

Regina Mundi Convent Design Report

Project	: Regina Mundi Mission Gwayi Convent Garden
Location	: Lupane District Matabeleland North Province
Contact person	: Sr. S. Dube (AMR Sisters Superior)
Date of visit	: 20 th January 2022.
Team	: C. Mpala and T. Mbira
Scope of visit	: Agricultural and irrigation assessment at Regina Mundi Mission Convent Garden



The AMR Sisters have access to about 5 hectares of mission farm. The area has the convent complex, gardening and orchard area.

1.0 Proposed Cropping Pattern

In proposing a cropping pattern for the gardening project several factors have been taken into consideration, namely:

- The Convent's wishes and aspirations
 - The agronomical consideration, soils, climatic conditions and rotational consideration
- Availability of inputs, marketing aspects, financial considerations, nutritional aspects and labour requirements

After discussion with the AMR Superior and taking into consideration the above named factors, the cropping pattern in Figure 1 was proposed. Covo will be grown all year round on 0.2 hectares, whilst cabbage, carrots and onion will be grown in winter and tomato, green maize, butternut and cabbages will be grown in summer.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Green maize												
Butternut												
Onion												
Carrots												
Tomato												
Cabbage												
Covo												

Figure 1: Proposed Cropping Pattern

2.2 Crop Yields

Three different levels of yields were considered for each crop, based on the data provided by AGRITEX. Table 1 presents the yield levels of the crops incorporated in the cropping pattern discussed earlier and varieties with good potentials should be used. In selecting the varieties, the following factors have to be considered: their climatic requirements, resistance to diseases and the quality of produce.

Table 1: Estimated Yield Levels of Proposed Crops

Crop	Unit	Yield Level	Year 1	Year 2	Year 3	Year 4
Green maize	cob	high	24 000	27 000	30 000	30 000
Butternut	tonne	low	16	18	20	20
Onion	tonne	medium	40	45	50	50
Carrots	tonne	low	16	18	20	20
Tomato	tonne	high	40	45	50	50
Cabbage	head	low	20 000	22 500	25 000	25 000

The gardening staff members do not have any experience in irrigated production and hence a moderate yield level should be adopted for all crops. A learning process for the new crops (butternut) is assumed, so yields are estimated at 80% for year 1, 90% for year 2 and 100% from year 3 onwards.

2.3 Gross Margin Analysis

Five to ten per cent of the crops produced will be retained for consumption by the Convent. The majority of the production will be for sale. The area planted, yield, produce to be retained, produce to be sold, selling price and income to be realised are shown in Table 2.

Table 2: Regina Mundi Gross Margin Analysis

Crop	Area (ha)	Yield	Units	Retained	Sales	Unit Price	Income
Green mealies	0.3	9000	cob				
Butternut	0.3	4500	kg				
Onion	0.3	15000	kg				
Carrots	0.1	1500	kg				

Tomato	0.1	10000	kg				
Cabbage	0.1	5000	head				
Covo	0.2	2000	kg				
	1.4						

The irrigated project has a positive gross margin of US\$.....

3.0 Access to Markets and Marketing

Regina Mundi is accessible from Sipepa and Lupane Town through the Sipepa-Lupane Road and the project is 43 kilometres from Lupane Town and is near Sipepa Centre. The project will supply vegetables to the local community and Regina Mundi boarding primary and secondary schools. The Convent will have to enter into agreement with St. Paul's Secondary School (83 km away). This is a boarding school run by the AMR Sisters. The other main vegetable market will be St Luke's Mission Hospital (50 km away). This is 250 bed hospital and is currently buying vegetables from Bulawayo (140 km away).

4.0 Project Activities

Project implementation will be carried out in phases

Phase One (Year 1)

The following activities need to be done at the Convent for the realisation of the project.

- Bush clearing of the garden area
- Fencing of the whole gardening area
- Drip irrigation installation of 0.7 ha
- Ploughing of 0.7 hectares using animal draught power
- Cropping of the 0.7 ha area
- Training of staff in horticultural production, operation and management of drip irrigation, irrigation water management, pest and disease management options and fertility management.

Phase Two (Orchard)

- Extension of the drip irrigation

Phase Three and Four

- Establishment of the orchard

5.0 Operational Expenditure

Table 3 below shows the operational expenditure of the project.

