**	**1.792.094**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-1.496,06	0,00	-1.579,83	0,00	-1.668,28	0,00	-1.761,68	0,00	-1.860,32	0,00	-1.964,47	0,00	-2.074,46	0,00	-2.190,60	0,00	-2.313,25	0,00	-2.442,77	0,00	-19.352
Act Income	10.929,52	11.231,32	11.541,45	11.860,14	12.187,63	12.524,17	12.870,00	13.225,37	13.590,56	13.965,84	14.351,48	14.747,76	15.154,99	15.573,46	16.003,49	16.445,40	16.899,50	17.366,14	17.845,67	18.338,45	286.652
Act Benefit	**9.433,46**	**11.231,32**	**9.961,62**	**11.860,14**	**10.519,35**	**12.524,17**	**11.108,31**	**13.225,37**	**11.730,25**	**13.965,84**	**12.387,01**	**14.747,76**	**13.080,53**	**15.573,46**	**13.812,89**	**16.445,40**	**14.586,25**	**17.366,14**	**15.402,91**	**18.338,45**	**267.301**

NPV	267.301 MZN
BCR	14,81

CBA Polypropylene Bag without treatment

Total Production (kg) **900**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,75
Productivity (ton/ha)	1,2
Total Production (kg)	**900**
Storage Losses	5,78%
Tot Losses (kg)	**52,02**

Maize Inventory Analysis (kg)	
Beginning Inventory	900
Amount Lost	52,02
Ending Inventory	**847,98**

Household Income Analysis Input Table					
	May-Jul	**Aug-Oct**	**Nov-Jan**	**Feb-Apr**	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	847,98	0	0	0	847,98
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	847,98	0,00	0,00	0,00	847,98
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from sales (MZN)	8056	0	0	0,00	8.055,81
Household net income (MZN)	**8056**	**0**	**0**	**0,00**	**8.055,81**

CBA Polypropylene Bag without treatment

Total Production (kg) **900**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
Acquisition Price (MZN)	17
Bag Capacity (kg)	50
n° bags	18
Tot Cost Bags	306

Accessory Costs			
Inflation Rate 2014-2016	25,20%		
	cost/bag		final cost
	2014	**2016**	
Bamboo Strips	20	25,04	450,72
Timber	20	25,04	450,72
Plastic Cover	36	45,07	811,296
Local Labor	10	12,52	225,36

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted Values)																					
Bag Acquisition	-306		-306		-306		-306		-306		-306		-306		-306		-306		-306		
Bamboo Strips	-451		-451		-451		-451		-451		-451		-451		-451		-451		-451		
Timber	-451		-451		-451		-451		-451		-451		-451		-451		-451		-451		
Plastic Cover	-811		-811		-811		-811		-811		-811		-811		-811		-811		-811		
Local Labour	-225		-225		-225		-225		-225		-225		-225		-225		-225		-225		
Tot Cost	**-2.244**	**0**	**-2.244**	**0**	**-2.244**	**0**	**-2.244**	**0**	**-2.244**	**0**	**-2.244**	**0**	**-2.244**	**0**	**-2.244**	**0**	**-2.244**	**0**	**-2.244**	**0**	**-22.441**
Selling Income	8.056	8.056	8.056	8.056	8.056	8.056	8.056	8.056	8.056	8.056	8.056	8.056	8.056	8.056	8.056	8.056	8.056	8.056	8.056	8.056	161.116
Net Benefit	**5.812**	**8.056**	**5.812**	**8.056**	**5.812**	**8.056**	**5.812**	**8.056**	**5.812**	**8.056**	**5.812**	**8.056**	**5.812**	**8.056**	**5.812**	**8.056**	**5.812**	**8.056**	**5.812**	**8.056**	**138.675**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-2.244,10	0,00	-3.202,48	0,00	-4.570,16	0,00	-6.521,94	0,00	-9.307,25	0,00	-13.282,09	0,00	-18.954,47	0,00	-27.049,33	0,00	-38.601,27	0,00	-55.086,68	0,00	-178.820
Adj Income	8.055,81	9.623,47	11.496,20	13.733,36	16.405,87	19.598,45	23.412,31	27.968,35	33.410,99	39.912,76	47.679,79	56.958,28	68.042,36	81.283,40	97.101,15	115.997,03	138.570,05	165.535,78	197.749,05	236.231,01	1.408.765
Adj Net Benefit	**5.811,71**	**9.623,47**	**8.293,72**	**13.733,36**	**11.835,71**	**19.598,45**	**16.890,38**	**27.968,35**	**24.103,73**	**39.912,76**	**34.397,69**	**56.958,28**	**49.087,89**	**81.283,40**	**70.051,81**	**115.997,03**	**99.968,78**	**165.535,78**	**142.662,37**	**236.231,01**	**1.229.946**
Actualized Values (discount rate: r=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-2.244,10	0,00	-2.369,74	0,00	-2.502,42	0,00	-2.642,52	0,00	-2.790,47	0,00	-2.946,71	0,00	-3.111,69	0,00	-3.285,91	0,00	-3.469,88	0,00	-3.664,15	0,00	-29.028
Act Income	8.055,81	8.278,25	8.506,84	8.741,74	8.983,12	9.231,17	9.486,07	9.748,01	10.017,18	10.293,79	10.578,03	10.870,12	11.170,27	11.478,72	11.795,68	12.121,39	12.456,10	12.800,05	13.153,49	13.516,70	211.283
Act Benefit	**5.811,71**	**8.278,25**	**6.137,10**	**8.741,74**	**6.480,71**	**9.231,17**	**6.843,55**	**9.748,01**	**7.226,71**	**10.293,79**	**7.631,32**	**10.870,12**	**8.058,59**	**11.478,72**	**8.509,77**	**12.121,39**	**8.986,22**	**12.800,05**	**9.489,34**	**13.516,70**	**182.255**

NPV	182.255 MZN
BCR	7,28

CBA Polypropylene Bag without treatment

Total Production (kg) **900**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,75
Productivity (ton/ha)	1,2
Total Production (kg)	**900**
Storage Losses	5,78%
Total Losses (kg)	**52,02**

Maize Inventory Analysis (kg)	
Beginning Inventory	900
Amount Lost	52,02
Ending Inventory	**847,98**

Household Income Analysis Input Table					
	May-Jul	**Aug-Oct**	**Nov-Jan**	**Feb-Apr**	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	847,98	847,98
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	847,98	847,98
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	16.394,28	16.394,28
Household net Income (MZN)	**0**	**0**	**0**	**16.394,28**	**16.394,28**

CBA Polypropylene Bag without treatment

Total Production (kg) **900**

Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
Acquisition Price (MZN)	17
Bag Capacity (kg)	50
n° bags	18
Tot Cost Bags	306

Accessory Costs		
Inflation Rate 2014-2016	25,20%	
cost/bag		final cost
	2014	**2016**
Bamboo Strip	20	25,04	450,72
Timber	20	25,04	450,72
Plastic Cover	36	45,07	811,296
Local Labor	10	12,52	225,36

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bag Acquisition	-306		-306		-306		-306		-306		-306		-306		-306		-306		-306		
Bamboo Strips	-451		-451		-451		-451		-451		-451		-451		-451		-451		-451		
Timber	-451		-451		-451		-451		-451		-451		-451		-451		-451		-451		
Plastic Cover	-811		-811		-811		-811		-811		-811		-811		-811		-811		-811		
Local Labour	-225		-225		-225		-225		-225		-225		-225		-225		-225		-225		
Tot Cost	**-2.244**	**0**	**-2.244**	**0**	**-2.244**	**0**	**-2.244**	**0**	**-2.244**	**0**	**-2.244**	**0**	**-2.244**	**0**	**-2.244**	**0**	**-2.244**	**0**	**-2.244**	**0**	**-22.441**
Selling Income	16.394	16.394	16.394	16.394	16.394	16.394	16.394	16.394	16.394	16.394	16.394	16.394	16.394	16.394	16.394	16.394	16.394	16.394	16.394	16.394	327.886
Net Benefit	**14.150**	**16.394**	**14.150**	**16.394**	**14.150**	**16.394**	**14.150**	**16.394**	**14.150**	**16.394**	**14.150**	**16.394**	**14.150**	**16.394**	**14.150**	**16.394**	**14.150**	**16.394**	**14.150**	**16.394**	**305.445**
Adjusted Values (annual Inflation rate: =19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-2.244,10	0,00	-3.202,48	0,00	-4.570,16	0,00	-6.521,94	0,00	-9.307,25	0,00	-13.282,09	0,00	-18.954,47	0,00	-27.049,33	0,00	-38.601,27	0,00	-55.086,68	0,00	-178.820
Adj Income	16.394,28	19.584,61	23.395,77	27.948,59	33.387,38	39.884,57	47.646,11	56.918,04	67.994,29	81.225,98	97.032,55	115.915,09	138.472,16	165.418,84	197.609,35	236.064,13	282.002,21	336.879,84	402.436,66	480.750,83	2.866.961
Adj Net Benefit	**14.150,18**	**19.584,61**	**20.193,29**	**27.948,59**	**28.817,22**	**39.884,57**	**41.124,17**	**56.918,04**	**58.687,04**	**81.225,98**	**83.750,46**	**115.915,09**	**119.517,70**	**165.418,84**	**170.560,02**	**236.064,13**	**243.400,94**	**336.879,84**	**347.349,98**	**480.750,83**	**2.688.142**
Actualized Values (discount rate: =16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-2.244,10	0,00	-2.369,74	0,00	-2.502,42	0,00	-2.642,52	0,00	-2.790,47	0,00	-2.946,71	0,00	-3.111,69	0,00	-3.285,91	0,00	-3.469,88	0,00	-3.664,15	0,00	-29.028
Act Income	16.394,28	16.846,97	17.312,17	17.790,21	18.281,45	18.786,25	19.304,99	19.838,06	20.385,85	20.948,76	21.527,21	22.121,64	22.732,49	23.360,20	24.005,24	24.668,09	25.349,25	26.049,22	26.768,51	27.507,67	429.979
Act Benefit	**14.150,18**	**16.846,97**	**14.942,43**	**17.790,21**	**15.779,03**	**18.786,25**	**16.662,47**	**19.838,06**	**17.595,37**	**20.948,76**	**18.580,51**	**22.121,64**	**19.620,80**	**23.360,20**	**20.719,33**	**24.668,09**	**21.879,37**	**26.049,22**	**23.104,36**	**27.507,67**	**400.951**

NPV	400.951 MZN
BCR	14,81

CBA Polypropylene Bag without treatment

Total Production (kg) **1200**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	1
Productivity (ton/ha)	1,2
Total Production (kg)	**1200**
Storage Losses	5,78%
Total Losses (kg)	**69,36**

Maize Inventory Analysis (kg)	
Beginning Inventory	1200
Amount Lost	69,36
Ending Inventory	**1130,64**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	1130,64	0	0	0	1130,64
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	1130,64	0,00	0,00	0,00	1130,64
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from sales (MZN)	10741	0	0	0,00	10.741,08
Household net income (MZN)	**10741**	**0**	**0**	**0,00**	**10.741,08**

CBA Polypropylene Bag without treatment

Total Production (kg) **1200**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
Acquisition Price (MZN)	17
Bag Capacity (kg)	50
n° bags	24
Tot Cost Bags	408

Accessory Costs			
Inflation Rate 2014-2016	25,20%		
	cost/bag		final cost
	2014	**2016**	
Bamboo Strips	20	25,04	600,96
Timber	20	25,04	600,96
Plastic Cover	36	45,07	1081,728
Local Labor	10	12,52	300,48

