LOCAL ENTERPRISE AUTHORITY

TOMATO ENTERPRISE BUDGETS

Prepared as part of
'The study on the Botswana Horticulture Value Chain mapping and Analysis'

(A study Commissioned by Local Enterprise Authority)

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1. INTRODUCTION

This report was prepared as part of the study on the Botswana Horticulture Value Chain Mapping and analysis. The study required the preparation of enterprise budgets for the selected five crops (enterprises) namely; cabbage, tomato, potato, onion and rape. This report contains enterprise budgets for tomato for various Districts. The purpose of the tomato enterprise budgets is to measure the efficiency and relative profitability of tomato production in Districts selected during the enterprise budgeting exercise.

2. APPROACH AND METHODOLOGY

In preparing the enterprise primary data was collected from farmers in various districts, randomly sampled from the list of farmers identified for the study. A standard questionnaire –enterprise budget data collection tool, was designed and administered to the respondents. The questionnaire was designed to collect data on the actual yield, unit selling price of produce, variable costs for the each crop considered in this report.

The variable costs were standardized and organized into distinctive cost centres, namely; planting material, fertilizers, agro chemicals, labour costs, and other pre-harvest costs, harvest and distribution costs, and other variable costs directly attributable to production. The study did not collect data on the overheads (operational expenses) incurred at each farm, but rather focused only on prime costs. I.e. variable production costs incurred for each enterprise. The decision not to include the overheads is that they are usually incurred at the business level and not crop level.

The gross margins and gross margin percentages (%) were computed for each enterprise budget. The sensitivity analysis was also carried out for each enterprise budget. Sensitivity analysis is a financial model which predicts the outcomes given a specific range of variables. In this report, the model assumes the changes in revenue and variable costs given the changes in the yield achieved by the farmer. The model give scenarios for revenue and total variable costs are different levels of output.

Lastly, the study also considered the common constraints to production experienced by farmers who responded to the questionnaire for enterprise budgets. The respondents were also asked to share the constraints to production of tomatoes during enterprise budgeting. The constraints to production of tomatoes are documented in Table 8- Common constraints / challenges in production of tomatoes.

3. ENTERPRISE BUDGET FRAMEWORK

The study adopted a standard format for preparation of enterprise budgets. Extract 1 indicate the format used and followed during preparation of enterprise budgets. Below the extract are the terms, definitions and explanations of items included in the budgets;

Extract 1: Standard format for the enterprise budget

		BWP/HA	Unit basis
1	**REVENUE (R)** *(yields * unit selling price)*	xxx	xxx
2	**LESS TOTAL VARIABLE COSTS (TVC)**		
2.1	Planting material	xxx	xxx
2.2	Fertilizers	xxx	xxx
2.3	Agrochemicals-*Pesticides, fungicides, etc*	xxx	xxx
2.4	Labour costs	xxx	xxx
2.5	Other pre-harvest costs*	xxx	xxx
2.6	Harvest and distribution costs	xxx	xxx
2.7	Other variable costs attributable to production	xxx	xxx
	Total Variable Costs (TVC)	xxx	xxx
3	**GROSS MARGIN**	xxx	xxx
4	**GROSS MARGIN%**	Xxx%	Xxx%

Terms and definitions used in the enterprise budget;

a) Revenue – Revenue represents gross inflows of cash generated from the sale of produce, computed as yield multiplied by the unit selling price.

b) Variable costs – Variable costs are costs directly attributable to production of each selected crop from the planting stage throughout to maturity, harvest and sale to the market. The variable costs are grouped standard cost centres namely; planting material, fertilizers, agro chemicals, labour costs, and other pre-harvest costs, harvest and distribution costs, and other variable costs directly attributable to production.

c) Fixed costs – Fixed costs are all other costs not directly attributable to production. The fixed costs do not vary with the level of production. I.e. they remain constant throughout production and the cropping season.

d) Gross margin – The gross margin is the resulting return from production and sale of produce. It is the difference between the revenue and total variable costs. The gross profit margin is a performance metric which measures the profitability of an enterprise, after taking into account all production costs.

e) Gross margin %- The gross margin percentage (%) is the gross margin expressed as percentage of revenue.

f) Net profit margin – Net profit margin is the resulting profit after deducting total production costs and operating expenses (overheads) from revenue. The net profit margin was not computed since the overheads were not considered during the study. The overheads are non production costs incurred in the ordinary course of running the farming business.

g) Whole farm budget – Is the budget prepared for all farm operations .i.e. considering all enterprises and other revenue streams, together with the farm operational costs.

i) Breakeven price – Is computed as total variable costs divided by the output or (yield). This is the price at which when produce is sold to the market, the revenue generated will fully cover the total variable costs and result in a nil or zero profit.

4. SAMPLING OF RESPONDENTS

The respondents to enterprise budgets were sampled randomly from various districts in the country. Table 1 below; indicate the crop type and the districts in which respondents were selected;

Table 1: Districts selected for enterprise budgeting

Tomato	
Kgatleng District Ngami District Boteti District	North East District Central District Chobe District

5. LIMITATIONS TO ENTERPRISE BUDGETING

a. The enterprise budgets are prepared using the historical data collected from the sampled farmers. The data on yields, revenue and costs shared by the farmers may not be a true reflection of the actual results realized by the farmer.

b. The allocation of costs such as fertilizers, agro-chemicals and labour to a single enterprise may not be accurate since it is spread to multiple enterprises, in instances where a farmer produce other enterprises alongside the selected crop. The failure to allocate and apportion costs accurately has the potential to distort the bottom line gross margins presented in each enterprise budget.

c. Other costs relating to production may have been omitted by the farmers during the study, thereby distorting the gross margins.

d. The farmers were not able to provide data on the crops they had no prior production experience on. It was difficult therefore difficult to source information on all the crops from one farmer. The study had to approach a sizeable number of farmers to collect data. For example; in most Districts, the majority of farmers did not have production data for potatoes.

e. Other respondents were reluctant to share their revenue and costs, citing confidentiality as the main reason for non response.

f. Time factor may have played a role in the study not being able to collect data for tomato production crops in all districts.

6. TOMATO ENTERPRISE BUDGETS

The current budgets for tomato enterprise were constructed from the financial data collected from the farmers in different districts.

6.1 Tomato Enterprise Budget –Kgatleng District

Total costs of production;

Total costs of production for tomatoes include planting material, fertilizers, agro chemicals, direct labour costs, other pre-harvest costs, harvest and distribution costs and other variable costs. Table 2; below indicate the total cost of production for tomatoes amounted to P68, 121.

Table 2: Total production costs for tomatoes –Kgatleng District

	BWP/HA	% of total costs
Planting material	10,200.00	15%
Fertilizers	9,066.00	13%
Agrochemicals	18,840.00	28%
Labour costs	6,000.00	9%
Other pre-harvest costs*	1,400.00	2%
Harvest and distribution costs	20,740.00	30%
Other variable costs	1,875.00	3%
	68,121.00	**100%**

Distribution of production costs for tomato production; Figure 1 indicate that harvest and distribution costs make up the largest percentage of the total production costs at 30%, while planting material, fertilizers, agro chemicals, Labour costs, other pre-harvest costs, and other variable costs constitute 15%,13%,28%,9%,2% and 3% of the total costs respectively;

Figure 1: Distribution of production costs for tomatoes-Kgatleng District

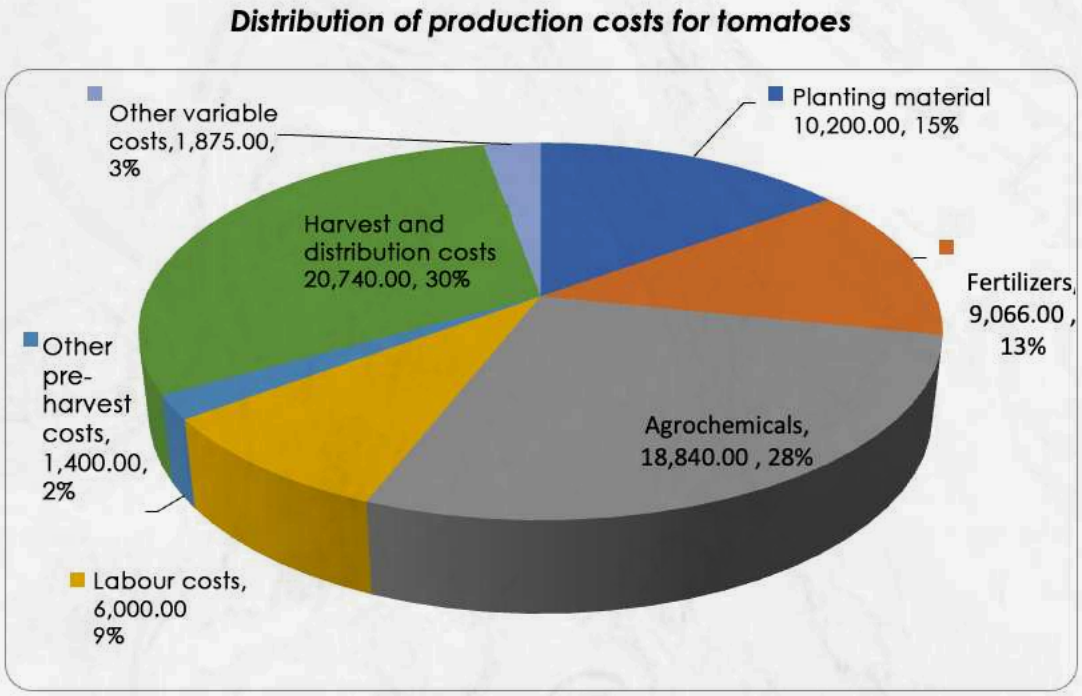


Figure 2: Detailed enterprise budget for tomato in the Kgatleng district;