Table 3: Operation Expenditure

Description	Quantity	Unit	Price	Total Cost
Seeds				
Maize	10	kg		
Butternut	1	kg		
Cabbage	0.2	kg		
Land Preparation				
Contract ploughing	0.7	ha		
Gardening equipment				
Knap sack sprayer	2	no		
Shovel	2	no		
Wheelbarrow	1	no		

Pick	2	no		
Hoes	3	no		
Fertiliser and agrochemicals				
Compound D	300	kg		
Ammonium Nitrate	200	kg		
Malathion 50EC	1	kg		
Lambda	1	litre		
Carbaryl 85 % WP	1	kg		
Fenvalarate	1	litre		
Copper oxychloride 85%	1	kg		
Dicchlorvos	1	litre		
Dithane M45	2	kg		
Dimethoate 40 EC	1	l		
Total Operational Costs				

Ploughing will be done using animal draught power (oxen) instead of a tractor and the oxen are available locally from the community.

A detailed bill of quantities and cost for Phase One activities is summarised (Table 4).

Table 4: Detailed bill of quantities and cost estimates for rehabilitating the garden

Item	Description	Quantity	Unit	Price	Total Cost
1	Reservoir Tanks				
1.1	40mm HDPE bend	4	no		
1.2	40mm x HDPE male adapter	2	no		
1.3	5000L plastic tank	1	no		
1.5	40mm x 2" HDPE female compression adapter	2	no		
1.7	40mm equal TEE	1	no		
1.8	40mm x 1 1/2 HDPE male adapter	2	no		
1.9	40mm HDPE coupling	2	no		
1.1	1 1/2" nickel coated ball valve	2	no		
Sub Total					
2	Drip Irrigation Equipment				
2.1	40mm HDPE class 6 pipe	200	m		
2.2	40mm HDPE TEE	4	no		
2.3	40mm HDPE elbow	4	no		
2.4	40mm x 1 1/2 HDPE male adapter	8	no		
2.5	1 1/2" nickel coated ball valve	4	no		
2.6	40mm HDPE end cap	4	no		
2.7	16mm rubber grommets	120	no		

2.8	16mm drip quick start barb connector	120	no		
2.9	16mm drip end cap	120	no		
2.1	16mm dripline 1.6L/ hour @ 0.3 m spacing	4	reel		
Sub Total					
4	Fencing perimeter 500m				
4.1	Field Fence 1800 x 300 x 100	500	m		
4.2	Double Vee Standard Post. 2.4 m long	50	no		
4.3	Stays, 38 mm	16	no		
4.4	Corner Post, 76 mm, 2.4 m long	10	no		
4.5	Double Leaf Gate	1	no		
4.6	Tying Wire	4	kg		
4.7	Bush clearing and stumping	1	lump sum		
Sub total					
5	Installation and commissioning				
5.1	Transportation of material (Bulawayo to R. Mundi)	430	km		
5.2	Labour	3	days		
Sub total					
Total					

5.0 Implementation of the Project

- Upon funding, the implementation of the project estimated to be completed in three (3) months. This involves activities such bush clearing, fencing of the garden drip irrigation installation and training of staff in horticultural production.

Activity	Months					
	1	2	3	4	5	6
Bush clearing and stumping						
Fencing of the gardening area						
Drip installation						
Initial ploughing and bed making						
Purchasing of gardening equipment and inputs						
Initial cropping						
Monitoring + Evaluation						

Figure 4: Gardening project implementation plan

A cash flow for the 0.7 hectare drip irrigation to be implemented in Phase One is presented Table 5.

ACTIVITY:	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Total YEAR 1
INCOME:													
OPENING Balance	-												-
Butternut	-	-	-					-	-	-			
Cabbage						-							
Onion													
Carrots													
Tomato													
Covo													
Green mealies	-	-	-					-	-				
Total Income	-	-	-										
Total Cash Inflow	-												
Expenditure													
Capital outlay													-
Irrigation infrastucture													
Infrastructure Costs		-	-	-	-	-	-	-	-	-	-	-	
Farm Inputs													
Ploughing		-	-	-	-	-			-	-	-	-	
Labour													
Transport													
Marketing													

Irrigation bills	-	-	-	-	-	-	-	-	-	-	-	-	-
Loan Recoupment		-	-	-	-	-							
Total Running Costs													
Total Cash Out Flows													
Net Cash Inflow/(Outflow)													