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bag Acquisition	-408		-408		-408		-408		-408		-408		-408		-408		-408		-408		
Bamboo Strips	-601		-601		-601		-601		-601		-601		-601		-601		-601		-601		
Timber	-601		-601		-601		-601		-601		-601		-601		-601		-601		-601		
Plastic Cover	-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		
Local Labour	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Tot Cost	**-2.992**	**0**	**-2.992**	**0**	**-2.992**	**0**	**-2.992**	**0**	**-2.992**	**0**	**-2.992**	**0**	**-2.992**	**0**	**-2.992**	**0**	**-2.992**	**0**	**-2.992**	**0**	**-29.921**
Selling Income	10.741	10.741	10.741	10.741	10.741	10.741	10.741	10.741	10.741	10.741	10.741	10.741	10.741	10.741	10.741	10.741	10.741	10.741	10.741	10.741	214.822
Net Benefit	**7.749**	**10.741**	**7.749**	**10.741**	**7.749**	**10.741**	**7.749**	**10.741**	**7.749**	**10.741**	**7.749**	**10.741**	**7.749**	**10.741**	**7.749**	**10.741**	**7.749**	**10.741**	**7.749**	**10.741**	**184.900**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-2.992,13	0,00	-4.269,97	0,00	-6.093,55	0,00	-8.695,91	0,00	-12.409,67	0,00	-17.709,46	0,00	-25.272,62	0,00	-36.065,78	0,00	-51.468,36	0,00	-73.448,91	0,00	-238.426
Adj Income	10.741,08	12.831,29	15.328,26	18.311,14	21.874,49	26.131,27	31.216,41	37.291,13	44.547,98	53.217,02	63.573,05	75.944,37	90.723,14	108.377,86	129.468,20	154.662,71	184.760,07	220.714,38	263.665,40	314.974,68	1.878.354
Adj Net Benefit	**7.748,95**	**12.831,29**	**11.058,29**	**18.311,14**	**15.780,95**	**26.131,27**	**22.520,50**	**37.291,13**	**32.138,31**	**53.217,02**	**45.863,59**	**75.944,37**	**65.450,52**	**108.377,86**	**93.402,42**	**154.662,71**	**133.291,71**	**220.714,38**	**190.216,49**	**314.974,68**	**1.639.928**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-2.992,13	0,00	-3.159,65	0,00	-3.336,56	0,00	-3.523,36	0,00	-3.720,63	0,00	-3.928,94	0,00	-4.148,92	0,00	-4.381,21	0,00	-4.626,50	0,00	-4.885,53	0,00	-38.703
Act Income	10.741,08	11.037,67	11.342,45	11.655,65	11.977,50	12.308,23	12.648,10	12.997,35	13.356,24	13.725,05	14.104,04	14.493,49	14.893,70	15.304,96	15.727,57	16.161,85	16.608,13	17.066,73	17.537,99	18.022,27	281.710
Act Benefit	**7.748,95**	**11.037,67**	**8.182,80**	**11.655,65**	**8.640,94**	**12.308,23**	**9.124,74**	**12.997,35**	**9.635,61**	**13.725,05**	**10.175,09**	**14.493,49**	**10.744,78**	**15.304,96**	**11.346,36**	**16.161,85**	**11.981,63**	**17.066,73**	**12.652,46**	**18.022,27**	**243.007**

NPV	243.007 MZN
BCR	7,28

CBA Polypropylene Bag without treatment

Total Production (kg) **1200**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	1
Productivity (ton/ha)	1,2
Total Production (kg)	**1200**
Storage Losses	5,78%
Total Losses (kg)	**69,36**

Maize Inventory Analysis (kg)	
Beginning Inventory	1200
Amount Lost	69,36
Ending Inventory	**1130,64**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	1130,64	1130,64
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	1130,64	1130,64
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	21.859,04	21.859,04
Household net income (MZN)	**0**	**0**	**0**	**21.859,04**	**21.859,04**

CBA Polypropylene Bag without treatment

Total Production (kg) **1200**

Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
Acquisition Price (MZN)	17
Bag Capacity (kg)	50
n° bags	24
Total Cost Bags	408

Accessory Costs

Inflation Rate 2014-2016	25,20%

	cost/bag		final cost
	2014	**2016**	
Bamboo Strips	20	25,04	600,96
Timber	20	25,04	600,96
Plastic Cover	36	45,07	1081,728
Local Labor	10	12,52	300,48

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted Values)																					
Bag Acquisition	-408		-408		-408		-408		-408		-408		-408		-408		-408		-408		
Bamboo Strips	-601		-601		-601		-601		-601		-601		-601		-601		-601		-601		
Timber	-601		-601		-601		-601		-601		-601		-601		-601		-601		-601		
Plastic Cover	-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		
Local Labour	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Total Cost	**-2.992**	**0**	**-2.992**	**0**	**-2.992**	**0**	**-2.992**	**0**	**-2.992**	**0**	**-2.992**	**0**	**-2.992**	**0**	**-2.992**	**0**	**-2.992**	**0**	**-2.992**	**0**	**-29.921**
Selling Income	21.859	21.859	21.859	21.859	21.859	21.859	21.859	21.859	21.859	21.859	21.859	21.859	21.859	21.859	21.859	21.859	21.859	21.859	21.859	21.859	437.181
Net Benefit	**18.867**	**21.859**	**18.867**	**21.859**	**18.867**	**21.859**	**18.867**	**21.859**	**18.867**	**21.859**	**18.867**	**21.859**	**18.867**	**21.859**	**18.867**	**21.859**	**18.867**	**21.859**	**18.867**	**21.859**	**407.260**
Adjusted Values (annual Inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-2.992,13	0,00	-4.269,97	0,00	-6.093,55	0,00	-8.695,91	0,00	-12.409,67	0,00	-17.709,46	0,00	-25.272,62	0,00	-36.065,78	0,00	-51.468,36	0,00	-73.448,91	0,00	-238.426
Adj Income	21.859,04	26.112,81	31.194,36	37.264,78	44.516,51	53.179,42	63.528,14	75.890,72	90.659,05	108.301,30	129.376,74	154.553,45	184.629,55	220.558,46	263.479,14	314.752,18	376.002,95	449.173,12	536.582,21	641.001,11	3.822.615
Adj Net Benefit	**18.866,91**	**26.112,81**	**26.924,39**	**37.264,78**	**38.422,96**	**53.179,42**	**54.832,23**	**75.890,72**	**78.249,38**	**108.301,30**	**111.667,28**	**154.553,45**	**159.356,93**	**220.558,46**	**227.413,36**	**314.752,18**	**324.534,59**	**449.173,12**	**463.133,30**	**641.001,11**	**3.584.189**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-2.992,13	0,00	-3.159,65	0,00	-3.336,56	0,00	-3.523,36	0,00	-3.720,63	0,00	-3.928,94	0,00	-4.148,92	0,00	-4.381,21	0,00	-4.626,50	0,00	-4.885,53	0,00	-38.703
Act Income	21.859,04	22.462,63	23.082,89	23.720,28	24.375,26	25.048,33	25.739,99	26.450,75	27.181,13	27.931,68	28.702,95	29.495,52	30.309,98	31.146,93	32.006,99	32.890,79	33.799,00	34.732,29	35.691,35	36.676,89	573.305
Act Benefit	**18.866,91**	**22.462,63**	**19.923,24**	**23.720,28**	**21.038,71**	**25.048,33**	**22.216,63**	**26.450,75**	**23.460,50**	**27.931,68**	**24.774,01**	**29.495,52**	**26.161,06**	**31.146,93**	**27.625,78**	**32.890,79**	**29.172,50**	**34.732,29**	**30.805,82**	**36.676,89**	**534.601**

NPV	534.601 MZN
BCR	14,81

CBA Metal Silo

Total Production (kg) **350**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	0,7
Total Production (kg)	**350**
Storage Losses	2,04%
Tot Losses (kg)	**7,14**

Maize Inventory Analysis (kg)	
Beginning Inventory	350
Amount Lost	7,14
Ending Inventory	**342,86**

Household Income Analysis Input Table					
	May-Jul	**Aug-Oct**	**Nov-Jan**	**Feb-Apr**	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	342,86	0	0	0	342,86
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	342,86	0,00	0,00	0,00	342,86
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	3257	0	0	0,00	3.257,17
Household net income (MZN)	**3257**	**0**	**0**	**0,00**	**3.257,17**

CBA Metal Silo

Total Production (kg)	**350**
Worst Selling Scenario	

Discount Rate	16,25%
Inflation Rate	19,46%

Silo Capacity	400
Acquisition Price (MZN)	3200
Volume Filled	87,50%

Accessory Costs

Inflation Rate 2014-2016	25,20%

MZN/kg maize	final Cost

	2014	2016	
Candle Acquisition	0,04	0,05	20,03
Rubber Acquisition	1,00	1,25	500,80
Wooden Platform	0,40	0,50	200,32

Silo Prices

200 kg	2.600 MZN
400 kg	3.200 MZN
800 kg	4.600 MZN
1000 kg	5.300 MZN

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Silo Acquisition	-3.200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Candle Acquisition	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	
Rubber Acquisition	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	
Wooden Platform	-200	0	-200	0	-200	0	-200	0	-200	0	-200	0	-200	0	-200	0	-200	0	-200	0	
Total Cost	**-3.921**	**-20**	**-721**	**-20**	**-721**	**-20**	**-721**	**-20**	**-721**	**-20**	**-721**	**-20**	**-721**	**-20**	**-721**	**-20**	**-721**	**-20**	**-721**	**-20**	**-10.612**
Selling Income	3.257	3.257	3.257	3.257	3.257	3.257	3.257	3.257	3.257	3.257	3.257	3.257	3.257	3.257	3.257	3.257	3.257	3.257	3.257	3.257	65.143
Net Benefit	**-664**	**3.237**	**2.536**	**3.237**	**2.536**	**3.237**	**2.536**	**3.237**	**2.536**	**3.237**	**2.536**	**3.237**	**2.536**	**3.237**	**2.536**	**3.237**	**2.536**	**3.237**	**2.536**	**3.237**	**54.532**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-3.921,15	-23,93	-1.029,13	-34,15	-1.468,65	-48,73	-2.095,86	-69,55	-2.990,93	-99,25	-4.268,27	-141,64	-6.091,12	-202,12	-8.692,45	-288,44	-12.404,72	-411,63	-17.702,39	-587,42	-62.572
Adj Income	3.257,17	3.891,02	4.648,21	5.552,75	6.633,31	7.924,16	9.466,20	11.308,32	13.508,92	16.137,75	19.278,16	23.029,69	27.511,26	32.864,96	39.260,48	46.900,57	56.027,42	66.930,35	79.955,00	95.514,24	569.600
Adj Net Benefit	**-663,98**	**3.867,09**	**3.619,07**	**5.518,60**	**5.164,67**	**7.875,42**	**7.370,34**	**11.238,77**	**10.517,98**	**16.038,50**	**15.009,89**	**22.888,05**	**21.420,15**	**32.662,83**	**30.568,03**	**46.612,12**	**43.622,70**	**66.518,72**	**62.252,60**	**94.926,82**	**507.028**
Actualized Values (discount rate: r=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-3.921,15	-20,59	-761,53	-21,74	-804,16	-22,95	-849,19	-24,24	-896,73	-25,60	-946,94	-27,03	-999,96	-28,54	-1.055,94	-30,14	-1.115,06	-31,83	-1.177,49	-33,61	-12.794
Act Income	3.257,17	3.347,11	3.439,53	3.534,51	3.632,11	3.732,40	3.835,46	3.941,37	4.050,20	4.162,04	4.276,97	4.395,07	4.516,43	4.641,14	4.769,29	4.900,99	5.036,32	5.175,39	5.318,29	5.465,15	85.427
Act Benefit	**-663,98**	**3.326,52**	**2.678,01**	**3.512,77**	**2.827,94**	**3.709,45**	**2.986,27**	**3.917,13**	**3.153,47**	**4.136,44**	**3.330,03**	**4.368,04**	**3.516,47**	**4.612,60**	**3.713,35**	**4.870,85**	**3.921,26**	**5.143,56**	**4.140,80**	**5.431,54**	**72.632**