	Tomato enterprise BUDGET		Kgatleng District (Malotwana)				
Sr.no	Cropping Area-1 HA-Open Field					Per HA	Unit value /
	Cropping in months	3 months					
	Item description	Unit	Output	Output	Unit SP	Value	Yield
		basis	in Tonnes	in Kgs	P/ Kg	in BWP	BWP / unit
1	Revenue from produce	*tonnes*	22.50	22,500.00	12.00	270,000.00	12.00
2	**VARIABLE COSTS (VC)**		**Quantity**	**Unit cost**		**Total cost**	**Cost / unit**
2.1	**PRODUCTION COSTS**						
2.1.1	**Planting material**						
	Seeds-1,000 in a PACKET	*Packets*	10	780.00		7,800.00	0.35
	Coco peat soil -block	*5kg*	6	150.00		900.00	0.04
	Trays	*Trays*	50	30.00		1,500.00	0.07
2.1.2	**Fertilizers**						
i	Multi feed	*5kg*	4	600.00		2,400.00	0.11
ii	Basal-dressing 2:3:2 / 3:2:1	*50Kg*	4	560.00		2,240.00	0.10
iii	Top dressing 5:3:2	*50Kg*	4	780.00		3,120.00	0.14
iv	Urea	*25Kg*	1	526.00		526.00	0.02
v	Potassium Sulphate	*25Kg*	1	780.00		780.00	0.03
2.1.3	**Pesticides Insecticides**						
i	Platoon	*5 litres*	8	1,070.00		8,560.00	0.38
ii	Steward (insecticide)	*1 litre*	2	1,340.00		2,680.00	0.12
iii	Savage (350)	*1 litre*	2	780.00		1,560.00	0.07
iv	Ambligo	*5 litres*	2	3,020.00		6,040.00	0.27
2.1.4	**Permanent farm workers**						
	Direct Labour	*Per month*	3	2,000.00		6,000.00	0.27
2.1.5	**Casual labour**						
2.1.6	**Other Pre Harvest costs**						
	Transport of inputs to the farm	*per trip*	1	400.00		400.00	0.02
	Land preparation	*Tractor hire*	1	1,000.00		1,000.00	0.04
	TOTAL PRE-HARVEST COSTS (VC)					**45,506.00**	**2.02**

3	**POST HAVERST COSTS (VC)**						
3.1	**Harvest and distribution costs**						
	Casual labour @ 3 people	*6md*3*	18	50.00		900.00	0.04
	Packaging material -1 Kg plastic bags	*24000 Units*	500	0.56		13,440	0.60
	Transport to the market	*per trip*	8	800.00		6,400.00	0.28
3.2	**Fixed costs (FC)**						
	Electricity -borehole	*Per month*	3	250.00		750.00	0.03
	Fuel -Booster pump	*Per week*	12	75.00		900.00	0.04
	Airtime	*Per month*	3	75.00		225.00	0.01
	TOTAL POST HAVERST COSTS					**22,615.00**	**1.01**
4	**TOTAL VARIABLE COSTS (VC)**					**66,246.00**	**2.94**
5	**OTHER VARIABLE COSTS**					**1,875.00**	**0.08**
6	***GROSS MARGIN***					***201,879.00***	***8.97***
7	***GROSS MARGIN %***					***75%***	***75%***

Key Assumptions:

a. The yield is approximately 22.5 tonnes / 22,500kgs in a cropping area of one (1) hectare (HA). The yield, has taken into account the normal and abnormal losses / wastage experienced during production.

b. The farmer had planted 10,000 plants as indicated in the budget.

c. The gross revenue is calculated by multiplying the yield with the farm gate price. The farm gate price was established to be P12/kg. This is the price at which produce is sold to the market.

d. The gross margin is calculated by subtracting the variable costs from the revenue. The gross margin % is the gross margin expressed as percentage of revenue.

e. Net profit margin is calculated by subtracting the fixed costs from the gross margin.

f. The yields, revenue, variable costs and fixed costs vary from one farmer to the other in the district.

g. The yields are dependent on other variables such as climatic conditions in each ecological zone, farming practices, and the choice of inputs (fertilizers and agro chemicals) applied.

h. The gross profit margin for tomato enterprise is approximately 75%, as indicated in the enterprise budget.

i. It is important to note that overheads or other operational costs are not included in the budget. These costs should be accounted for when compiling the whole farm budget. Examples of overheads include costs such as; depreciation of assets, interests / finance charges, bank charges, stationery, salaries of non production employees, etc.

Sensitivity analysis: Below is the sensitivity analysis for the actual output of tomatoes for

			Revenue						
			Decrease (-)			Actual	Increase (+)		
			30.0%	20.0%	10.0%	Price	10.0%	20.0%	30.0%
		Output	-8.40	-9.60	-10.80	12.00	13.20	14.40	15.60
			Revenue at different levels of output						
MINUS	30%	15,750.00	-132,300.00	-151,200.00	-170,100.00	189,000.00	207,900.00	226,800.00	245,700.00
	20%	18,000.00	-151,200.00	-172,800.00	-194,400.00	216,000.00	237,600.00	259,200.00	280,800.00
	10%	20,250.00	-170,100.00	-194,400.00	-218,700.00	243,000.00	267,300.00	291,600.00	315,900.00
	Revenue	22,500.00	-189,000.00	-216,000.00	-243,000.00	**270,000.00**	297,000.00	324,000.00	351,000.00
PLUS	10.0%	24,750.00	-207,900.00	-237,600.00	-267,300.00	297,000.00	326,700.00	356,400.00	386,100.00
	20.0%	27,000.00	-226,800.00	-259,200.00	-291,600.00	324,000.00	356,400.00	388,800.00	421,200.00
	30.0%	29,250.00	-245,700.00	-280,800.00	-315,900.00	351,000.00	386,100.00	421,200.00	456,300.00

			Total Variable Costs (TVC)						
			Decrease (-)			Actual	Increase (+)		
			30.0%	20.0%	10.0%	cost	10.0%	20.0%	30.0%
			Total Variable costs at different levels of output						
		Output	-2.12	-2.42	-2.72	3.03	3.33	3.63	3.94
MINUS	30.0%	15,750.00	-33,379.29	-38,147.76	-42,916.23	47,684.70	52,453.17	57,221.64	61,990.11
	20.0%	18,000.00	-38,147.76	-43,597.44	-49,047.12	54,496.80	59,946.48	65,396.16	70,845.84
	10.0%	20,250.00	-42,916.23	-49,047.12	-55,178.01	61,308.90	67,439.79	73,570.68	79,701.57
	Total Cost	22,500.00	-47,684.70	-54,496.80	-61,308.90	**68,121.00**	74,933.10	81,745.20	88,557.30
PLUS	10.0%	24,750.00	-52,453.17	-59,946.48	-67,439.79	74,933.10	82,426.41	89,919.72	97,413.03
	20.0%	27,000.00	-57,221.64	-65,396.16	-73,570.68	81,745.20	89,919.72	98,094.24	106,268.76
	30.0%	29,250.00	-61,990.11	-70,845.84	-79,701.57	88,557.30	97,413.03	106,268.76	115,124.49

6.2 Tomato Enterprise Budget –Ngami District

Total costs of production;

Total costs of production for tomatoes include planting material, fertilizers, agro chemicals, direct labour costs, other pre-harvest costs, harvest and distribution costs and other variable costs. Table 3; below indicate the total cost of production for tomatoes amounted to P92, 000.

Table 3: Total production costs for tomatoes –Ngami District

	BWP/HA	% of total costs
Planting material	13,480.00	15%
Fertilizers	15,832.00	17%
Agrochemicals	20,448.00	22%
Labour costs	11,000.00	12%
Other pre-harvest costs*	1,600.00	2%
Harvest and distribution costs	23,940.00	26%
Other variable costs	5,700.00	6%
	92,000.00	**100%**

Distribution of production costs for tomato production Figure 3 indicate that Harvest and distribution costs make up the largest percentage of the overall costs at 26%, while planting material, fertilizers, agro chemicals, Labour costs, other pre-harvest costs and other variable costs constitute 15%, 17%,22%,12%,2% and 6% of the total production costs respectively;

Figure 3: Distribution of production costs for tomatoes –Ngami District

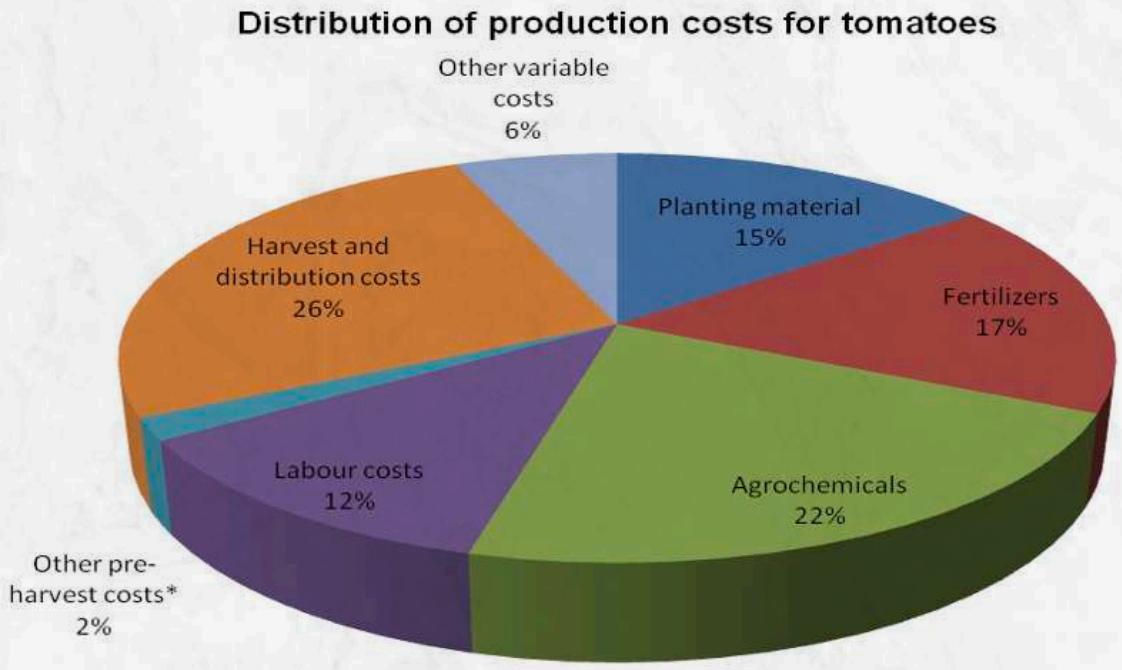


Figure 4: Detailed enterprise budget for tomato in the Ngami district;