NPV	72.632 MZN
BCR	6,68

CBA Metal Silo

Total Production (kg) **350**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	0,7
Total Production (kg)	**350**
Storage Losses	2,04%
Total Losses (kg)	**7,14**

Maize Inventory Analysis (kg)	
Beginning Inventory	350
Amount Lost	7,14
Ending Inventory	**342,86**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	342,86	342,86
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	342,86	342,86
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from sales (MZN)	0	0	0	6.628,63	6.628,63
Household net income (MZN)	**0**	**0**	**0**	**6.628,63**	**6.628,63**

CBA Metal Silo

Total Production (kg) **350**

Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Silo Capacity	400
Acquisition Price (MZN)	3200
Volume Filled	87,50%

Accessory Costs

Inflation Rate 2014-2016	25,20%

MZN/kg maize	final cost

	2014	2016	
Candle Acquisition	0,04	0,05	20,03
Rubber Acquisition	1,00	1,25	500,80
Wooden Platform	0,40	0,50	200,32

Silo Prices

200 kg	2.600 MZN
400 kg	3.200 MZN
800 kg	4.600 MZN
1000 kg	5.300 MZN

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Silo Acquisition	-3.200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Candle Acquisition	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	
Rubber Acquisition	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	
Wooden Platform	-200	0	-200	0	-200	0	-200	0	-200	0	-200	0	-200	0	-200	0	-200	0	-200	0	
Total Cost	**-3.921**	**-20**	**-721**	**-20**	**-721**	**-20**	**-721**	**-20**	**-721**	**-20**	**-721**	**-20**	**-721**	**-20**	**-721**	**-20**	**-721**	**-20**	**-721**	**-20**	**-10.612**
Selling Income	6.629	6.629	6.629	6.629	6.629	6.629	6.629	6.629	6.629	6.629	6.629	6.629	6.629	6.629	6.629	6.629	6.629	6.629	6.629	6.629	132.573
Net Benefit	**2.707**	**6.609**	**5.907**	**6.609**	**5.907**	**6.609**	**5.907**	**6.609**	**5.907**	**6.609**	**5.907**	**6.609**	**5.907**	**6.609**	**5.907**	**6.609**	**5.907**	**6.609**	**5.907**	**6.609**	**121.961**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-3.921,15	-23,93	-1.029,13	-34,15	-1.468,65	-48,73	-2.095,86	-69,55	-2.990,93	-99,25	-4.268,27	-141,64	-6.091,12	-202,12	-8.692,45	-288,44	-12.404,72	-411,63	-17.702,39	-587,42	-62.572
Adj Income	6.628,63	7.918,56	9.459,51	11.300,33	13.499,37	16.126,35	19.264,54	23.013,42	27.491,83	32.841,74	39.232,74	46.867,43	55.987,84	66.883,07	79.898,51	95.446,77	114.020,71	136.209,14	162.715,43	194.379,86	1.159.186
Adj Net Benefit	**2.707,47**	**7.894,63**	**8.430,37**	**11.266,18**	**12.030,73**	**16.077,62**	**17.168,68**	**22.943,87**	**24.500,90**	**32.742,49**	**34.964,47**	**46.725,80**	**49.896,72**	**66.680,95**	**71.206,07**	**95.158,32**	**101.615,99**	**135.797,51**	**145.013,04**	**193.792,43**	**1.096.614**
Actualized Values (discount rate: r=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-3.921,15	-20,59	-761,53	-21,74	-804,16	-22,95	-849,19	-24,24	-896,73	-25,60	-946,94	-27,03	-999,96	-28,54	-1.055,94	-30,14	-1.115,06	-31,83	-1.177,49	-33,61	-12.794
Act Income	6.628,63	6.811,66	6.999,75	7.193,04	7.391,66	7.595,76	7.805,50	8.021,03	8.242,52	8.470,12	8.704,00	8.944,35	9.191,33	9.445,12	9.705,93	9.973,94	10.249,35	10.532,36	10.823,19	11.122,05	173.851
Act Benefit	**2.707,47**	**6.791,08**	**6.238,22**	**7.171,30**	**6.587,49**	**7.572,81**	**6.956,31**	**7.996,79**	**7.345,79**	**8.444,52**	**7.757,06**	**8.917,32**	**8.191,37**	**9.416,58**	**8.649,99**	**9.943,80**	**9.134,29**	**10.500,54**	**9.645,70**	**11.088,44**	**161.057**

NPV 161.057 MZN
BCR 13,59

CBA Metal Silo

Total Production (kg) **600**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	1,2
Total Production (kg)	**600**
Storage Losses	2,04%
Tot Losses (kg)	**12,24**

Maize Inventory Analysis (kg)	
Beginning Inventory	600
Amount Lost	12,24
Ending Inventory	**587,76**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	587,76	0	0	0	587,76
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	587,76	0,00	0,00	0,00	587,76
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	5584	0	0	0,00	5.583,72
Household net Income (MZN)	**5584**	**0**	**0**	**0,00**	**5.583,72**

CBA – Metal Silo

Total Production (kg) **600**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Silo Capacity	800
Acquisition Price (MZN)	4600
Volume Filled	75,00%

Accessory Costs		
Inflation Rate 2014-2016	25,20%	
MZN/kg maize		final cost

	2014	2016	
Candle Acquisition	0,04	0,05	40,06
Rubber Acquisition	1,00	1,25	1.001,60
Wooden Platform	0,40	0,50	400,64

Silo Prices

200 kg	2.600 MZN
400 kg	3.200 MZN
800 kg	4.600 MZN
1000 kg	5.300 MZN

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Silo Acquisition	-4.600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Candle Acquisition	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	
Rubber Acquisition	-1.002	0	-1.002	0	-1.002	0	-1.002	0	-1.002	0	-1.002	0	-1.002	0	-1.002	0	-1.002	0	-1.002	0	
Wooden Platform	-401	0	-401	0	-401	0	-401	0	-401	0	-401	0	-401	0	-401	0	-401	0	-401	0	
Total Cost	**-6.042**	**-40**	**-1.442**	**-40**	**-1.442**	**-40**	**-1.442**	**-40**	**-1.442**	**-40**	**-1.442**	**-40**	**-1.442**	**-40**	**-1.442**	**-40**	**-1.442**	**-40**	**-1.442**	**-40**	**-19.424**
Selling Income	5.584	5.584	5.584	5.584	5.584	5.584	5.584	5.584	5.584	5.584	5.584	5.584	5.584	5.584	5.584	5.584	5.584	5.584	5.584	5.584	111.674
Net Benefit	**-459**	**5.544**	**4.141**	**5.544**	**4.141**	**5.544**	**4.141**	**5.544**	**4.141**	**5.544**	**4.141**	**5.544**	**4.141**	**5.544**	**4.141**	**5.544**	**4.141**	**5.544**	**4.141**	**5.544**	**92.251**
Adjusted Values (annual Inflation Rate: =19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-6.042,30	-47,86	-2.058,27	-68,30	-2.937,29	-97,47	-4.191,72	-139,10	-5.981,87	-198,50	-8.536,54	-283,27	-12.182,23	-404,25	-17.384,89	-576,89	-24.809,44	-823,26	-35.404,79	-1.174,85	-123.343
Adj Income	5.583,72	6.670,31	7.968,35	9.519,00	11.371,39	13.584,27	16.227,76	19.385,69	23.158,14	27.664,72	33.048,27	39.479,46	47.162,17	56.339,93	67.303,67	80.400,97	96.047,00	114.737,74	137.065,71	163.738,70	976.457
Adj Net Benefit	**-458,58**	**6.622,45**	**5.910,09**	**9.450,70**	**8.434,10**	**13.486,80**	**12.036,05**	**19.246,59**	**17.176,27**	**27.466,22**	**24.511,73**	**39.196,19**	**34.979,93**	**55.935,68**	**49.918,78**	**79.824,08**	**71.237,56**	**113.914,48**	**101.660,92**	**162.563,85**	**853.114**
Actualized Values (discount Rate: =16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-6.042,30	-41,17	-1.523,06	-43,48	-1.608,33	-45,91	-1.698,38	-48,48	-1.793,47	-51,19	-1.893,88	-54,06	-1.999,91	-57,09	-2.111,89	-60,28	-2.230,13	-63,66	-2.354,99	-67,22	-23.789
Act Income	5.583,72	5.737,90	5.896,34	6.059,16	6.226,47	6.398,40	6.575,08	6.756,64	6.943,21	7.134,93	7.331,94	7.534,40	7.742,45	7.956,24	8.175,93	8.401,69	8.633,69	8.872,09	9.117,07	9.368,82	146.446
Act Benefit	**-458,58**	**5.696,73**	**4.373,29**	**6.015,68**	**4.618,14**	**6.352,49**	**4.876,70**	**6.708,16**	**5.149,74**	**7.083,73**	**5.438,06**	**7.480,34**	**5.742,53**	**7.899,15**	**6.064,05**	**8.341,41**	**6.403,56**	**8.808,43**	**6.762,09**	**9.301,60**	**122.657**

NPV	122.657 MZN
BCR	6,16

CBA Metal Silo

Total Production (kg) **600**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	1,2
Total Production (kg)	**600**
Storage Losses	2,04%
Tot Losses (kg)	**12,24**

Maize Inventory Analysis (kg)	
Beginning Inventory	600
Amount Lost	12,24
Ending Inventory	**587,76**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	587,76	587,76
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	587,76	587,76
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	11.363,36	11.363,36
Household net income (MZN)	**0**	**0**	**0**	**11.363,36**	**11.363,36**

CBA Metal Silo

Total Production (kg) **600**
Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Silo Capacity	800
Acquisition Price (MZN)	4600
Volume Filled	75,00%

Accessory Costs		
Inflation Rate 2014-2016	25,20%	
MZN/kg maize		final cost
	2014	**2016**
Candle Acquisition	0,04	0,05 40,06
Rubber Acquisition	1,00	1,25 1.001,60
Wooden Platform	0,40	0,50 400,64

Silo Prices

200 kg	2.600 MZN
400 kg	3.200 MZN
800 kg	4.600 MZN
1000 kg	5.300 MZN

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Tolal**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Silo Acquisition	-4.600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Candle Acquisition	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	
Rubber Acquisition	-1.002	0	-1.002	0	-1.002	0	-1.002	0	-1.002	0	-1.002	0	-1.002	0	-1.002	0	-1.002	0	-1.002	0	
Wooden Platform	-401	0	-401	0	-401	0	-401	0	-401	0	-401	0	-401	0	-401	0	-401	0	-401	0	
Total Cost	**-6.042**	**-40**	**-1.442**	**-40**	**-1.442**	**-40**	**-1.442**	**-40**	**-1.442**	**-40**	**-1.442**	**-40**	**-1.442**	**-40**	**-1.442**	**-40**	**-1.442**	**-40**	**-1.442**	**-40**	**-19.424**
Selling Income	11.363	11.363	11.363	11.363	11.363	11.363	11.363	11.363	11.363	11.363	11.363	11.363	11.363	11.363	11.363	11.363	11.363	11.363	11.363	11.363	227.267
Net Benefit	**5.321**	**11.323**	**9.921**	**11.323**	**9.921**	**11.323**	**9.921**	**11.323**	**9.921**	**11.323**	**9.921**	**11.323**	**9.921**	**11.323**	**9.921**	**11.323**	**9.921**	**11.323**	**9.921**	**11.323**	**207.844**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-6.042,30	-47,86	-2.058,27	-68,30	-2.937,29	-97,47	-4.191,72	-139,10	-5.981,87	-198,50	-8.536,54	-283,27	-12.182,23	-404,25	-17.384,89	-576,89	-24.809,44	-823,26	-35.404,79	-1.174,85	-123.343
Adj Income	11.363,36	13.574,67	16.216,30	19.371,99	23.141,78	27.645,17	33.024,92	39.451,57	47.128,85	56.300,13	67.256,13	80.344,17	95.979,15	114.656,69	136.968,88	163.623,03	195.464,07	233.501,38	278.940,74	333.222,61	1.987.176
Adj Net Benefit	**5.321,06**	**13.526,81**	**14.158,03**	**19.303,69**	**20.204,49**	**27.547,70**	**28.833,21**	**39.312,48**	**41.146,98**	**56.101,63**	**58.719,59**	**80.060,90**	**83.796,91**	**114.252,44**	**119.583,99**	**163.046,14**	**170.654,63**	**232.678,12**	**243.535,96**	**332.047,76**	**1.863.833**
Actualized Values (discount rate: r=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-6.042,30	-41,17	-1.523,06	-43,48	-1.608,33	-45,91	-1.698,38	-48,48	-1.793,47	-51,19	-1.893,88	-54,06	-1.999,91	-57,09	-2.111,89	-60,28	-2.230,13	-63,66	-2.354,99	-67,22	-23.789
Act Income	11.363,36	11.677,14	11.999,57	12.330,92	12.671,41	13.021,30	13.380,86	13.750,35	14.130,03	14.520,20	14.921,15	15.333,16	15.756,56	16.191,64	16.638,74	17.098,18	17.570,31	18.055,48	18.554,05	19.066,38	298.031
Act Benefit	**5.321,06**	**11.635,97**	**10.476,52**	**12.287,44**	**11.063,08**	**12.975,40**	**11.682,48**	**13.701,87**	**12.336,57**	**14.469,01**	**13.027,27**	**15.279,10**	**13.756,64**	**16.134,56**	**14.526,85**	**17.037,90**	**15.340,19**	**17.991,82**	**16.199,06**	**18.999,16**	**274.242**

NPV 274.242 MZN
BCR 12,53

CBA Metal Silo

Total Production (kg) **900**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,75
Productivity (ton/ha)	1,2
Total Production (kg)	**900**
Storage Losses	2,04%
Tot Losses (kg)	**18,36**

Maize Inventory Analysis (kg)	
Beginning Inventory	900
Amount Lost	18,36
Ending Inventory	**881,64**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	881,64	0	0	0	881,64
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	881,64	0,00	0,00	0,00	881,64
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	8376	0	0	0,00	8.375,58
Household net Income (MZN)	**8376**	**0**	**0**	**0,00**	**8.375,58**

CBA Metal Silo

Total Production (kg) **900**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Silo Capacity	1000
Acquisition Price (MZN)	5300
Volume Filled	90,00%

Accessory Costs		
Inflation Rate 2014-2016	25,20%	
MZN/kg maize		final cost

	2014	2016	
Candle Acquisition	0,04	0,05	50,08
Rubber Acquisition	1,00	1,25	1.252,00
Wooden Platform	0,40	0,50	500,80

Silo Prices

200 kg	2.600 MZN
400 kg	3.200 MZN
800 kg	4.600 MZN
1000 kg	5.300 MZN

Period	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Silo Acquisition	-5.300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Candle Acquisition	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	
Rubber Acquisition	-1.252	0	-1.252	0	-1.252	0	-1.252	0	-1.252	0	-1.252	0	-1.252	0	-1.252	0	-1.252	0	-1.252	0	
Wooden Platform	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	
Total Cost	**-7.103**	**-50**	**-1.803**	**-50**	**-1.803**	**-50**	**-1.803**	**-50**	**-1.803**	**-50**	**-1.803**	**-50**	**-1.803**	**-50**	**-1.803**	**-50**	**-1.803**	**-50**	**-1.803**	**-50**	**-23.830**
Selling Income	8.376	8.376	8.376	8.376	8.376	8.376	8.376	8.376	8.376	8.376	8.376	8.376	8.376	8.376	8.376	8.376	8.376	8.376	8.376	8.376	167.512
Net Benefit	**1.273**	**8.326**	**6.573**	**8.326**	**6.573**	**8.326**	**6.573**	**8.326**	**6.573**	**8.326**	**6.573**	**8.326**	**6.573**	**8.326**	**6.573**	**8.326**	**6.573**	**8.326**	**6.573**	**8.326**	**143.682**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-7.102,88	-59,83	-2.572,83	-85,38	-3.671,61	-121,84	-5.239,65	-173,87	-7.477,34	-248,12	-10.670,68	-354,09	-15.227,79	-505,31	-21.731,11	-721,11	-31.011,80	-1.029,07	-44.255,98	-1.468,56	-153.729
Adj Income	8.375,58	10.005,47	11.952,53	14.278,49	17.057,09	20.376,40	24.341,65	29.078,53	34.737,21	41.497,07	49.572,41	59.219,20	70.743,25	84.509,89	100.955,51	120.601,45	144.070,50	172.106,62	205.598,56	245.608,05	1.464.685
Adj Net Benefit	**1.272,70**	**9.945,64**	**9.379,70**	**14.193,12**	**13.385,48**	**20.254,56**	**19.102,00**	**28.904,66**	**27.259,88**	**41.248,95**	**38.901,73**	**58.865,11**	**55.515,46**	**84.004,58**	**79.224,40**	**119.880,34**	**113.058,70**	**171.077,54**	**161.342,58**	**244.139,48**	**1.310.957**
Actualized Values (discount rate: r=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-7.102,88	-51,46	-1.903,82	-54,34	-2.010,41	-57,39	-2.122,97	-60,60	-2.241,83	-63,99	-2.367,35	-67,58	-2.499,89	-71,36	-2.639,86	-75,35	-2.787,66	-79,57	-2.943,73	-84,03	-29.286
Act Income	8.375,58	8.606,85	8.844,51	9.088,74	9.339,70	9.597,60	9.862,62	10.134,95	10.414,81	10.702,39	10.997,92	11.301,60	11.613,67	11.934,36	12.263,90	12.602,54	12.950,53	13.308,14	13.675,61	14.053,24	219.669
Act Benefit	**1.272,70**	**8.555,39**	**6.940,69**	**9.034,39**	**7.329,29**	**9.540,21**	**7.739,65**	**10.074,35**	**8.172,98**	**10.638,40**	**8.630,57**	**11.234,02**	**9.113,78**	**11.863,00**	**9.624,04**	**12.527,19**	**10.162,88**	**13.228,56**	**10.731,88**	**13.969,21**	**190.383**

NPV 190.383 MZN

BCR 7,50

CBA Metal Silo

Total Production (kg) **900**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,75
Productivity (ton/ha)	1,2
Total Production (kg)	**900**
Storage Losses	2,04%
Tot Losses (kg)	**18,36**

Maize Inventory Analysis (kg)	
Beginning Inventory	900
Amount Lost	18,36
Ending Inventory	**881,64**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	881,64	881,64
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	881,64	881,64
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	17.045,04	17.045,04
Household net Income (MZN)	**0**	**0**	**0**	**17.045,04**	**17.045,04**

CBA Metal Silo

Total Production (kg) **900**

Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Silo Capacity	1000
Acquisition Price (MZN)	5300
Volume Filled	90,00%

Accessory Costs

Inflation Rate 2014-2016	25,20%

MZN/kg maize	final cost

	2014	2016	
Candle Acquisition	0,04	0,05	50,08
Rubber Acquisition	1,00	1,25	1.252,00
Wooden Platform	0,40	0,50	500,80

Silo Prices

200 kg	2.600 MZN
400 kg	3.200 MZN
800 kg	4.600 MZN
1000 kg	5.300 MZN

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Silo Acquisition	-5.300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Candle Acquisition	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50	
Rubber Acquisition	-1.252	0	-1.252	0	-1.252	0	-1.252	0	-1.252	0	-1.252	0	-1.252	0	-1.252	0	-1.252	0	-1.252	0	
Wooden Platform	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	-501	0	
Total Cost	**-7.103**	**-50**	**-1.803**	**-50**	**-1.803**	**-50**	**-1.803**	**-50**	**-1.803**	**-50**	**-1.803**	**-50**	**-1.803**	**-50**	**-1.803**	**-50**	**-1.803**	**-50**	**-1.803**	**-50**	**-23.830**
Selling Income	17.045	17.045	17.045	17.045	17.045	17.045	17.045	17.045	17.045	17.045	17.045	17.045	17.045	17.045	17.045	17.045	17.045	17.045	17.045	17.045	340.901
Net Benefit	**9.942**	**16.995**	**15.242**	**16.995**	**15.242**	**16.995**	**15.242**	**16.995**	**15.242**	**16.995**	**15.242**	**16.995**	**15.242**	**16.995**	**15.242**	**16.995**	**15.242**	**16.995**	**15.242**	**16.995**	**317.071**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-7.102,88	-59,83	-2.572,83	-85,38	-3.671,61	-121,84	-5.239,65	-173,87	-7.477,34	-248,12	-10.670,68	-354,09	-15.227,79	-505,31	-21.731,11	-721,11	-31.011,80	-1.029,07	-44.255,98	-1.468,56	-153.729
Adj Income	17.045,04	20.362,00	24.324,45	29.057,99	34.712,67	41.467,76	49.537,39	59.177,36	70.693,28	84.450,19	100.884,19	120.516,26	143.968,72	171.985,04	205.453,32	245.434,54	293.196,10	350.252,06	418.411,11	499.833,92	2.980.763
Adj Net Benefit	**9.942,16**	**20.302,18**	**21.751,62**	**28.972,61**	**31.041,06**	**41.345,92**	**44.297,74**	**59.003,49**	**63.215,94**	**84.202,06**	**90.213,52**	**120.162,17**	**128.740,93**	**171.479,73**	**183.722,21**	**244.713,43**	**262.184,30**	**349.222,99**	**374.155,13**	**498.365,36**	**2.827.035**
Actualized Values (discount rate: r=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-7.102,88	-51,46	-1.903,82	-54,34	-2.010,41	-57,39	-2.122,97	-60,60	-2.241,83	-63,99	-2.367,35	-67,58	-2.499,89	-71,36	-2.639,86	-75,35	-2.787,66	-79,57	-2.943,73	-84,03	-29.286
Act Income	17.045,04	17.515,70	17.999,36	18.496,38	19.007,12	19.531,96	20.071,29	20.625,52	21.195,05	21.780,31	22.381,72	22.999,75	23.634,84	24.287,46	24.958,11	25.647,28	26.355,47	27.083,22	27.831,07	28.599,57	447.046
Act Benefit	**9.942,16**	**17.464,24**	**16.095,54**	**18.442,03**	**16.996,70**	**19.474,57**	**17.948,32**	**20.564,92**	**18.953,22**	**21.716,31**	**20.014,37**	**22.932,17**	**21.134,94**	**24.216,10**	**22.318,25**	**25.571,92**	**23.567,81**	**27.003,65**	**24.887,34**	**28.515,54**	**417.760**

NPV 417.760 MZN
BCR 15,26

CBA Metal Silo

Total Production (kg) **1200**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	1
Productivity (ton/ha)	1,2
Total Production (kg)	**1200**
Storage Losses	2,04%

Tot Losses (kg)	**24,48**

Maize Inventory Analysis (kg)	
Beginning Inventory	1200
Amount Lost	24,48
Ending Inventory	**1175,52**