	Tomato enterprise BUDGET		Ngami East (Maun)				
Sr.no	Cropping Area-1 HA-Shade net					Per HA	Unit value /
	Cropping in months	3 months					
	Item description	Unit	Output	Output	Unit SP	Value	Yield
		basis	in Tonnes	in Kgs	P/ Kg	in BWP	BWP / unit
1	Revenue from produce	*tonnes*	22.80	22,800.00	12.00	273,600.00	12.00
2	VARIABLE COSTS (VC)		Quantity	Unit cost		Total cost	Cost / unit
2.1	PRODUCTION COSTS						
2.1.1	Planting material						
	Seeds-1,000 in a PACKET	*Packets*	8	1,200.00		9,600.00	0.42
	Germination mix	*25 kg bags*	8	140.00		1,120.00	0.05
	Coco peat soil	*5 Kg block*	8	120.00		960.00	0.04
	Potting tray	*Units/ trays*	40	45.00		1,800.00	0.08
2.1.2	Fertilizers						
i	Multi feed	*1 Kg*	4	230.00		920.00	0.04
ii	Kraal manure	*in 2000 Kgs*	4	1,000.00		4,000.00	0.18
iii	Chicken manure	*in 1,000 kgs*	4	500.00		2,000.00	0.09
iv	Urea	*50 Kg*	4	428.00		1,712.00	0.08
v	Potassium	*25Kg*	4	700.00		2,800.00	0.12
vi	Calcium	*25Kg*	4	400.00		1,600.00	0.07
vii	Folia seed	*1 Litre*	4	700.00		2,800.00	0.12
2.1.3	Pesticides Insecticides						
i	Belt	*1 litre*	4	3,300.00		13,200.00	0.58
ii	Methomax	*500 grams*	4	500.00		2,000.00	0.09
iii	Ema	*1 litre*	4	307.00		1,228.00	0.05
						-	-
2.1.4	Fungicides						
i	Malythane	*1 Kg*	4	235.00		940.00	0.04
ii	Coppercount	*5 Litre*	4	400.00		1,600.00	0.07
iii	Benozine	*1 kg*	4	370.00		1,480.00	0.06
2.1.5	Permanent farm workers						
	Direct Labour	*Per month*	5	2,200.00		11,000.00	0.48
2.1.6	Casual labour						
	Labour planting	*man days*				-	-

	Labour fertilization and chemicals	*man days*				-	-
	Labour weeding	*man days*				-	-
	Labour irrigation set up and management	*man days*				-	-
2.1.7	**Other Pre Harvest costs**						
	Transport of inputs to the farm	*per trip*	4	400.00		1,600.00	0.07
						-	-
	TOTAL PRE-HARVEST COSTS (VC)					**62,360.00**	**2.74**
3	**POST HAVERST COSTS (VC)**						
3.1	**Harvest and distribution costs**						
						-	-
	Packaging material -1 Kg plastic bags	*40,000 units*	40,000	0.22		8,800	0.39
	Cello tape	*Units*	80	15.00		1,200	0.05
	Packaging boxes	*Units*	1,200	8.95		10,740	0.47
	Transport to the market	*per trip*	16	200.00		3,200.00	0.14
3.2	**Other variable costs**						
	Electricity	*Per month*	3	1,200.00		3,600.00	0.16
	Airtime	*Per month*	3	700.00		2,100.00	0.09
	TOTAL POST HAVERST COSTS					**29,640.00**	**1.30**
4	**TOTAL VARIABLE COSTS (VC)**					**86,300.00**	**3.79**
5	**OTHER VARIABLE COSTS**					**5,700.00**	**0.25**
6	***GROSS MARGIN***					***181,600.00***	***7.96***
7	***GROSS MARGIN %***					***66%***	***66%***

Key Assumptions:

a. The yield is approximately 22.8 tonnes / 22,800kgs in a cropping area of one (1) hectare (HA). The yield, has taken into account the normal and abnormal losses / wastage experienced during production.

b. The farmer had planted 8,000 plants as indicated in the budget.

c. The gross revenue is calculated by multiplying the yield with the farm gate price. The farm gate price was established to be P12/kg. This is the price at which produce is sold to the market.

d. The gross margin is calculated by subtracting the variable costs from the revenue. The gross margin % is the gross margin expressed as percentage of revenue.

e. Net profit margin is calculated by subtracting the fixed costs from the gross margin.
f. The yields, revenue, variable costs and fixed costs vary from one farmer to the other in the district.

g. The yields are dependent on other variables such as climatic conditions in each ecological zone, farming practices, and the choice of inputs (fertilizers and agro chemicals) applied.

h. The gross profit margin for tomato enterprise is approximately 66%, as indicated in the enterprise budget.

i. It is important to note that overheads or other operational costs are not included in the budget. These costs should be accounted for when compiling the whole farm budget. Examples of overheads include costs such as; depreciation of assets, interests / finance charges, bank charges, stationery, salaries of non production employees, etc.

Sensitivity analysis: Below is the sensitivity analysis for the actual output of tomatoes for an enterprise budget in figure 4.

			Revenue						
			Decrease (-)			Actual	Increase (+)		
			30.0%	20.0%	10.0%	Price	10.0%	20.0%	30.0%
		Output	-8.40	-9.60	-10.80	12.00	13.20	14.40	15.60
			Revenue at different level of output						
MINUS	***30%***	15,960.00	- 134,064.00	- 153,216.00	- 172,368.00	191,520.00	210,672.00	229,824.00	248,976.00
	20%	18,240.00	- 153,216.00	- 175,104.00	- 196,992.00	218,880.00	240,768.00	262,656.00	284,544.00
	10%	20,520.00	- 172,368.00	- 196,992.00	- 221,616.00	246,240.00	270,864.00	295,488.00	320,112.00
	Revenue	22,800.00	- 191,520.00	- 218,880.00	- 246,240.00	**273,600.00**	300,960.00	328,320.00	355,680.00
PLUS	***10.0%***	25,080.00	- 210,672.00	- 240,768.00	- 270,864.00	300,960.00	331,056.00	361,152.00	391,248.00
	20.0%	27,360.00	- 229,824.00	- 262,656.00	- 295,488.00	328,320.00	361,152.00	393,984.00	426,816.00
	30.0%	29,640.00	- 248,976.00	- 284,544.00	- 320,112.00	355,680.00	391,248.00	426,816.00	462,384.00

			Total Variable Costs (TVC)						
			Decrease (-)			Actual	Increase (+)		
			30.0%	20.0%	10.0%	cost	10.0%	20.0%	30.0%
			Total Variable costs at different level of output						
		Output	-2.82	-3.23	-3.63	4.04	4.44	4.84	5.25
MINUS	***30.0%***	15,960.00	-45,080.00	-51,520.00	-57,960.00	64,400.00	70,840.00	77,280.00	83,720.00
	20.0%	18,240.00	-51,520.00	-58,880.00	-66,240.00	73,600.00	80,960.00	88,320.00	95,680.00
	10.0%	20,520.00	-57,960.00	-66,240.00	-74,520.00	82,800.00	91,080.00	99,360.00	107,640.00
	Total Cost	22,800.00	-64,400.00	-73,600.00	-82,800.00	**92,000.00**	101,200.00	110,400.00	119,600.00
PLUS	***10.0%***	25,080.00	-70,840.00	-80,960.00	-91,080.00	101,200.00	111,320.00	121,440.00	131,560.00
	20.0%	27,360.00	-77,280.00	-88,320.00	-99,360.00	110,400.00	121,440.00	132,480.00	143,520.00
	30.0%	29,640.00	-83,720.00	-95,680.00	- 107,640.00	119,600.00	131,560.00	143,520.00	155,480.00

6.3 Tomato Enterprise Budget –Boteti District

Total costs of production;

Total costs of production for tomatoes include planting material, fertilizers, agro chemicals, direct labour costs, other pre-harvest costs, harvest and distribution costs and other variable costs. Table 5; below indicate the total cost of production for tomatoes amounted to P33, 841.