Household Income Analysis Input Table					
	May-Jul	**Aug-Oct**	**Nov-Jan**	**Feb-Apr**	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	1175,52	0	0	0	1175,52
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	1175,52	0,00	0,00	0,00	1175,52
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from sales (MZN)	11167	0	0	0,00	11.167,44
Household net income (MZN)	**11167**	**0**	**0**	**0,00**	**11.167,44**

CBA Metal Silo

Total Production (kg) **1200**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Silo Capacity	400 - 800
Acquisition Price (MZN)	7800
Volume Filled	100,00%

Accessory Costs		
Inflation Rate 2014-2016	25,20%	
MZN/kg maize		final cost

	2014	2016	
Candle Acquisition	0,04	0,05	60,10
Rubber Acquisition	1,00	1,25	1.502,40
Wooden Platform	0,40	0,50	600,96

Silo Prices

200 kg	2.600 MZN
400 kg	3.200 MZN
800 kg	4.600 MZN
1000 kg	5.300 MZN

Period	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Silo Acquisition	-7.800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Candle Acquisition	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	
Rubber Acquisition	-1.502	0	-1.502	0	-1.502	0	-1.502	0	-1.502	0	-1.502	0	-1.502	0	-1.502	0	-1.502	0	-1.502	0	
Wooden Platform	-601	0	-601	0	-601	0	-601	0	-601	0	-601	0	-601	0	-601	0	-601	0	-601	0	
Total Cost	**-9.963**	**-60**	**-2.163**	**-60**	**-2.163**	**-60**	**-2.163**	**-60**	**-2.163**	**-60**	**-2.163**	**-60**	**-2.163**	**-60**	**-2.163**	**-60**	**-2.163**	**-60**	**-2.163**	**-60**	**-30.036**
Selling Income	11.167	11.167	11.167	11.167	11.167	11.167	11.167	11.167	11.167	11.167	11.167	11.167	11.167	11.167	11.167	11.167	11.167	11.167	11.167	11.167	223.349
Net Benefit	**1.204**	**11.107**	**9.004**	**11.107**	**9.004**	**11.107**	**9.004**	**11.107**	**9.004**	**11.107**	**9.004**	**11.107**	**9.004**	**11.107**	**9.004**	**11.107**	**9.004**	**11.107**	**9.004**	**11.107**	**193.313**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-9.963,46	-71,79	-3.087,40	-102,45	-4.405,94	-146,20	-6.287,57	-208,64	-8.972,80	-297,75	-12.804,81	-424,91	-18.273,35	-606,37	-26.077,34	-865,33	-37.214,16	-1.234,89	-53.107,18	-1.762,27	-185.915
Adj Income	11.167,44	13.340,62	15.936,71	19.037,99	22.742,79	27.168,53	32.455,53	38.771,37	46.316,28	55.329,43	66.096,54	78.958,93	94.324,34	112.679,85	134.607,35	160.801,94	192.094,00	229.475,49	274.131,42	327.477,39	1.952.914
Adj Net Benefit	**1.203,98**	**13.268,83**	**12.849,31**	**18.935,54**	**18.336,85**	**27.022,33**	**26.167,95**	**38.562,73**	**37.343,48**	**55.031,69**	**53.291,73**	**78.534,02**	**76.050,98**	**112.073,48**	**108.530,01**	**159.936,61**	**154.879,84**	**228.240,60**	**221.024,24**	**325.715,12**	**1.766.999**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-9.963,46	-61,76	-2.284,58	-65,21	-2.412,49	-68,86	-2.547,57	-72,72	-2.690,20	-76,79	-2.840,82	-81,09	-2.999,87	-85,63	-3.167,83	-90,43	-3.345,19	-95,49	-3.532,48	-100,83	-36.583
Act Income	11.167,44	11.475,81	11.792,69	12.118,32	12.452,94	12.796,80	13.150,16	13.513,27	13.886,41	14.269,86	14.663,89	15.068,80	15.484,89	15.912,48	16.351,87	16.803,39	17.267,38	17.744,18	18.234,15	18.737,65	292.892
Act Benefit	**1.203,98**	**11.414,05**	**9.508,10**	**12.053,10**	**10.040,44**	**12.727,94**	**10.602,59**	**13.440,55**	**11.196,21**	**14.193,06**	**11.823,07**	**14.987,71**	**12.485,02**	**15.826,85**	**13.184,04**	**16.712,96**	**13.922,19**	**17.648,69**	**14.701,67**	**18.636,81**	**256.309**

NPV 256.309 MZN

BCR 8,01

CBA Metal Silo

Total Production (kg) **1200**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	1
Productivity (ton/ha)	1,2
Total Production (kg)	**1200**
Storage Losses	2,04%
Tot Losses (kg)	**24,48**

Maize Inventory Analysis (kg)	
Beginning Inventory	1200
Amount Lost	24,48
Ending Inventory	**1175,52**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	1175,52	1175,52
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	1175,52	1175,52
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	22.726,72	22.726,72
Household net Income (MZN)	**0**	**0**	**0**	**22.726,72**	**22.726,72**

CBA Metal Silo

Total Production (kg) **1200**

Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Silo Capacity	400 - 800
Acquisition Price (MZN)	7800
Volume Filled	100,00%

Accessory Costs		
Inflation Rate 2014-2016	25,20%	
MZN/kg maize		final cost
	2014	**2016**
Candle Acquisition	0,04	0,05 60,10
Rubber Acquisition	1,00	1,25 1.502,40
Wooden Platform	0,40	0,50 600,96

Silo Prices

200 kg	2.600 MZN
400 kg	3.200 MZN
800 kg	4.600 MZN
1000 kg	5.300 MZN

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Silo Acquisition	-7.800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Candle Acquisition	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	
Rubber Acquisition	-1.502	0	-1.502	0	-1.502	0	-1.502	0	-1.502	0	-1.502	0	-1.502	0	-1.502	0	-1.502	0	-1.502	0	
Wooden Platform	-601	0	-601	0	-601	0	-601	0	-601	0	-601	0	-601	0	-601	0	-601	0	-601	0	
Total Cost	**-9.963**	**-60**	**-2.163**	**-60**	**-2.163**	**-60**	**-2.163**	**-60**	**-2.163**	**-60**	**-2.163**	**-60**	**-2.163**	**-60**	**-2.163**	**-60**	**-2.163**	**-60**	**-2.163**	**-60**	**-30.036**
Selling Income	22.727	22.727	22.727	22.727	22.727	22.727	22.727	22.727	22.727	22.727	22.727	22.727	22.727	22.727	22.727	22.727	22.727	22.727	22.727	22.727	454.534
Net Benefit	**12.763**	**22.667**	**20.563**	**22.667**	**20.563**	**22.667**	**20.563**	**22.667**	**20.563**	**22.667**	**20.563**	**22.667**	**20.563**	**22.667**	**20.563**	**22.667**	**20.563**	**22.667**	**20.563**	**22.667**	**424.499**
Adjusted Values (annual inflation rate: = 19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-9.963,46	-71,79	-3.087,40	-102,45	-4.405,94	-146,20	-6.287,57	-208,64	-8.972,80	-297,75	-12.804,81	-424,91	-18.273,35	-606,37	-26.077,34	-865,33	-37.214,16	-1.234,89	-53.107,18	-1.762,27	-185.915
Adj Income	22.726,72	27.149,34	32.432,60	38.743,99	46.283,56	55.290,35	66.049,85	78.903,15	94.257,70	112.600,25	134.512,26	160.688,34	191.958,30	229.313,38	273.937,76	327.246,05	390.928,14	467.002,75	557.881,49	666.445,22	3.974.351
Adj Net Benefit	**12.763,26**	**27.077,55**	**29.345,20**	**38.641,54**	**41.877,63**	**55.144,14**	**59.762,27**	**78.694,51**	**85.284,90**	**112.302,50**	**121.707,45**	**160.263,44**	**173.684,95**	**228.707,01**	**247.860,43**	**326.380,72**	**353.713,97**	**465.767,86**	**504.774,30**	**664.682,95**	**3.788.437**
Actualized Values (discount rate: = 16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-9.963,46	-61,76	-2.284,58	-65,21	-2.412,49	-68,86	-2.547,57	-72,72	-2.690,20	-76,79	-2.840,82	-81,09	-2.999,87	-85,63	-3.167,83	-90,43	-3.345,19	-95,49	-3.532,48	-100,83	-36.583
Act Income	22.726,72	23.354,27	23.999,15	24.661,84	25.342,82	26.042,61	26.761,72	27.500,69	28.260,06	29.040,41	29.842,30	30.666,33	31.513,12	32.383,28	33.277,48	34.196,37	35.140,63	36.110,96	37.108,09	38.132,76	596.062
Act Benefit	**12.763,26**	**23.292,52**	**21.714,57**	**24.596,62**	**22.930,33**	**25.973,75**	**24.214,16**	**27.427,97**	**25.569,87**	**28.963,62**	**27.001,48**	**30.585,24**	**28.513,24**	**32.297,65**	**30.109,65**	**34.105,94**	**31.795,44**	**36.015,48**	**33.575,61**	**38.031,92**	**559.478**

NPV 559.478 MZN
BCR 16,29

CBA 5 Superbag

Total Production (kg) **350**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	0,7
Total Production (kg)	**350**
Storage Losses	0,83%
Total Losses (kg)	**2,91**

Maize Inventory Analysis (kg)	
Beginning Inventory	350
Amount Lost	2,91
Ending Inventory	**347,10**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	347,095	0	0	0	347,10
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	347,10	0,00	0,00	0,00	347,10
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	3297	0	0	0,00	3.297,40
Household net Income (MZN)	**3297**	**0**	**0**	**0,00**	**3.297,40**

CBA Superbag

Total Production (kg) **350**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
acquisition price (MZN)	17
bag capacity (kg)	50
n° bags	7
tot cost bags (MZN)	119

Superbag	
Bag Capacity (kg)	50
n° Bags Needed	7
Cost/Bag (MZN)	100
tot cost bags (MZN)	700

Accessory Costs

Inflation Rate 2014-2016	25,20%

	cost/bag		final cost
	2014	**2016**	
Bamboo Strips	20	25,04	175,28
Timber	20	25,04	175,28
Plastic Cover	36	45,07	315,504
Local Labor	10	12,52	87,64