Table 5: Total production costs for tomatoes –Boteti District

	BWP/HA	% of total costs
Planting material	2,817.00	8%
Fertilizers	5,847.00	17%
Agrochemicals	8,027.00	24%
Labour costs	5,750.00	17%
Other pre-harvest costs*	2,000.00	6%
Harvest and distribution costs	4,300.00	13%
Other variable costs	5,100.00	15%

Distribution of production costs for tomato production Figure 15 indicate that agro chemicals make up the largest percentage of the overall costs at 24%, while planting material, fertilizers, Labour costs, other pre-harvest costs, harvest and distribution costs and other variable costs constitute 8, 17%,17%,6%,13% and 15% of the total production costs respectively;

Figure 5: Distribution of production costs for tomatoes-Boteti District

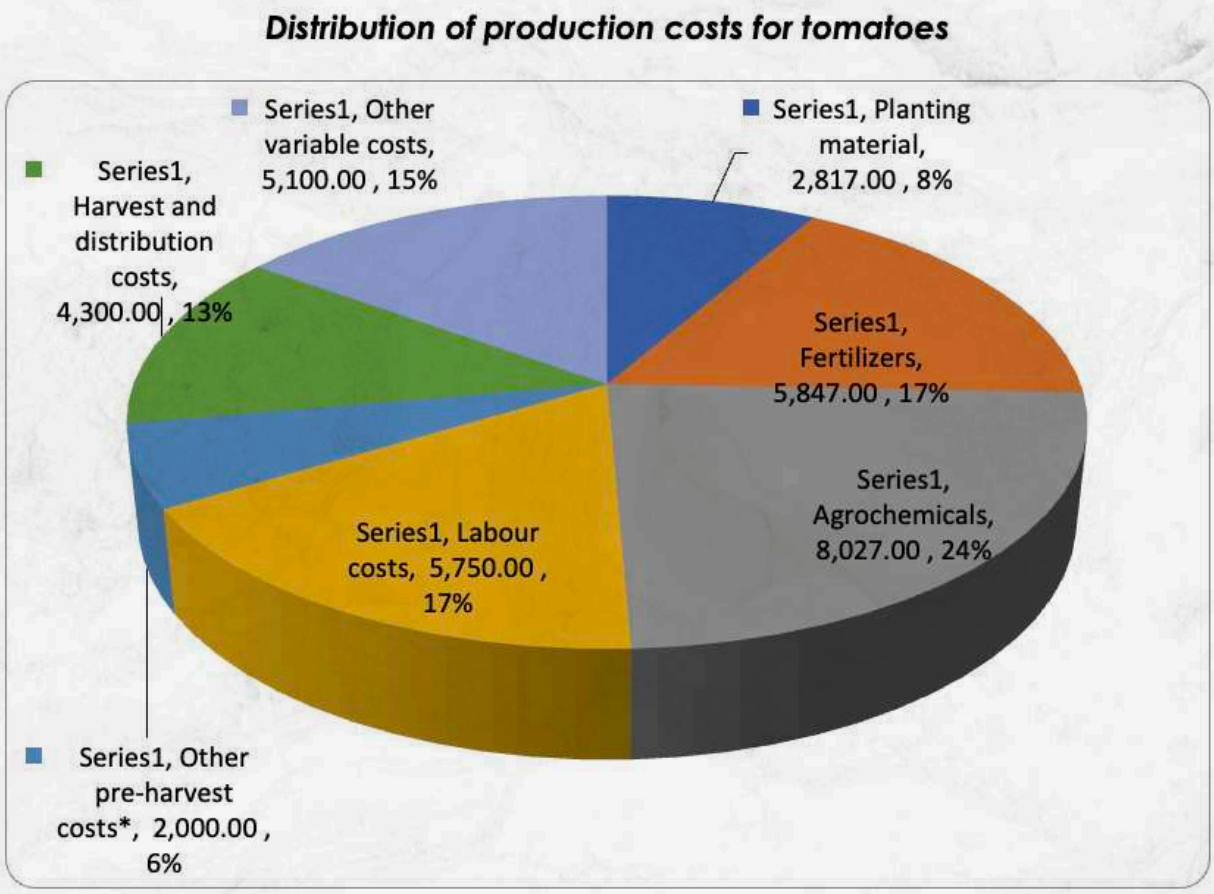


Figure 6: Detailed enterprise budget for tomato in the Boteti district;

	Tomato enterprise BUDGET		Boteti District (Letlhakane)				
Sr.no	Cropping Area-1 HA-shade net					Per HA	Unit value /
	Cropping in months	3 months					
	Item description	Unit	Output	Output	Unit SP	Value	Yield
		basis	in Tonnes	in Kgs	P/ Kg	in BWP	BWP / unit
1	Revenue from produce	*tonnes*	8.25	8,250.00	15.00	123,750.00	15.00
2	VARIABLE COSTS (VC)		Quantity	Unit cost		Total cost	Cost / unit
2.1	PRODUCTION COSTS						
2.1.1	Planting material						
	Seeds	*1 Kg*	1	1,000.00		1,000.00	0.12
	Trays	*Units*	27	35.00		945.00	0.11
	Hygromix	*25 kg*	2	436.00		872.00	0.11
2.1.2	Fertilizers						
i	NPK-2:3:2	*50Kg*	4	600.00		2,400.00	0.29
ii	Easy grow-flower and fruit	*5Kg*	2	306.00		612.00	0.07
iii	Grow fast	*1 litre*	1	588.00		588.00	0.07
iv	Calcium nitrate	*25Kg*	3	299.00		897.00	0.11
v	Potassium Sulphate	*25 Kg*	3	450.00		1,350.00	0.16
2.1.3	Herbicides						
i	Roundup	*20 Litres*	1	1,000.00		1,000.00	0.12
ii	Springbok	*20 Litres*	1	1,220.00		1,220.00	0.15
						-	-
						-	-
2.1.4	Pesticides Insecticides						
i	Ambligo	*1 Litre*	1	2,800.00		2,800.00	0.34
ii	Warlock	*1 litre*	1	450.00		450.00	0.05
iii	Chlopyrifos	*1 litre*	1	832.00		832.00	0.10
iv						-	-
2.1.5	Fungicides						
i	Copstar	*1kg*	2	350.00		700.00	0.08
ii	Cartap	*1kg*	1	510.00		510.00	0.06
iii	Dithane M45	*1kg*	2	125.00		250.00	0.03
iv	Agrimechgold	*1kg*	1	265.00		265.00	0.03

2.1.6	**Permanent farm workers**						
	Direct Labour	*Per month*	3	1,500.00		4,500.00	0.55
2.1.7	**Casual labour**						
	Labour planting	*2 md*5*	10	50.00		500.00	0.06
	Labour fertilization and chemicals	*1 md*5*	5	50.00		250.00	0.03
	Labour weeding	*1 md*5*	5	50.00		250.00	0.03
	Labour irrigation set up and management	*1 md*5*	5	50.00		250.00	0.03
2.1.8	**Other Pre Harvest costs**						
	Transport of inputs to the farm	*per trip*	1	2,000.00		2,000.00	0.24
						-	-
	TOTAL PRE-HARVEST COSTS (VC)					**24,441.00**	**2.96**
3	**POST HAVERST COSTS (VC)**						
3.1	**Harvest and distribution costs**						
	Casual labour @ 3 people	*3md*3*	6	50.00		300.00	0.04
						-	-
	Packaging material -Boxes	*500 boxes*	500	5.00		2,500	0.30
	Transport to the market	*per trip*	2	750.00		1,500.00	0.18
3.2	**Fixed costs (FC)**						
	Diesel -borehole	*Per month*	3	1,500.00		4,500.00	0.55
						-	-
	Airtime	*Per month*	3	200.00		600.00	0.07
	TOTAL POST HAVERST COSTS					**9,400.00**	**1.14**
4	**TOTAL VARIABLE COSTS (VC)**					**28,741.00**	**3.48**
5	**OTHER VARIABLE COSTS**					**5,100.00**	**0.62**
6	***GROSS MARGIN***					***89,909.00***	***10.90***
7	***GROSS MARGIN %***					***73%***	***73%***

Key Assumptions:

a. The yield is approximately 8.25 tonnes / 8,250Kgs in a cropping area of one (1) hectare (HA). The yield, has taken into account the normal and abnormal losses / wastage experienced during production.

b. It is not clear on how many plants were grown.
c. The gross revenue is calculated by multiplying the yield with the farm gate price. The farm gate price was established to be P15/kg. This is the price at which produce is sold to the market.

d. The gross margin is calculated by subtracting the variable costs from the revenue. The gross margin % is the gross margin expressed as percentage of revenue.

e. Net profit margin is calculated by subtracting the fixed costs from the gross margn.
f. The yields, revenue, variable costs and fixed costs vary from one farmer to the other in the district.

g. The yields are dependent on other variables such as climatic conditions in each ecological zone, farming practices, and the choice of inputs (fertilizers and agro chemicals) applied.

h. The gross profit margin for tomato enterprise is approximately 73%, as indicated in the enterprise budget.
i. It is important to note that overheads or other operational costs are not included in the budget. These costs should be accounted for when compiling the whole farm budget. Examples of overheads include costs such as; depreciation of assets, interests / finance charges, bank charges, stationery, salaries of non production employees, etc.

Sensitivity analysis: Below is the sensitivity analysis for the actual output of tomatoes for an enterprise budget in figure 6.

			Revenue						
			Decrease (-)				Increase (+)		
			30.0%	**20.0%**	**10.0%**	**Price**	**10.0%**	**20.0%**	**30.0%**
		Output	-10.50	-12.00	-13.50	15.00	16.50	18.00	19.50
			Revenue at different level of output						
MINUS	***30%***	5,775.00	-60,637.50	-69,300.00	-77,962.50	86,625.00	95,287.50	103,950.00	112,612.50
	20%	6,600.00	-69,300.00	-79,200.00	-89,100.00	99,000.00	108,900.00	118,800.00	128,700.00
	10%	7,425.00	-77,962.50	-89,100.00	-100,237.50	111,375.00	122,512.50	133,650.00	144,787.50
	Revenue	8,250.00	-86,625.00	-99,000.00	-111,375.00	**123,750.00**	136,125.00	148,500.00	160,875.00
PLUS	***10.0%***	9,075.00	-95,287.50	-108,900.00	-122,512.50	136,125.00	149,737.50	163,350.00	176,962.50
	20.0%	9,900.00	-103,950.00	-118,800.00	-133,650.00	148,500.00	163,350.00	178,200.00	193,050.00
	30.0%	10,725.00	-112,612.50	-128,700.00	-144,787.50	160,875.00	176,962.50	193,050.00	209,137.50

			Total Variable Costs (TVC)						
			Decrease (-)			Actual	Increase (+)		
			30.0%	20.0%	10.0%	Cost	10.0%	20.0%	30.0%
			Total Variable costs at different level of output						
		Output	-2.87	-3.28	-3.69	4.10	4.51	4.92	5.33
MINUS	***30.0%***	5,775.00	-16,582.09	-18,950.96	-21,319.83	23,688.70	26,057.57	28,426.44	30,795.31
	20.0%	6,600.00	-18,950.96	-21,658.24	-24,365.52	27,072.80	29,780.08	32,487.36	35,194.64
	10.0%	7,425.00	-21,319.83	-24,365.52	-27,411.21	30,456.90	33,502.59	36,548.28	39,593.97
	Total Cost	8,250.00	-23,688.70	-27,072.80	-30,456.90	**33,841.00**	37,225.10	40,609.20	43,993.30
PLUS	***10.0%***	9,075.00	-26,057.57	-29,780.08	-33,502.59	37,225.10	40,947.61	44,670.12	48,392.63
	20.0%	9,900.00	-28,426.44	-32,487.36	-36,548.28	40,609.20	44,670.12	48,731.04	52,791.96
	30.0%	10,725.00	-30,795.31	-35,194.64	-39,593.97	43,993.30	48,392.63	52,791.96	57,191.29

6.4 Tomato Enterprise Budget –North East District

Total costs of production;

Total costs of production for tomatoes include planting material, fertilizers, agro chemicals, direct labour costs, other pre-harvest costs, harvest and distribution costs and other variable costs. Table 5; below indicate the total cost of production for tomatoes amounted to P78, 461.

Table 5: Total production costs for tomatoes –North East District

	BWP/HA	% of total costs
Planting material	11,600.00	15%
Fertilizers	4,000.00	5%
Agrochemicals	5,690.00	7%
Labour costs	9,201.00	12%
Other pre-harvest costs*	2,250.00	3%
Harvest and distribution costs	31,920.00	41%
Other variable costs	13,800.00	18%
	78,461.00	100%

Distribution of production costs for tomato production Figure 7 indicate that harvest and distribution costs make up the largest percentage of the overall costs at 41%, while planting material, fertilizers, agro chemicals, Labour costs, other pre-harvest costs, harvest and distribution costs and other variable costs constitute 15%, 5%,7%,12%,3% and 17% of the total production costs respectively;

Figure 7: Distribution of production costs for tomatoes-North East District

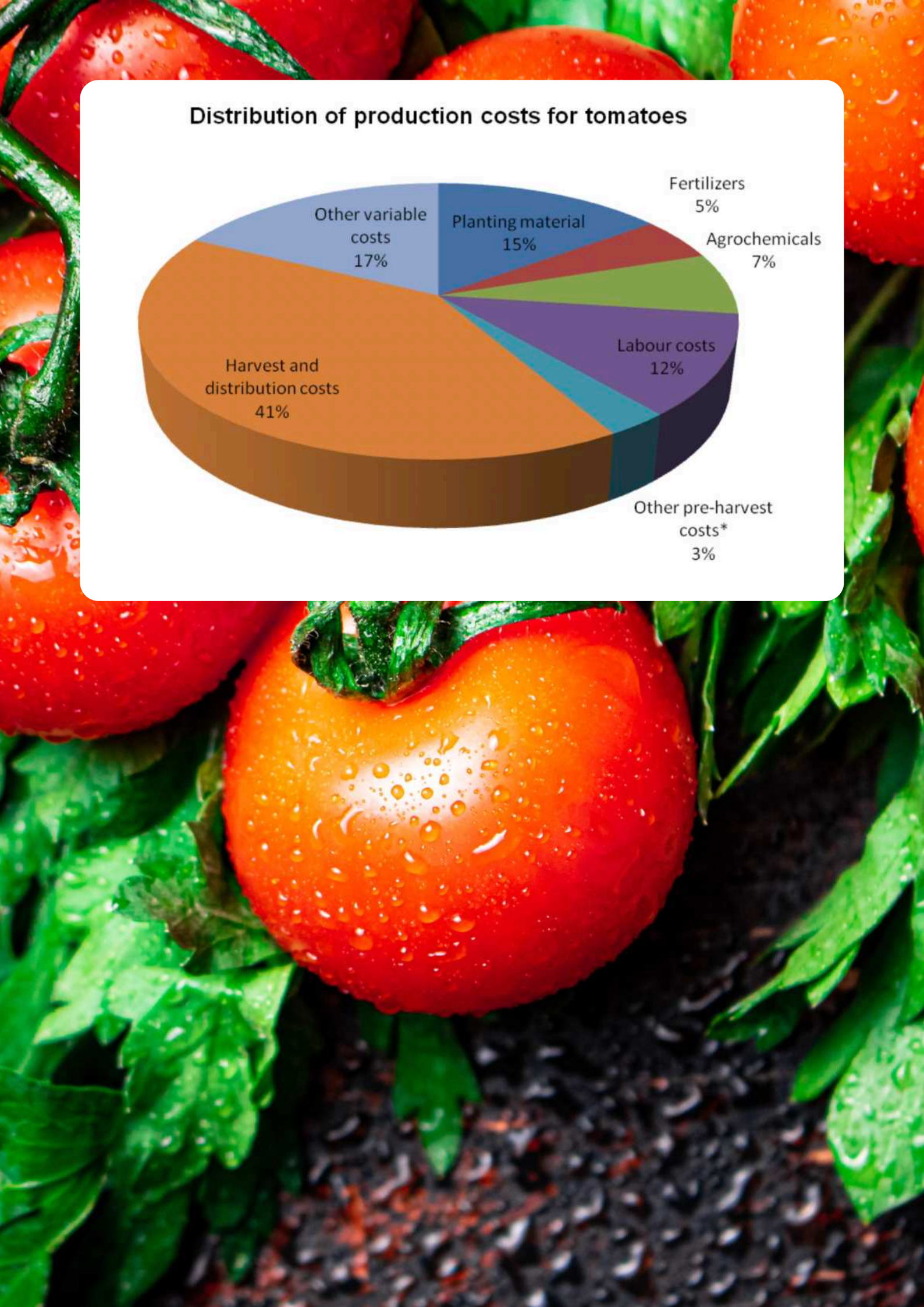

Distribution of production costs for tomatoes
Fertilizers 5%
Other variable costs 17%
Planting material 15%
Agrochemicals 7%
Labour costs 12%
Harvest and distribution costs 41%
Other pre-harvest costs* 3%

Figure 8: Detailed enterprise budget for tomato in the North east district;

	Tomato enterprise BUDGET		North East District (Ditladi)				
Sr.no	Cropping Area-1 HA-Open Field					Per HA	Unit value /
	Cropping in months	3 months					
	Item description	Unit	Output	Output	Unit SP	Value	Yield
		basis	in Tonnes	in Kgs	P/ Kg	in BWP	BWP / unit
1	Revenue from produce	*tonnes*	15.75	15,750.00	10.00	157,500.00	10.00
2	VARIABLE COSTS (VC)		Quantity	Unit cost		Total cost	Cost / unit
2.1	PRODUCTION COSTS						
2.1.1	Planting material						
	Seeds -1,000 per pack	*Packets*	7	1,200.00		8,400.00	0.53
	Growing media	*25Kg*	2	400.00		800.00	0.05
	Staking	*1000 stakes*	1,000	1.00		1,000.00	0.06
	Trellising twines	*5kg*	4	350.00		1,400.00	0.09
2.1.2	Fertilizers						
i	Fertilizer 2:3:2	*50 Kg*	4	300.00		1,200.00	0.08
ii	Super Phosphate	*50 kg*	4	300.00		1,200.00	0.08
iii	Potassium Sulphate	*25 kg*	2	400.00		800.00	0.05
iv	Urea	*50kg*	2	350.00		700.00	0.04
v	Chicken manure	*50kg*	50	2.00		100.00	0.01
2.1.3	Pesticides Insecticides						
i	Ampligo	*1 litre*	1	3,000.00		3,000.00	0.19
ii	Warlock	*1 litre*	1	370.00		370.00	0.02
iii	Scorer	*1 litre*	1	670.00		670.00	0.04
iv						-	-
2.1.4	Fungicides						
i	Bravo	*1 litre*	2	600.00		1,200.00	0.08
ii	Dithane M-15	*1kg*	1	200.00		200.00	0.01
iii	Virikop	*1litre*	1	250.00		250.00	0.02
2.1.5	Permanent farm workers						
	Direct Labour	*Per month*	3	2,667.00		8,001.00	0.51
2.1.6	Casual labour Labour weeding	*8*3md*	24	50.00		1,200.00	0.08
2.1.7	Other Pre Harvest costs						
	Transport of inputs to the farm	*per trip*	1	250.00		250.00	0.02
	Land preparation	*Tractor hire*	1	2,000.00		2,000.00	0.13

	TOTAL PRE-HARVEST COSTS (VC)					**32,741.00**	**2.08**
3	**POST HAVERST COSTS (VC)**						
3.1	**Harvest and distribution costs**						
	Casual labour -harvest	*4*1 md*	4	50.00		200.00	0.01
	Packaging material -1 Kg plastic bags	*plastics*	18,000	0.95		17,100	1.09
	Packaging material -Boxes - 6kgs	*boxes*	1,000	8.00		8,000	0.51
	Tape -for wrapping 1 kg plastics	*units*	10	22.00		220	0.01
	Transport to the market	*per trip*	16	400.00		6,400.00	0.41
3.2	**Other variable costs**						
	Electricity for pumping water	*weekly*	12	1,000.00		12,000.00	0.76
	Airtime	*Per month*	3	600.00		1,800.00	0.11
	TOTAL POST HAVERST COSTS					**45,720.00**	**2.90**
4	**TOTAL VARIABLE COSTS (VC)**					**64,661.00**	**4.11**
5	**OTHER VARIABLE COSTS**					**13,800.00**	**0.88**
6	***GROSS MARGIN***					***79,039.00***	***5.02***
7	***GROSS MARGIN %***					***50%***	***50%***

Key Assumptions:

a. The yield is approximately 15.75 tonnes / 15,750 Kgs in a cropping area of one (1) hectare (HA). The yield, has taken into account the normal and abnormal losses / wastage experienced during production.

b. It is not clear on how many plants were grown.
c. The gross revenue is calculated by multiplying the yield with the farm gate price. The farm gate price was established to be P10/kg. This is the price at which produce is sold to the market.

d. The gross margin is calculated by subtracting the variable costs from the revenue. The gross margin % is the gross margin expressed as percentage of revenue.

e. Net profit margin is calculated by subtracting the fixed costs from the gross margin.
f. The yields, revenue, variable costs and fixed costs vary from one farmer to the other in the district.

g. The yields are dependent on other variables such as climatic conditions in each ecological zone, farming practices, and the choice of inputs (fertilizers and agro chemicals) applied.

h. The gross profit margin for tomato enterprise is approximately 50%, as indicated in the enterprise budget.

i. It is important to note that overheads or other operational costs are not included in the budget. These costs should be accounted for when compiling the whole farm budget. Examples of overheads include costs such as; depreciation of assets, interests / finance charges, bank charges, stationery, salaries of non production employees, etc.