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bag Acquisition	-119		-119		-119		-119		-119		-119		-119		-119		-119		-119		
Bamboo Strips	-175		-175		-175		-175		-175		-175		-175		-175		-175		-175		
Timber	-175		-175		-175		-175		-175		-175		-175		-175		-175		-175		
Plastic Cover	-316		-316		-316		-316		-316		-316		-316		-316		-316		-316		
Local Labour	-88		-88		-88		-88		-88		-88		-88		-88		-88		-88		
Superbag Acquisition	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	
Total Cost	**-1.573**	**-700**	**-1.573**	**-700**	**-1.573**	**-700**	**-1.573**	**-700**	**-1.573**	**-700**	**-1.573**	**-700**	**-1.573**	**-700**	**-1.573**	**-700**	**-1.573**	**-700**	**-1.573**	**-700**	**-22.727**
Selling Income	3.297	3.297	3.297	3.297	3.297	3.297	3.297	3.297	3.297	3.297	3.297	3.297	3.297	3.297	3.297	3.297	3.297	3.297	3.297	3.297	65.948
Net Benefit	**1.725**	**2.597**	**1.725**	**2.597**	**1.725**	**2.597**	**1.725**	**2.597**	**1.725**	**2.597**	**1.725**	**2.597**	**1.725**	**2.597**	**1.725**	**2.597**	**1.725**	**2.597**	**1.725**	**2.597**	**43.221**
Adjusted Values (annual inflation rate: =19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-1.572,70	-836,22	-2.244,36	-1.193,34	-3.202,85	-1.702,98	-4.570,69	-2.430,28	-6.522,70	-3.468,17	-9.308,34	-4.949,32	-13.283,64	-7.063,02	-18.956,67	-10.079,42	-27.052,48	-14.384,03	-38.605,77	-20.527,01	-191.954
Adj Income	3.297,40	3.939,08	4.705,62	5.621,34	6.715,25	8.022,03	9.583,12	11.448,00	13.675,78	16.337,08	19.516,28	23.314,15	27.851,08	33.270,90	39.745,42	47.479,88	56.719,47	67.757,07	80.942,60	96.694,03	576.636
Adj Net Benefit	**1.724,70**	**3.102,86**	**2.461,26**	**4.427,99**	**3.512,39**	**6.319,05**	**5.012,43**	**9.017,72**	**7.153,08**	**12.868,91**	**10.207,94**	**18.364,83**	**14.567,44**	**26.207,88**	**20.788,75**	**37.400,46**	**29.666,98**	**53.373,04**	**42.336,83**	**76.167,02**	**384.682**
Actualized Values (discount rate: =16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-1.572,70	-719,33	-1.660,76	-759,60	-1.753,74	-802,13	-1.851,93	-847,04	-1.955,62	-894,47	-2.065,11	-944,55	-2.180,73	-997,43	-2.302,82	-1.053,27	-2.431,75	-1.112,24	-2.567,90	-1.174,52	-29.648
Act Income	3.297,40	3.388,45	3.482,02	3.578,17	3.676,97	3.778,50	3.882,84	3.990,05	4.100,23	4.213,45	4.329,80	4.449,35	4.572,21	4.698,47	4.828,20	4.961,53	5.098,53	5.239,31	5.383,99	5.532,65	86.482
Act Benefit	**1.724,70**	**2.669,12**	**1.821,26**	**2.818,56**	**1.923,23**	**2.976,37**	**2.030,91**	**3.143,01**	**2.144,62**	**3.318,98**	**2.264,69**	**3.504,81**	**2.391,49**	**3.701,04**	**2.525,38**	**3.908,25**	**2.666,77**	**4.127,07**	**2.816,08**	**4.358,14**	**56.834**

NPV	56.834 MZN
BCR	2,92

CBA Superbag

Total Production (kg) **350**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	0,7
Total Production (kg)	**350**
Storage Losses	0,83%
Tot Losses (kg)	**2,91**

Maize Inventory Analysis (kg)	
Beginning Inventory	350
Amount Lost	2,91
Ending Inventory	**347,10**

Household Income Analysis Input Table					
	May-Jul	**Aug-Oct**	**Nov-Jan**	**Feb-Apr**	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	347,095	347,10
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	347,10	347,10
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	6.710,50	6.710,50
Household net Income (MZN)	**0**	**0**	**0**	**6.710,50**	**6.710,50**

CBA Superbag

Total Production (kg) **350**

Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
acquisition price (MZN)	17
bag capacity (kg)	50
n° bags	7
tot cost bags (MZN)	119

Superbag	
Bag Capacity (kg)	50
n° Bags Needed	7
Cost/Bag (MZN)	100
tot cost bags (MZN)	700

Accessory Costs	
Inflation Rate: 2014-2016	25,20%

	cost/bag		final cost
	2014	2016	
Bamboo Strips	20	25,04	175,28
Timber	20	25,04	175,28
Plastic Cover	36	45,07	315,504
Local Labor	10	12,52	87,64

Period	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Total
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bag Acquisition	-119		-119		-119		-119		-119		-119		-119		-119		-119		-119		
Bamboo Strips	-175		-175		-175		-175		-175		-175		-175		-175		-175		-175		
Timber	-175		-175		-175		-175		-175		-175		-175		-175		-175		-175		
Plastic Cover	-316		-316		-316		-316		-316		-316		-316		-316		-316		-316		
Local Labour	-88		-88		-88		-88		-88		-88		-88		-88		-88		-88		
Superbag Acquisition	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	-700	
Tot Cost	**-1.573**	**-700**	**-1.573**	**-700**	**-1.573**	**-700**	**-1.573**	**-700**	**-1.573**	**-700**	**-1.573**	**-700**	**-1.573**	**-700**	**-1.573**	**-700**	**-1.573**	**-700**	**-1.573**	**-700**	**-22.727**
Selling Income	6.711	6.711	6.711	6.711	6.711	6.711	6.711	6.711	6.711	6.711	6.711	6.711	6.711	6.711	6.711	6.711	6.711	6.711	6.711	6.711	134.210
Net Benefit	**5.138**	**6.011**	**5.138**	**6.011**	**5.138**	**6.011**	**5.138**	**6.011**	**5.138**	**6.011**	**5.138**	**6.011**	**5.138**	**6.011**	**5.138**	**6.011**	**5.138**	**6.011**	**5.138**	**6.011**	**111.483**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-1.572,70	-836,22	-2.244,36	-1.193,34	-3.202,85	-1.702,98	-4.570,69	-2.430,28	-6.522,70	-3.468,17	-9.308,34	-4.949,32	-13.283,64	-7.063,02	-18.956,67	-10.079,42	-27.052,48	-14.384,03	-38.605,77	-20.527,01	-191.954
Adj Income	6.710,50	8.016,37	9.576,35	11.439,91	13.666,12	16.325,54	19.502,49	23.297,68	27.831,41	33.247,40	39.717,34	47.446,34	56.679,40	67.709,21	80.885,42	96.625,72	115.429,09	137.891,59	164.725,29	196.780,83	1.173.504
Adj Net Benefit	**5.137,80**	**7.180,15**	**7.331,99**	**10.246,57**	**10.463,26**	**14.622,56**	**14.931,80**	**20.867,40**	**21.308,71**	**29.779,23**	**30.409,01**	**42.497,02**	**43.395,76**	**60.646,18**	**61.928,75**	**86.546,30**	**88.376,60**	**123.507,55**	**126.119,52**	**176.253,82**	**981.550**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-1.572,70	-719,33	-1.660,76	-759,60	-1.753,74	-802,13	-1.851,93	-847,04	-1.955,62	-894,47	-2.065,11	-944,55	-2.180,73	-997,43	-2.302,82	-1.053,27	-2.431,75	-1.112,24	-2.567,90	-1.174,52	-29.648
Act Income	6.710,50	6.895,80	7.086,21	7.281,88	7.482,96	7.689,58	7.901,92	8.120,11	8.344,33	8.574,74	8.811,52	9.054,83	9.304,86	9.561,79	9.825,82	10.097,14	10.375,95	10.662,46	10.956,88	11.259,43	175.999
Act Benefit	**5.137,80**	**6.176,47**	**5.425,46**	**6.522,28**	**5.729,22**	**6.887,45**	**6.049,99**	**7.273,07**	**6.388,72**	**7.680,28**	**6.746,41**	**8.110,28**	**7.124,13**	**8.564,36**	**7.523,00**	**9.043,87**	**7.944,20**	**9.550,22**	**8.388,98**	**10.084,92**	**146.351**

NPV	146.351 MZN
BCR	5,94

CBA – Superbag

Total Production (kg) **600**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	1,2
Total Production (kg)	**600**
Storage Losses	0,83%
Total Losses (kg)	**4,98**

Maize Inventory Analysis (kg)	
Beginning Inventory	600
Amount Lost	4,98
Ending Inventory	**595,02**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	595,02	0	0	0	595,02
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	595,02	0,00	0,00	0,00	595,02
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	5653	0	0	0,00	5.652,69
Household net Income (MZN)	**5653**	**0**	**0**	**0,00**	**5.652,69**

CBA – Superbag

Total Production (kg) **600**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
acquisition price (MZN)	17
bag capacity (kg)	50
n° bags	12
tot cost bags (MZN)	204

Superbag	
Bag Capacity (kg)	50
n° Bags Needed	12
Cost/Bag (MZN)	100
tot cost bags (MZN)	1200

Accessory Costs	
Inflation Rate 2014-2016	25,20%

	cost/bag		final cost
	2014	2016	
Bamboo Strips	20	25,04	300,48
Timber	20	25,04	300,48
Plastic Cover	36	45,07	540,864
Local Labor	10	12,52	150,24

Period	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Total
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bag Acquisition	-204		-204		-204		-204		-204		-204		-204		-204		-204		-204		
Bamboo Strips	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Timber	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Plastic Cover	-541		-541		-541		-541		-541		-541		-541		-541		-541		-541		
Local Labour	-150		-150		-150		-150		-150		-150		-150		-150		-150		-150		
Superbag Acquisition	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	
Tot Cost	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-38.961**
Selling Income	5.653	5.653	5.653	5.653	5.653	5.653	5.653	5.653	5.653	5.653	5.653	5.653	5.653	5.653	5.653	5.653	5.653	5.653	5.653	5.653	113.054
Net Benefit	**2.957**	**4.453**	**2.957**	**4.453**	**2.957**	**4.453**	**2.957**	**4.453**	**2.957**	**4.453**	**2.957**	**4.453**	**2.957**	**4.453**	**2.957**	**4.453**	**2.957**	**4.453**	**2.957**	**4.453**	**74.093**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-2.696,06	-1.433,52	-3.847,47	-2.045,73	-5.490,61	-2.919,40	-7.835,47	-4.166,19	-11.181,76	-5.945,44	-15.957,15	-8.484,55	-22.771,96	-12.108,04	-32.497,16	-17.279,01	-46.375,69	-24.658,34	-66.181,31	-35.189,16	-329.064
Adj Income	5.652,69	6.752,70	8.066,78	9.636,57	11.511,85	13.752,06	16.428,21	19.625,14	23.444,19	28.006,43	33.456,48	39.967,11	47.744,71	57.035,84	68.135,01	81.394,08	97.233,37	116.154,98	138.758,74	165.761,19	988.518
Adj Net Benefit	**2.956,63**	**5.319,18**	**4.219,31**	**7.590,84**	**6.021,25**	**10.832,66**	**8.592,74**	**15.458,95**	**12.262,43**	**22.060,99**	**17.499,33**	**31.482,56**	**24.972,76**	**44.927,79**	**35.637,85**	**64.115,07**	**50.857,68**	**91.496,64**	**72.577,43**	**130.572,03**	**659.454**
Actualized Values (discount rate: r=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-2.696,06	-1.233,14	-2.847,01	-1.302,18	-3.006,41	-1.375,08	-3.174,74	-1.452,07	-3.352,48	-1.533,37	-3.540,18	-1.619,22	-3.738,39	-1.709,88	-3.947,70	-1.805,61	-4.168,72	-1.906,71	-4.402,12	-2.013,46	-50.825
Act Income	5.652,69	5.808,78	5.969,17	6.134,00	6.303,38	6.477,43	6.656,29	6.840,09	7.028,97	7.223,06	7.422,51	7.627,46	7.838,08	8.054,51	8.276,92	8.505,47	8.740,33	8.981,68	9.229,69	9.484,55	148.255
Act Benefit	**2.956,63**	**4.575,64**	**3.122,16**	**4.831,82**	**3.296,97**	**5.102,35**	**3.481,56**	**5.388,02**	**3.676,48**	**5.689,69**	**3.882,32**	**6.008,24**	**4.099,69**	**6.344,63**	**4.329,22**	**6.699,86**	**4.571,61**	**7.074,97**	**4.827,57**	**7.471,09**	**97.431**

NPV 97.431 MZN

BCR 2,92

CBA Superbag

Total Production (kg) **600**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,5
Productivity (ton/ha)	1,2
Total Production (kg)	**600**
Storage Losses	0,83%
Total Losses (kg)	**4,98**

Maize Inventory Analysis (kg)	
Beginning Inventory	600
Amount Lost	4,98
Ending Inventory	**595,02**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	595,02	595,02
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	595,02	595,02
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	11.503,72	11.503,72
Household net Income (MZN)	**0**	**0**	**0**	**11.503,72**	**11.503,72**