Sensitivity analysis: Below is the sensitivity analysis for the actual output of tomatoes for an enterprise budget in figure 8

			Revenue						
			Decrease (-)			Actual	Increase (+)		
			30.0%	20.0%	10.0%	Price	10.0%	20.0%	30.0%
		Output	-7.00	-8.00	-9.00	10.00	11.00	12.00	13.00
			Revenue at different levels of output						
MINUS	***30%***	11,025.00	-77,175.00	-88,200.00	-99,225.00	110,250.00	121,275.00	132,300.00	143,325.00
	20%	12,600.00	-88,200.00	-100,800.00	-113,400.00	126,000.00	138,600.00	151,200.00	163,800.00
	10%	14,175.00	-99,225.00	-113,400.00	-127,575.00	141,750.00	155,925.00	170,100.00	184,275.00
	Revenue	15,750.00	-110,250.00	-126,000.00	-141,750.00	**157,500.00**	173,250.00	189,000.00	204,750.00
PLUS	***10.0%***	17,325.00	-121,275.00	-138,600.00	-155,925.00	173,250.00	190,575.00	207,900.00	225,225.00
	20.0%	18,900.00	-132,300.00	-151,200.00	-170,100.00	189,000.00	207,900.00	226,800.00	245,700.00
	30.0%	20,475.00	-143,325.00	-163,800.00	-184,275.00	204,750.00	225,225.00	245,700.00	266,175.00

			Total Variable Costs (TVC)						
			Decrease (-)			Actual	Increase (+)		
			30.0%	20.0%	10.0%	Cost	10.0%	20.0%	30.0%
			Total Variable costs at different levels of output						
		Output	-3.49	-3.99	-4.48	4.98	5.48	5.98	6.48
MINUS	***30.0%***	11,025.00	-38,445.89	-43,938.16	-49,430.43	54,922.70	60,414.97	65,907.24	71,399.51
	20.0%	12,600.00	-43,938.16	-50,215.04	-56,491.92	62,768.80	69,045.68	75,322.56	81,599.44
	10.0%	14,175.00	-49,430.43	-56,491.92	-63,553.41	70,614.90	77,676.39	84,737.88	91,799.37
	Total Cost	15,750.00	-54,922.70	-62,768.80	-70,614.90	**78,461.00**	86,307.10	94,153.20	101,999.30
PLUS	***10.0%***	17,325.00	-60,414.97	-69,045.68	-77,676.39	86,307.10	94,937.81	103,568.52	112,199.23
	20.0%	18,900.00	-65,907.24	-75,322.56	-84,737.88	94,153.20	103,568.52	112,983.84	122,399.16
	30.0%	20,475.00	-71,399.51	-81,599.44	-91,799.37	101,999.30	112,199.23	122,399.16	132,599.09

6.5 Tomato Enterprise Budget –Central District

Total costs of production;

Total costs of production for tomatoes include planting material, fertilizers, agro chemicals, direct labour costs, other pre-harvest costs, harvest and distribution costs and other variable costs. Table 6; below indicate the total cost of production for tomatoes amounted to P53, 679.99.

	BWP/HA	% of total costs
Planting material	4,000.00	7%
Fertilizers	13,800.00	26%
Agrochemicals	6,000.00	11%
Labour costs	8,200.00	15%
Other pre-harvest costs*	900.00	2%
Harvest and distribution costs	20,299.99	38%
Other variable costs	480.00	1%
	53,679.99	**100%**

Distribution of production costs for tomato production Figure 9 indicate that harvest and distribution costs make up the largest percentage of the overall costs at 38%, while planting material, fertilizers, agro chemicals, Labour costs, other pre-harvest costs, harvest and distribution costs and other variable costs constitute 7%, 26%,11%,15%,2% and 1% of the total production costs respectively;

Figure 9: Distribution of production costs for tomatoes-Central District

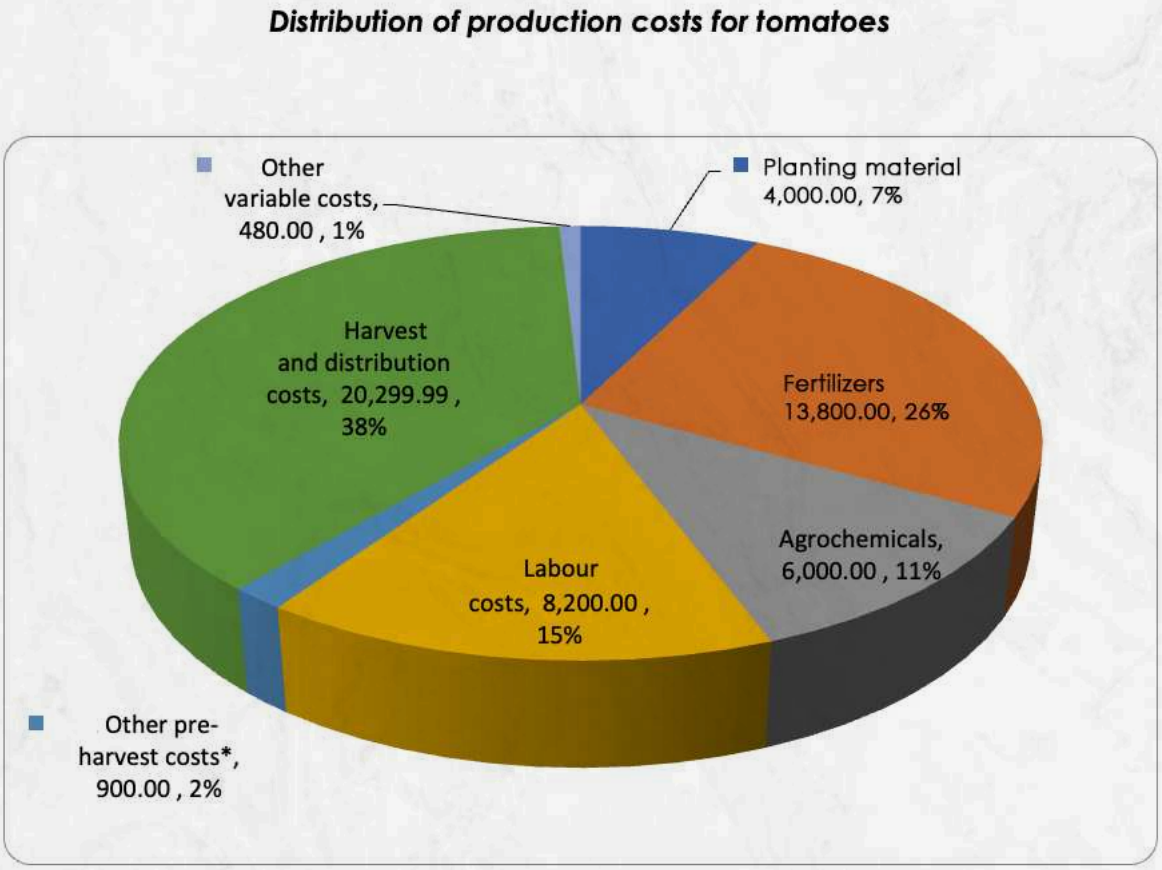


Figure 10: Detailed enterprise budget for tomato in the Central District;

	Tomato enterprise BUDGET		**Central District (Mmadinare)**				
Sr.no	**Cropping Area-1 HA-Shade net**					**Per HA**	**Unit value /**
	Cropping in months	**3 months**					
	Item description	**Unit**	**Output**	**Output**	**Unit SP**	**Value**	**Yield**
		basis	**crates**	**crates**	**Per crate**	**in BWP**	**BWP/ unit**
1	Revenue from produce	*Crates*	1,140.00	1,140.00	200.00	228,000.00	200.00
2	**VARIABLE COSTS (VC)**		**Quantity**	**Unit cost**		**Total cost**	**Cost / unit**
2.1	**PRODUCTION COSTS**						
2.1.1	**Planting material**						
	Seeds -in 2kg	*2kg*	2	2,000.00		4,000.00	3.51
						-	-
2.1.2	**Fertilizers**						
i	Omli-Cal	*10 kg*	4	1,000.00		4,000.00	3.51
ii	Omli-KA	*10 Kg*	6	500.00		3,000.00	2.63
iii	2:3:4 fertilizer	*50Kg*	2	600.00		1,200.00	1.05
iv	Urea	*50 Kg*	4	1,050.00		4,200.00	3.68
v	Multi Seed	*20 Kg*	2	700.00		1,400.00	1.23
2.1.3	**Herbicides**						
i	Hygro-Stic	*20 litres*	2	300.00		600.00	0.53
2.1.4	**Pesticides Insecticides**						
i	Cypermethrine	*3 litres*	2	450.00		900.00	0.79
ii	Copperbelt	*1 litre*	2	1,500.00		3,000.00	2.63
iii	Aquabuss	*2 litres*	2	400.00		800.00	0.70
iv	Coppercount	*1 litres*	4	175.00		700.00	0.61
2.1.5	**Permanent farm workers**						
	Direct Labour	*Per month*	3	1,800.00		5,400.00	4.74
2.1.6	**Casual labour**						
	Labour planting	*4 md*4*	12	100.00		1,200.00	1.05
	Labour fertilization and chemicals	*man days*				-	-
	Labour weeding	*4 md *4*	16	100.00		1,600.00	1.40
	Labour irrigation set up and management	*man days*				-	-
2.1.7	**Other Pre Harvest costs**						
	Transport of inputs to the farm	*Fuel*	3	300.00		900.00	0.79
						-	-

	TOTAL PRE-HARVEST COSTS (VC)					**32,900.00**	**28.86**
3	**POST HAVERST COSTS (VC)**						
3.1	**Harvest and distribution costs**						
	Casual labour @ 2 people	*4md*14*	56	142.86		7,999.99	7.02
	Crates-10 crates @P30 each	*creates*	10	30.00		300	0.26
	Transport to the market	*per month*	6	2,000.00		12,000.00	10.53
3.2	**Other variable costs**						
	Airtime	*Per month*	3	160.00		480.00	0.42
	TOTAL POST HAVERST COSTS					**20,779.99**	**18.23**
4	**TOTAL VARIABLE COSTS (VC)**					**53,199.99**	**46.67**
5	**OTHER VARIABLE COSTS**					**480.00**	**0.42**
6	***GROSS MARGIN***					***174,320.01***	***152.91***
7	***GROSS MARGIN %***					***76%***	***76%***

Key Assumptions:

a. The yield is approximately 1,140 crates in a cropping area of one (1) hectare (HA). The yield, has taken into account the normal and abnormal losses / wastage experienced during production.

b. It is not clear on how many plants were grown.

c. The gross revenue is calculated by multiplying the yield with the farm gate price. The farm gate price was established to be P200 / crate. This is the price at which produce is sold to the market.

d. The gross margin is calculated by subtracting the variable costs from the reveue. The gross margin % is the gross margin expressed as percentage of revenue.

e. Net profit margin is calculated by subtracting the fixed costs from the gross margin. f. The yields, revenue, variable costs and fixed costs vary from one farmer to the other in the district.

g. The yields are dependent on other variables such as climatic conditions in each ecological zone, farming practices, and the choice of inputs (fertilizers and agro chemicals) applied.

h. The gross profit margin for tomato enterprise is approximately 76%, as indicated in the enterprise budget.

i. It is important to note that overheads or other operational costs are not included in the budget. These costs should be accounted for when compiling the whole farm budget. Examples of overheads include costs such as; depreciation of assets, interests / finance charges, bank charges, stationery, salaries of non production employees, etc.

Sensitivity analysis: Below is the sensitivity analysis for the actual output of tomatoes for an enterprise budget in figure 10.

			Revenue						
			Decrease (-)			Actual	Increase (+)		
			30.0%	20.0%	10.0%	Price	10.0%	20.0%	30.0%
		Output	-140.00	-160.00	-180.00	200.00	220.00	240.00	260.00
			Revenue at different levels of output						
MINUS	***30%***	798.00	-111,720.00	-127,680.00	-143,640.00	159,600.00	175,560.00	191,520.00	207,480.00
	20%	912.00	-127,680.00	-145,920.00	-164,160.00	182,400.00	200,640.00	218,880.00	237,120.00
	10%	1,026.00	-143,640.00	-164,160.00	-184,680.00	205,200.00	225,720.00	246,240.00	266,760.00
	Revenue	1,140.00	-159,600.00	-182,400.00	-205,200.00	**228,000.00**	250,800.00	273,600.00	296,400.00
PLUS	***10.0%***	1,254.00	-175,560.00	-200,640.00	-225,720.00	250,800.00	275,880.00	300,960.00	326,040.00
	20.0%	1,368.00	-191,520.00	-218,880.00	-246,240.00	273,600.00	300,960.00	328,320.00	355,680.00
	30.0%	1,482.00	-207,480.00	-237,120.00	-266,760.00	296,400.00	326,040.00	355,680.00	385,320.00

			Total Variable Costs (TVC)						
			Decrease (-)			Actual	Increase (+)		
			30.0%	20.0%	10.0%	cost	10.0%	20.0%	30.0%
			Total Variable costs at different levels of output						
		Output	-32.96	-37.67	-42.38	47.09	51.80	56.51	61.21
MINUS	***30.0%***	798.00	-26,303.20	-30,060.80	-33,818.39	37,575.99	41,333.59	45,091.19	48,848.79
	20.0%	912.00	-30,060.80	-34,355.19	-38,649.59	42,943.99	47,238.39	51,532.79	55,827.19
	10.0%	1,026.00	-33,818.39	-38,649.59	-43,480.79	48,311.99	53,143.19	57,974.39	62,805.59
	Total Cost	1,140.00	-37,575.99	-42,943.99	-48,311.99	**53,679.99**	59,047.99	64,415.99	69,783.99
PLUS	***10.0%***	1,254.00	-41,333.59	-47,238.39	-53,143.19	59,047.99	64,952.79	70,857.59	76,762.39
	20.0%	1,368.00	-45,091.19	-51,532.79	-57,974.39	64,415.99	70,857.59	77,299.19	83,740.79
	30.0%	1,482.00	-48,848.79	-55,827.19	-62,805.59	69,783.99	76,762.39	83,740.79	90,719.19

6.6 Tomato Enterprise Budget –Chobe District

Total costs of production;

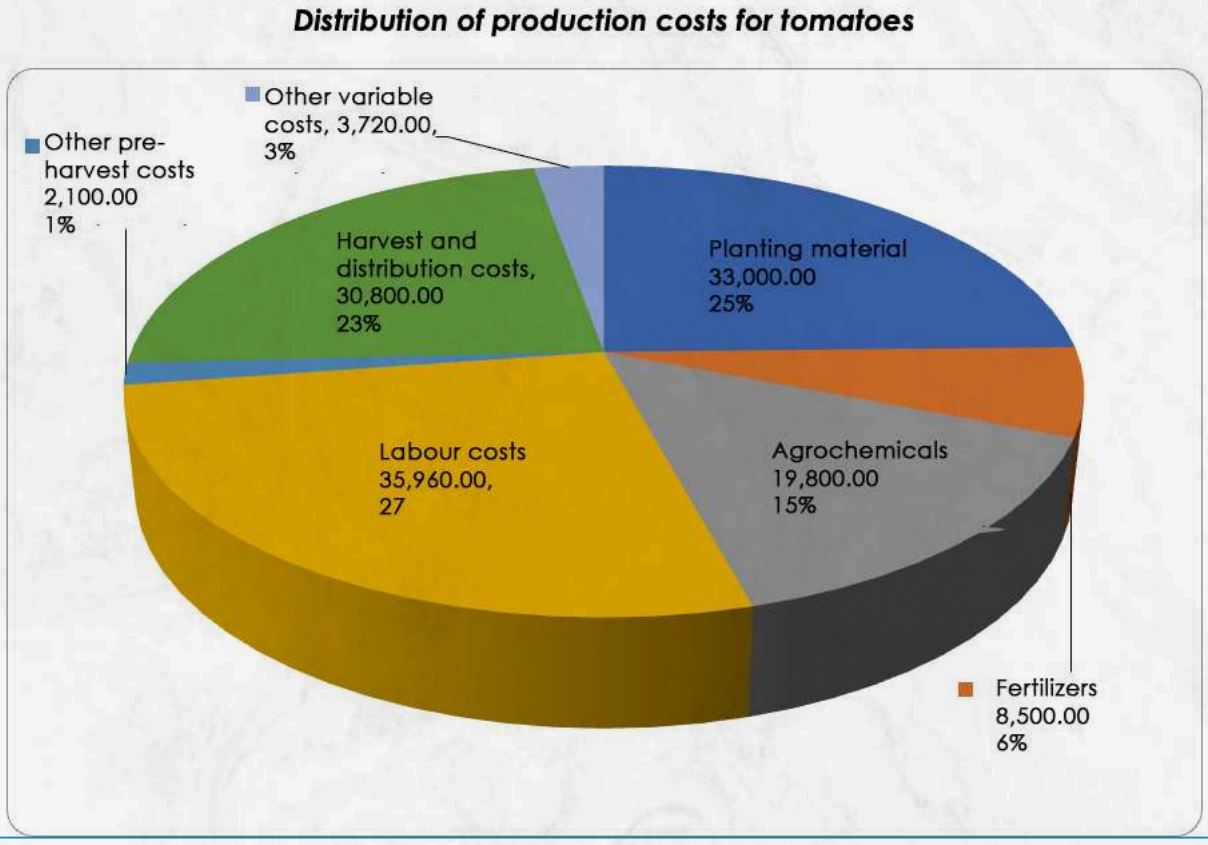
Total costs of production for tomatoes include planting material, fertilizers, agro chemicals, direct labour costs, other pre-harvest costs, harvest and distribution costs and other variable costs. Table 7; below indicate the total cost of production for tomatoes amounted to P133, 880.