CBA Superbag

Total Production (kg) **600**

Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
acquisition price (MZN)	17
bag capacity (kg)	50
n° bags	12
tot cost bags (MZN)	204

Superbag	
Bag Capacity (kg)	50
n° Bags Needed	12
Cost/Bag (MZN)	100
tot cost bags (MZN)	1200

Accessory Costs	
Inflation Rate 2014-2016	25,20%

cost/bag			final cost
	2014	2016	
Bamboo Strips	20	25,04	300,48
Timber	20	25,04	300,48
Plastic Cover	36	45,07	540,864
Local Labor	10	12,52	150,24

Period	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Total
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bag Acquisition	-204		-204		-204		-204		-204		-204		-204		-204		-204		-204		
Bamboo Strips	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Timber	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Plastic Cover	-541		-541		-541		-541		-541		-541		-541		-541		-541		-541		
Local Labour	-150		-150		-150		-150		-150		-150		-150		-150		-150		-150		
Superbag Acquisition	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	-1.200	
Total Cost	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-2.696**	**-1.200**	**-38.961**
Selling Income	11.504	11.504	11.504	11.504	11.504	11.504	11.504	11.504	11.504	11.504	11.504	11.504	11.504	11.504	11.504	11.504	11.504	11.504	11.504	11.504	230.074
Net Benefit	**8.808**	**10.304**	**8.808**	**10.304**	**8.808**	**10.304**	**8.808**	**10.304**	**8.808**	**10.304**	**8.808**	**10.304**	**8.808**	**10.304**	**8.808**	**10.304**	**8.808**	**10.304**	**8.808**	**10.304**	**191.114**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-2.696,06	-1.433,52	-3.847,47	-2.045,73	-5.490,61	-2.919,40	-7.835,47	-4.166,19	-11.181,76	-5.945,44	-15.957,15	-8.484,55	-22.771,96	-12.108,04	-32.497,16	-17.279,01	-46.375,69	-24.658,34	-66.181,31	-35.189,16	-329.064
Adj Income	11.503,72	13.742,34	16.416,60	19.611,28	23.427,63	27.986,65	33.432,85	39.938,88	47.710,99	56.995,54	68.086,88	81.336,58	97.164,68	116.072,93	138.660,72	165.644,10	197.878,44	236.385,58	282.386,21	337.338,57	2.011.721
Adj Net Benefit	**8.807,66**	**12.308,82**	**12.569,13**	**17.565,54**	**17.937,02**	**25.067,24**	**25.597,37**	**35.772,69**	**36.529,22**	**51.050,11**	**52.129,73**	**72.852,03**	**74.392,73**	**103.964,89**	**106.163,56**	**148.365,08**	**151.502,75**	**211.727,23**	**216.204,90**	**302.149,41**	**1.682.657**
Actualized Values (discount rate: r=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-2.696,06	-1.233,14	-2.847,01	-1.302,18	-3.006,41	-1.375,08	-3.174,74	-1.452,07	-3.352,48	-1.533,37	-3.540,18	-1.619,22	-3.738,39	-1.709,88	-3.947,70	-1.805,61	-4.168,72	-1.906,71	-4.402,12	-2.013,46	-50.825
Act Income	11.503,72	11.821,37	12.147,79	12.483,23	12.827,93	13.182,14	13.546,14	13.920,19	14.304,57	14.699,56	15.105,45	15.522,56	15.951,18	16.391,64	16.844,26	17.309,38	17.787,34	18.278,50	18.783,23	19.301,89	301.712
Act Benefit	**8.807,66**	**10.588,24**	**9.300,78**	**11.181,05**	**9.821,52**	**11.807,06**	**10.371,41**	**12.468,12**	**10.952,08**	**13.166,19**	**11.565,27**	**13.903,34**	**12.212,79**	**14.681,76**	**12.896,56**	**15.503,77**	**13.618,62**	**16.371,80**	**14.381,10**	**17.288,43**	**250.888**

NPV	250.888 MZN
BCR	5,94

CBA 5 Superbag

Total Production (kg) **900**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,75
Productivity (ton/ha)	1,2
Total Production (kg)	**900**
Storage Losses	0,83%
Total Losses (kg)	**7,47**

Maize Inventory Analysis (kg)	
Beginning Inventory	900
Amount Lost	7,47
Ending Inventory	**892,53**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	892,53	0	0	0	892,53
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	892,53	0,00	0,00	0,00	892,53
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	8479	0	0	0,00	8.479,04
Household net Income (MZN)	**8479**	**0**	**0**	**0,00**	**8.479,04**

CBA Superbag

Total Production (kg) **900**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
acquisition price (MZN)	17
bag capacity (kg)	50
n° bags	18
tot cost bags (MZN)	306

Superbag	
Bag Capacity (kg)	50
n° Bags Needed	18
Cost/Bag (MZN)	100
tot cost bags (MZN)	1800

Accessory Costs

Inflation Rate 2014-2016	25,20%

	cost/bag		final cost
	2014	2016	
Bamboo Strips	20	25,04	450,72
Timber	20	25,04	450,72
Plastic Cover	36	45,07	811,296
Local Labor	10	12,52	225,36

Period	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Total
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bag Acquisition	-306		-306		-306		-306		-306		-306		-306		-306		-306		-306		
Bamboo Strips	-451		-451		-451		-451		-451		-451		-451		-451		-451		-451		
Timber	-451		-451		-451		-451		-451		-451		-451		-451		-451		-451		
Plastic Cover	-811		-811		-811		-811		-811		-811		-811		-811		-811		-811		
Local Labour	-225		-225		-225		-225		-225		-225		-225		-225		-225		-225		
Superbag Acquisition	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	
Tot Cost	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-58.441**
Selling Income	8.479	8.479	8.479	8.479	8.479	8.479	8.479	8.479	8.479	8.479	8.479	8.479	8.479	8.479	8.479	8.479	8.479	8.479	8.479	8.479	169.581
Net Benefit	**4.435**	**6.679**	**4.435**	**6.679**	**4.435**	**6.679**	**4.435**	**6.679**	**4.435**	**6.679**	**4.435**	**6.679**	**4.435**	**6.679**	**4.435**	**6.679**	**4.435**	**6.679**	**4.435**	**6.679**	**111.140**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-4.044,10	-2.150,28	-5.771,20	-3.068,60	-8.235,91	-4.379,10	-11.753,21	-6.249,28	-16.772,64	-8.918,16	-23.935,72	-12.726,83	-34.157,93	-18.162,06	-48.745,73	-25.918,52	-69.563,53	-36.987,52	-99.271,97	-52.783,75	-493.596
Adj Income	8.479,04	10.129,06	12.100,17	14.454,86	17.267,78	20.628,09	24.642,31	29.437,71	35.166,29	42.009,65	50.184,72	59.950,67	71.617,07	85.553,75	102.202,51	122.091,12	145.850,05	174.232,47	208.138,11	248.641,79	1.482.777
Adj Net Benefit	**4.434,94**	**7.978,78**	**6.328,96**	**11.386,26**	**9.031,87**	**16.248,99**	**12.889,10**	**23.188,43**	**18.393,64**	**33.091,49**	**26.249,00**	**47.223,84**	**37.459,14**	**67.391,69**	**53.456,78**	**96.172,60**	**76.286,52**	**137.244,96**	**108.866,14**	**195.858,05**	**989.181**
Actualized Values (discount rate: i=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-4.044,10	-1.849,70	-4.270,52	-1.953,26	-4.509,62	-2.062,62	-4.762,10	-2.178,11	-5.028,72	-2.300,06	-5.310,27	-2.428,83	-5.607,59	-2.564,82	-5.921,55	-2.708,42	-6.253,08	-2.860,06	-6.603,18	-3.020,19	-76.237
Act Income	8.479,04	8.713,17	8.953,76	9.201,00	9.455,07	9.716,15	9.984,44	10.260,14	10.543,45	10.834,59	11.133,76	11.441,20	11.757,12	12.081,77	12.415,38	12.758,21	13.110,50	13.472,52	13.844,53	14.226,82	222.383
Act Benefit	**4.434,94**	**6.863,46**	**4.683,24**	**7.247,74**	**4.945,45**	**7.653,52**	**5.222,34**	**8.082,03**	**5.514,73**	**8.534,53**	**5.823,49**	**9.012,36**	**6.149,53**	**9.516,95**	**6.493,84**	**10.049,79**	**6.857,41**	**10.612,46**	**7.241,35**	**11.206,63**	**146.146**

NPV 146.146 MZN

BCR 2,92

CBA 5 Superbag

Total Production (kg) **900**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	0,75
Productivity (ton/ha)	1,2
Total Production (kg)	**900**
Storage Losses	0,83%
Total Losses (kg)	**7,47**

Maize Inventory Analysis (kg)	
Beginning Inventory	900
Amount Lost	7,47
Ending Inventory	**892,53**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	892,53	892,53
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	892,53	892,53
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	17.255,58	17.255,58
Household net Income (MZN)	**0**	**0**	**0**	**17.255,58**	**17.255,58**

CBA Superbag

Total Production (kg) **900**

Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
acquisition price (MZN)	17
bag capacity (kg)	50
n° bags	18
tot cost bags (MZN)	306

Superbag	
Bag Capacity	50
n° Bags Need	18
Cost/Bag (MZ	100
tot cost bags	1800

Accessory Costs		
Inflation Rate 2014-2016	25,20%	
cost/bag		final cost
	2014	**2016**
Bamboo Strip	20	25,04 450,72
Timber	20	25,04 450,72
Plastic Cover	36	45,07 811,296
Local Labor	10	12,52 225,36

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bag Acquisition	-306		-306		-306		-306		-306		-306		-306		-306		-306		-306		
Bamboo Strips	-451		-451		-451		-451		-451		-451		-451		-451		-451		-451		
Timber	-451		-451		-451		-451		-451		-451		-451		-451		-451		-451		
Plastic Cover	-811		-811		-811		-811		-811		-811		-811		-811		-811		-811		
Local Labour	-225		-225		-225		-225		-225		-225		-225		-225		-225		-225		
Superbag Acquisition	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	-1.800	
Total Cost	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-4.044**	**-1.800**	**-58.441**
Selling Income	17.256	17.256	17.256	17.256	17.256	17.256	17.256	17.256	17.256	17.256	17.256	17.256	17.256	17.256	17.256	17.256	17.256	17.256	17.256	17.256	345.112
Net Benefit	**13.211**	**15.456**	**13.211**	**15.456**	**13.211**	**15.456**	**13.211**	**15.456**	**13.211**	**15.456**	**13.211**	**15.456**	**13.211**	**15.456**	**13.211**	**15.456**	**13.211**	**15.456**	**13.211**	**15.456**	**286.671**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-4.044,10	-2.150,28	-5.771,20	-3.068,60	-8.235,91	-4.379,10	-11.753,21	-6.249,28	-16.772,64	-8.918,16	-23.935,72	-12.726,83	-34.157,93	-18.162,06	-48.745,73	-25.918,52	-69.563,53	-36.987,52	-99.271,97	-52.783,75	-493.596
Adj Income	17.255,58	20.613,52	24.624,91	29.416,91	35.141,44	41.979,97	50.149,27	59.908,32	71.566,48	85.493,31	102.130,31	122.004,87	145.747,02	174.109,39	207.991,08	248.466,14	296.817,65	354.578,37	423.579,32	506.007,86	3.017.582
Adj Net Benefit	**13.211,48**	**18.463,24**	**18.853,70**	**26.348,31**	**26.905,54**	**37.600,87**	**38.396,06**	**53.659,04**	**54.793,83**	**76.575,16**	**78.194,59**	**109.278,05**	**111.589,09**	**155.947,33**	**159.245,35**	**222.547,62**	**227.254,12**	**317.590,85**	**324.307,35**	**453.224,11**	**2.523.986**
Actualized Values (discount rate: r=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-4.044,10	-1.849,70	-4.270,52	-1.953,26	-4.509,62	-2.062,62	-4.762,10	-2.178,11	-5.028,72	-2.300,06	-5.310,27	-2.428,83	-5.607,59	-2.564,82	-5.921,55	-2.708,42	-6.253,08	-2.860,06	-6.603,18	-3.020,19	-76.237
Act Income	17.255,58	17.732,06	18.221,69	18.724,84	19.241,89	19.773,22	20.319,21	20.880,28	21.456,85	22.049,34	22.658,18	23.283,84	23.926,77	24.587,46	25.266,39	25.964,07	26.681,01	27.417,76	28.174,84	28.952,83	452.568
Act Benefit	**13.211,48**	**15.882,35**	**13.951,17**	**16.771,58**	**14.732,27**	**17.710,59**	**15.557,11**	**18.702,18**	**16.428,12**	**19.749,28**	**17.347,91**	**20.855,01**	**18.319,19**	**22.022,64**	**19.344,85**	**23.255,65**	**20.427,93**	**24.557,70**	**21.571,66**	**25.932,64**	**376.331**