Table 7: Total production costs for tomatoes –Chobe District

	BWP/HA	% of total costs
Planting material	33,000.00	25%
Fertilizers	8,500.00	6%
Agrochemicals	19,800.00	15%
Labour costs	35,960.00	27%
Other pre-harvest costs*	2,100.00	2%
Harvest and distribution costs	30,800.00	23%
Other variable costs	3,720.00	3%
	133,880.00	**100%**

Distribution of production costs for tomato production ; Figure 11 indicate that labour costs make up the largest percentage of the overall costs at 27%, while planting material, fertilizers, agro chemicals, other pre-harvest costs, harvest and distribution costs and other variable costs constitute 25%, 6%,15%,1%,23% and 3% of the total production costs respectively;

Figure 11: Distribution of production costs for tomatoes-Chobe District



	Tomato enterprise BUDGET		Chobe-Pandamatenga				
Sr.no	Cropping Area-1 HA-Shade net					Per HA	Unit value /
	Cropping in months	3 months					
	Item description	Unit	Output	Output	Unit SP	Value	Yield
		basis	Tonnes	Kgs	Per / Kg	in BWP	BWP/ unit
1	Revenue from produce	*tonnes*	21.25	21,250.00	13.00	276,250.00	13.00
2	VARIABLE COSTS (VC)		Quantity	Unit cost		Total cost	Cost / unit
2.1	PRODUCTION COSTS						
2.1.1	Planting material						
	Seeds -in 1,000 per packet	*packets*	25	1,000.00		25,000.00	1.18
	Trellising twine	*5kgs*	20	150.00		3,000.00	0.14
	Staking	*Stakes*	5,000	1.00		5,000.00	0.24
2.1.2	Fertilizers						
i	2:3;2 Basal dressing	*50 kg*	3	400.00		1,200.00	0.06
ii	Urea	*50kg*	3	500.00		1,500.00	0.07
iii	Potassium Nitrate	*25 Kg*	2	600.00		1,200.00	0.06
iv	Potassium Sulphate	*25Kg*	2	600.00		1,200.00	0.06
v	Magnesium Sulphate	*25Kg*	2	900.00		1,800.00	0.08
vi	Calcium Nitrate	*25Kg*	2	800.00		1,600.00	0.08
2.1.3	Pesticides Insecticides						
i	Belt	*1 litre*	3	3,000.00		9,000.00	0.42
ii	Ambligo	*1 litre*	3	3,000.00		9,000.00	0.42
iii	Redspidermite	*1 litre*	3	500.00		1,500.00	0.07
iv						-	-
2.1.4	Fungicides						
i	Copper Oxy Chloride	*1 litre*	1	300.00		300.00	0.01
2.1.5	Permanent farm workers						
	Direct Labour @ 5 employees	*Per month*	3	9,000.00		27,000.00	1.27
2.1.6	Casual labour						
	Labour planting	*7 md*10*	70	80.00		5,600.00	0.26
	Labour fertilization and chemicals	*man days*				-	-
	Labour weeding	*7 md*6*	42	80.00		3,360.00	0.16
	Labour irrigation set up and management	*man days*				-	-
2.1.7	Other Pre Harvest costs						
	Transport of inputs to the farm	*Fuel*	3	300.00		900.00	0.04
	Land preparation	*Tractor*	1	1,200.00		1,200.00	0.06

	TOTAL PRE-HARVEST COSTS (VC)					**99,360.00**	**4.68**
3	**POST HAVERST COSTS (VC)**						
3.1	**Harvest and distribution costs**						
	Casual labour @ 2 people	*6md*10*	60	80.00		4,800.00	0.23
	Plastic bags -1kgs	*bags*	25,000	0.80		20,000	0.94
	Tape	*Units*	60	40.00		2,400	0.11
	Transport to the market	*per month*	1.5	4,000.00		6,000.00	0.28
3.2	**Other variable costs**						
	Diesel	*per month*	3	1,000.00		3,000.00	0.14
						-	-
	Airtime	*Per month*	3	240.00		720.00	0.03
	TOTAL POST HAVERST COSTS					**36,920.00**	**1.74**
4	**TOTAL VARIABLE COSTS (VC)**					**132,560.00**	**6.24**
5	**OTHER VARIABLE COSTS**					**3,720.00**	**0.18**
6	***GROSS MARGIN***					***139,970.00***	***6.59***
7	***GROSS MARGIN %***					***51%***	***51%***

Key Assumptions:

a. The yield is approximately 21.25 tonnes / 21,250 Kgs in a cropping area of one (1) hectare (HA). The yield, has taken into account the normal and abnormal losses / wastage experienced during production.

b. It is not clear on how many plants were grown.

c. The gross revenue is calculated by multiplying the yield with the farm gate price. The farm gate price was established to be P13/kg. This is the price at which produce is sold to the market.

d. The gross margin is calculated by subtracting the variable costs from the revenue. The gross margin % is the gross margin expressed as percentage of revenue.

e. Net profit margin is calculated by subtracting the fixed costs from the gross margin.

f. The yields, revenue, variable costs and fixed costs vary from one farmer to the other in the district.

g. The yields are dependent on other variables such as climatic conditions in each ecological zone, farming practices, and the choice of inputs (fertilizers and agro chemicals) applied.

h. The gross profit margin for tomato enterprise is approximately 51%, as indicated in the enterprise budget.

i. It is important to note that overheads or other operational costs are not included in the budget. These costs should be accounted for when compiling the whole farm budget. Examples of overheads include costs such as; depreciation of assets, interests / finance charges, bank charges, stationery, salaries of non production employees, etc.

Sensitivity analysis: Below is the sensitivity analysis for the actual output of tomatoes for an enterprise budget in figure 12.

			Revenue						
			Decrease (-)			Actual	Increase (+)		
			30.0%	20.0%	10.0%	Price	10.0%	20.0%	30.0%
		Output	-9.10	-10.40	-11.70	13.00	14.30	15.60	16.90
			Revenue at different level of output						
MINUS	***30%***	14,875.00	-135,362.50	-154,700.00	-174,037.50	193,375.00	212,712.50	232,050.00	251,387.50
MINUS	***20%***	17,000.00	-154,700.00	-176,800.00	-198,900.00	221,000.00	243,100.00	265,200.00	287,300.00
MINUS	***10%***	19,125.00	-174,037.50	-198,900.00	-223,762.50	248,625.00	273,487.50	298,350.00	323,212.50
	Revenue	21,250.00	-193,375.00	-221,000.00	-248,625.00	**276,250.00**	303,875.00	331,500.00	359,125.00
PLUS	***10.0%***	23,375.00	-212,712.50	-243,100.00	-273,487.50	303,875.00	334,262.50	364,650.00	395,037.50
PLUS	***20.0%***	25,500.00	-232,050.00	-265,200.00	-298,350.00	331,500.00	364,650.00	397,800.00	430,950.00
PLUS	***30.0%***	27,625.00	-251,387.50	-287,300.00	-323,212.50	359,125.00	395,037.50	430,950.00	466,862.50

			Total Variable Costs (TVC)						
			Decrease (-)			Actual	Increase (+)		
			30.0%	20.0%	10.0%	cost	10.0%	20.0%	30.0%
			Total Variable costs at different level of output						
		Output	-4.49	-5.13	-5.77	6.41	7.05	7.70	8.34
MINUS	***30.0%***	14,875.00	-66,777.20	-76,316.80	-85,856.40	95,396.00	104,935.60	114,475.20	124,014.80
MINUS	***20.0%***	17,000.00	-76,316.80	-87,219.20	-98,121.60	109,024.00	119,926.40	130,828.80	141,731.20
MINUS	***10.0%***	19,125.00	-85,856.40	-98,121.60	-110,386.80	122,652.00	134,917.20	147,182.40	159,447.60
	Total Cost	21,250.00	-95,396.00	-109,024.00	-122,652.00	**136,280.00**	149,908.00	163,536.00	177,164.00
PLUS	***10.0%***	23,375.00	-104,935.60	-119,926.40	-134,917.20	149,908.00	164,898.80	179,889.60	194,880.40
PLUS	***20.0%***	25,500.00	-114,475.20	-130,828.80	-147,182.40	163,536.00	179,889.60	196,243.20	212,596.80
PLUS	***30.0%***	27,625.00	-124,014.80	-141,731.20	-159,447.60	177,164.00	194,880.40	212,596.80	230,313.20

7. CONSTRAINTS TO PRODUCTION OF TOMATOES.

Table 8; indicate the constraints to production of tomatoes as shared by farmers interviewed for the enterprise budgets in each District.

Table 8: Constraints / challenges to production of tomatoes in each budget District;

Name of crop	Constraints to production of tomatoes per District	
Tomato	Kgatleng District	▪ Loss of produce due to lack of market- This is because vegetables are highly perishable and if not sold within a short of period of time they deteriorate into waste. This situation is attributed to lack of access the market as experienced by most of the respondents to the enterprise budget
	Ngami District	▪ Unreliable labour ▪ Pests are the main challenge
	Boteti District	▪ Unskilled labour personnel on the use and application of agro chemicals.
	North East District	▪ New infestation of ''*Tuta Absoluta*' has significantly reduced output and has increased costs of agro chemicals. *This pest attacks the crops and feeds of the leaves and the fruit.*
	Central District	▪ Harsh weather conditions ▪ Pests attack.
	Chobe District	▪ **Constraints not shared**

ANNEXURE 1: Enterprise Budget Data collection tool

Name of respondent	
Farm Location	
District	
Name of crop / vegetable	
Months taken from planting to harvest	

A. Collect data on quantities sold for a 1 HA production and the unit selling price for the product;

	Item description (vegetable)	Unit	Output	Output	Unit SP
		basis	*in Tonnes / heads/ bundles*	*in Kgs/ heads/ bundle*	*P/ Kg , head, bundles, etc*
1.					

B. Collect data on cost of seeds, fertilizers, pesticides and labour for 1 HA production

2	VARIABLE COSTS (VC)	*Basis*	Quantity	Unit cost
2.1	**PRODUCTION COSTS**			
2.1.1	**Planting material**			
	Seed / seedlings			
2.1.2	**Fertilizers**			
i				
ii				
iii				
iv				
v				
2.1.3	**Herbicides**			
i				
ii				
iii				
iv				
2.1.4	**Pesticides Insecticides**			
i				
ii				
iii				
iv				
2.1.5	**Fungicides**			
i				

ii				
iii				
iv				
2.1.6	**Permanent farm workers**			
	Direct Labour	*man days*		
2.1.7	**Casual labour**			
	Labour planting	*man days*		
	Labour fertilization and chemicals	*man days*		
	Labour weeding	*man days*		
	Labour irrigation set up and management	*man days*		
3	**Marketing and distribution costs**			
	Transport to market	*Per trip / fuel cost*		
	Airtime used	*Per month*		
	Packaging materials used			
4	**Other variable costs**			
	Diesel for borehole engine (**if any**)			
	Transporting inputs to farm			
	Other costs_____list them			

Notes:

a. Enquire on the rate for casual labour, and the number of days / hours engaged at each stage of production.

C. Constraints to production

Ask the farmer on constraints to production, affecting the production and yields. (Production related challenges only)