NPV	376.331 MZN
BCR	5,94

CBA Superbag

Total Production (kg) **1200**

Worst Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	1
Productivity (ton/ha)	1,2
Total Production (kg)	**1200**
Storage Losses	0,83%
Total Losses (kg)	**9,96**

Maize Inventory Analysis (kg)	
Beginning Inventory	1200
Amount Lost	9,96
Ending Inventory	**1190,04**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	100%	0%	0%	0%	100%
Amount Sold (kg)	1190,04	0	0	0	1190,04
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	1190,04	0,00	0,00	0,00	1190,04
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	11305	0	0	0,00	11.305,38
Household net Income (MZN)	**11305**	**0**	**0**	**0,00**	**11.305,38**

CBA Superbag

Total Production (kg) **1200**

Worst Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
acquisition price (MZN)	17
bag capacity (kg)	50
n° bags	24
tot cost bags (MZN)	408

Superbag	
Bag Capacity (kg)	50
n° Bags Needed	24
Cost/Bag (MZN)	100
tot cost bags (MZN)	2400

Accessory Costs	
Inflation Rate 2014-2016	25,20%

	cost/bag		final cost
	2014	**2016**	
Bamboo Strips	20	25,04	600,96
Timber	20	25,04	600,96
Plastic Cover	36	45,07	1081,728
Local Labor	10	12,52	300,48

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted Values)																					
Bag Acquisition	-408		-408		-408		-408		-408		-408		-408		-408		-408		-408		
Bamboo Strips	-601		-601		-601		-601		-601		-601		-601		-601		-601		-601		
Timber	-601		-601		-601		-601		-601		-601		-601		-601		-601		-601		
Plastic Cover	-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		
Local Labour	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Superbag Acquisition	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	
Total Cost	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-77.921**
Selling Income	11.305	11.305	11.305	11.305	11.305	11.305	11.305	11.305	11.305	11.305	11.305	11.305	11.305	11.305	11.305	11.305	11.305	11.305	11.305	11.305	226.108
Net Benefit	**5.913**	**8.905**	**5.913**	**8.905**	**5.913**	**8.905**	**5.913**	**8.905**	**5.913**	**8.905**	**5.913**	**8.905**	**5.913**	**8.905**	**5.913**	**8.905**	**5.913**	**8.905**	**5.913**	**8.905**	**148.186**
Adjusted Values (annual Inflation Rate: = 19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-5.392,13	-2.867,04	-7.694,94	-4.091,46	-10.981,21	-5.838,80	-15.670,95	-8.332,38	-22.363,53	-11.890,88	-31.914,30	-16.969,10	-45.543,91	-24.216,08	-64.994,31	-34.558,02	-92.751,38	-49.316,69	-132.362,63	-70.378,33	-658.128
Adj Income	11.305,38	13.505,41	16.133,56	19.273,15	23.023,70	27.504,12	32.856,42	39.250,28	46.888,38	56.012,86	66.912,96	79.934,23	95.489,43	114.071,67	136.270,02	162.788,16	194.466,74	232.309,97	277.517,49	331.522,39	1.977.036
Adj Net Benefit	**5.913,25**	**10.638,37**	**8.438,62**	**15.181,69**	**12.042,49**	**21.665,32**	**17.185,47**	**30.917,90**	**24.524,86**	**44.121,99**	**34.998,67**	**62.965,13**	**49.945,52**	**89.855,59**	**71.275,71**	**128.230,14**	**101.715,36**	**182.993,28**	**145.154,86**	**261.144,06**	**1.318.908**
Actualized Values (discount Rate: = 16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-5.392,13	-2.466,27	-5.694,02	-2.604,35	-6.012,82	-2.750,17	-6.349,47	-2.904,14	-6.704,97	-3.066,74	-7.080,37	-3.238,44	-7.476,78	-3.419,76	-7.895,40	-3.611,22	-8.337,44	-3.813,41	-8.804,24	-4.026,92	-101.649
Act Income	11.305,38	11.617,55	11.938,35	12.268,00	12.606,76	12.954,87	13.312,59	13.680,19	14.057,94	14.446,12	14.845,02	15.254,93	15.676,16	16.109,03	16.553,84	17.010,94	17.480,66	17.963,36	18.459,38	18.969,09	296.510
Act Benefit	**5.913,25**	**9.151,28**	**6.244,32**	**9.663,65**	**6.593,93**	**10.204,70**	**6.963,12**	**10.776,04**	**7.352,97**	**11.379,37**	**7.764,65**	**12.016,49**	**8.199,38**	**12.689,27**	**8.658,45**	**13.399,72**	**9.143,22**	**14.149,95**	**9.655,13**	**14.942,18**	**194.861**

NPV	194.861 MZN
BCR	2,92

CBA Superbag

Total Production (kg) **1200**

Best Selling Scenario

Maize Inventory Analysis Input Table	
Machamba Area (ha)	1
Productivity (ton/ha)	1,2
Total Production (kg)	**1200**
Storage Losses	0,83%
Total Losses (kg)	**9,96**

Maize Inventory Analysis (kg)	
Beginning Inventory	1200
Amount Lost	9,96
Ending Inventory	**1190,04**

Household Income Analysis Input Table	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	
Amount Sold (%)	0%	0%	0%	100%	100%
Amount Sold (kg)	0	0	0	1190,04	1190,04
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	

Household Income Analysis					
Amount Sold (kg)	0,00	0,00	0,00	1190,04	1190,04
Sales Price (MZN/kg)	9,50	13,00	18,67	19,33	
Revenue from Sales (MZN)	0	0	0	23.007,44	23.007,44
Household net Income (MZN)	**0**	**0**	**0**	**23.007,44**	**23.007,44**

CBA Superbag

Total Production (kg) **1200**

Best Selling Scenario

Discount Rate	16,25%
Inflation Rate	19,46%

Polypropylene Bag	
acquisition price (MZN)	17
bag capacity (kg)	50
n° bags	24
total cost bags (MZN)	408

Superbag	
Bag Capacity (kg)	50
n° Bags Needed	24
Cost/Bag (MZN)	100
total cost bags (MZN)	2400

Accessory Costs		
Inflation Rate 2014-2016	25,20%	
	cost/bag	final cost
	2014	**2016**
Bamboo Strips	20	25,04	600,96
Timber	20	25,04	600,96
Plastic Cover	36	45,07	1081,728
Local Labor	10	12,52	300,48

Period	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total**
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	
Nominal Values (unadjusted values)																					
Bag Acquisition	-408		-408		-408		-408		-408		-408		-408		-408		-408		-408		
Bamboo Strips	-601		-601		-601		-601		-601		-601		-601		-601		-601		-601		
Timber	-601		-601		-601		-601		-601		-601		-601		-601		-601		-601		
Plastic Cover	-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		-1.082		
Local Labour	-300		-300		-300		-300		-300		-300		-300		-300		-300		-300		
Superbag Acquisition	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	-2.400	
Total Cost	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-5.392**	**-2.400**	**-77.921**
Selling Income	23.007	23.007	23.007	23.007	23.007	23.007	23.007	23.007	23.007	23.007	23.007	23.007	23.007	23.007	23.007	23.007	23.007	23.007	23.007	23.007	460.149
Net Benefit	**17.615**	**20.607**	**17.615**	**20.607**	**17.615**	**20.607**	**17.615**	**20.607**	**17.615**	**20.607**	**17.615**	**20.607**	**17.615**	**20.607**	**17.615**	**20.607**	**17.615**	**20.607**	**17.615**	**20.607**	**382.228**
Adjusted Values (annual inflation rate: i=19,46%)																					
(1+i)^t	1,0000	1,1946	1,4271	1,7048	2,0365	2,4328	2,9063	3,4718	4,1474	4,9545	5,9187	7,0705	8,4464	10,0900	12,0536	14,3992	17,2013	20,5486	24,5474	29,3243	
Adj Cost	-5.392,13	-2.867,04	-7.694,94	-4.091,46	-10.981,21	-5.838,80	-15.670,95	-8.332,38	-22.363,53	-11.890,88	-31.914,30	-16.969,10	-45.543,91	-24.216,08	-64.994,31	-34.558,02	-92.751,38	-49.316,69	-132.362,63	-70.378,33	-658.128
Adj Income	23.007,44	27.484,69	32.833,21	39.222,55	46.855,26	55.973,29	66.865,69	79.877,76	95.421,97	113.991,09	136.173,75	162.673,16	194.329,36	232.145,85	277.321,44	331.288,19	395.756,87	472.771,16	564.772,43	674.677,14	4.023.442
Adj Net Benefit	**17.615,31**	**24.617,65**	**25.138,27**	**35.131,09**	**35.874,05**	**50.134,49**	**51.194,75**	**71.545,38**	**73.058,44**	**102.100,21**	**104.259,45**	**145.704,06**	**148.785,45**	**207.929,77**	**212.327,13**	**296.730,17**	**303.005,50**	**423.454,47**	**432.409,80**	**604.298,81**	**3.365.314**
Actualized Values (discount rate: r=16,25%)																					
(1+r)^-t	1,0000	0,8602	0,7400	0,6365	0,5476	0,4710	0,4052	0,3485	0,2998	0,2579	0,2219	0,1908	0,1642	0,1412	0,1215	0,1045	0,0899	0,0773	0,0665	0,0572	
Act Cost	-5.392,13	-2.466,27	-5.694,02	-2.604,35	-6.012,82	-2.750,17	-6.349,47	-2.904,14	-6.704,97	-3.066,74	-7.080,37	-3.238,44	-7.476,78	-3.419,76	-7.895,40	-3.611,22	-8.337,44	-3.813,41	-8.804,24	-4.026,92	-101.649
Act Income	23.007,44	23.642,74	24.295,59	24.966,46	25.655,86	26.364,29	27.092,28	27.840,38	28.609,13	29.399,11	30.210,91	31.045,12	31.902,37	32.783,28	33.688,52	34.618,76	35.574,69	36.557,01	37.566,45	38.603,77	603.424
Act Benefit	**17.615,31**	**21.176,47**	**18.601,56**	**22.362,11**	**19.643,03**	**23.614,12**	**20.742,81**	**24.936,24**	**21.904,17**	**26.332,37**	**23.130,54**	**27.806,68**	**24.425,58**	**29.363,52**	**25.793,13**	**31.007,54**	**27.237,24**	**32.743,60**	**28.762,21**	**34.576,85**	**501.775**

NPV 501.775 MZN
BCR 5,94