VALUE CHAIN ANALYSIS OF SUNFLOWER FOR THE REGIONS OF MOROGORO, IRINGA, MBEYA AND RUKWA

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DRAFT REPORT

Match Maker Associates Ltd

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Acronyms and Abbreviations

Ac Acre
ARI Agriculture Research Institute
ASA Agriculture Seed Agency
ASDP Agriculture Sector Development Program
CBO Community Based Organizations
EU European Union
FFF Farmer Field School
GOT Government of Tanzania
Ha Hectares
Hp Horse Power
Kgs Kilograms
LGA Local Government Authorities
NGO Non Governmental Organisations
MAFC Ministry of Agriculture Food Security and Cooperatives
MT Metric Tonnes
MITM Ministry of Industry Trade and Marketing
QDS Quality Declared Seeds
SHF Small Holder Farmers
SIDO Small Industries Development Organisation
SME Small and Micro Enterprises
SSA Sub Sector Analysis
SUA Sokoine University of Agriculture
TOSCI Tanzania Official Seed Certification Institute
TShs Tanzania Shillings
TZ Tanzania
USA/US United States of America
1.0 Introduction

1.1 Background

Match Maker Associates Limited (MMA) has been contracted by Tanzania Agriculture Partnership to undertake value chain analysis of four commodities in the Southern Corridor of Tanzania namely sunflower, Irish Potato, wheat and soybeans (Soya). In the analysis the consultants were expected to indicate the current profitability by developing templates for each value chain showing constraints and opportunities, income, costs and profitability based on assumptions about existing input and infrastructure costs. Furthermore, the consultant is expected to assess potential yields, production and sales value by the year 2030 (both irrigated and rainfed) assuming necessary investment in infrastructure, access to finance and supportive government policies are in place. Essentially, this exercise is a contribution to the development of Southern Agriculture Growth Corridor (SAGCOT) investment blue print (IBP).

1.2 Approach and methodology

Three main data collection tools were applied in the study, namely; key informant interviews, focussed group discussions and literature review. The starting point was a review of literature available for the relevant commodities. The consultant identified and made use of relevant data (primary or secondary) to the commodities. The study team then proceeded to undertake a field study through meetings and interviews held with key actors (primary and secondary) in the Southern Highlands corridor i.e. Dar es Salaam, Morogoro, Iringa and Mbeya. The field study was implemented to identify the factors, actors, channels and dynamics in the commodities’ supply chains.

Key informant interviews

Inception meetings were held with other consultants who are involved in the SAGCOT exercise. Further interviews with key informants were held with District Agriculture and Livestock Development Officers (DALDOs) and extension staffs in the districts visited, commercial farmers, small, medium and large-scale processors. Visits were made to Kilolo, Iringa Rural, Iringa Urban, Mufindi, Njombe, Makete, Ludewa, Mbarali, Mbeya Rural and Mbozi districts. Additional interviews were also held with individual farmers, processors and traders and staff of NGOs and CBOs active in these commodities. In Morogoro, Dar es Salaam and Arusha further interviews were held with large processors and commercial farmers, Sokoine University of Agriculture, Agriculture Seed Agency (ASA) and Ministry of Agriculture, Food Security and Cooperatives (MAFC).

Focused Group Discussions

Focussed Group Discussions (FGD) were held with farmers’ groups and in some cases with trader groups in all districts visited. FGDs provided relevant inputs for the calculation of profitability of enterprise at the farm/household level and relevant information of commodities trade and marketing.

1.3 Limitations

This exercise was conducted within a month in September 2010. The short duration to undertake this study is seen as the main challenge, which led to limitation in accessing secondary data and primary
data through interviews. It could be useful to visit more districts in the Southern Corridor. Nevertheless, the study team made the best use of the secondary data available from literature and other SAGCOT consultants and made realistic assumptions under which the analysis and recommendations can be validated.

1.4 Structure of the report

This report presents an outcome of the Irish potato value chain analysis in the Southern Highlands corridor in Tanzania. The report is presented in 8 main chapters. The first chapter is introduction to the study. Chapter 2 presents the background information to this study. Chapter 3 presents the proposed clusters where there is potential to upscale production of Irish potato in the corridor. In this chapter potato flows are highlighted including occasional imports and exports from and to the neighbouring countries. Chapter 4 summarises global, regional and Tanzania production and market overview of the Irish potato. Chapter 5 gives the snapshot of the current Irish potato value chain and highlights key actors, functions and dynamics. Chapter 6 presents constraints and opportunities of the Irish potato value chain and chapter 7 brings up future scenarios on production, market demand and its potential impact to income generation for smallholder farmers. Business model required to realize the corridor potential is proposed in chapter 8.

2.0 Sunflower Worldwide

World Sunflower Environment

The Sunflower plant is said to have originated on the North American continent and belongs to the plant genus Helianthus and the family Asteraceae. Its official nomenclature is therefore Helianthus annuus, and it is described generally as an annual plant. The plant consists of the characteristic large flowering head, and leafy stem which can grow to diameters of 30cm and heights of 3 meters respectively. The sunflower plant grows best in fertile, moist, well-drained soil and is propagated by means of open pollination. The plant also grows a deep tap root system which affords the plant some level of drought resisting capabilities. Sunflower can therefore be planted in less fertile and semi-arid areas and it commonly intercropped with or used as a rotational crop or break crop for cereals.

Sunflower has many economic applications, namely; edible oil production, biofuel, animal feed and potentially latex/rubber production. The edible oil has both favourable economic and nutritional implications. It contains a higher level of healthy monounsaturated fats than most other natural oils, making it nutritionally superior to synthetic edible oils and even the much-touted olive oil. The sunflower oil industry also provides employment at the SME level and offers opportunities for export and import substitution at the macro level. The cake, that is a byproduct of oil production, is high in protein and can be used as feedstock for poultry, small animals, pigs, dairy and draught animals.

As indicated above, sunflower seeds can be processed to give edible oil, therefore the plant falls in the category of edible oilseed crops. Other edible oil seed crops include Copra, Cotton (cotton seed), palm,
groundnuts (peanut), rape (rape seed) and soybean. Global oilseed production for 2009 was in excess of 400 million tons, with sunflower being ranked among the top ten oilseeds with a total production of 32,002,190 MT. (FAOSTAT 2009). The largest sunflower oil producing countries are Argentina, China, EU and the US.

The world’s demand for oils and fats has doubled for the last 15 years and is projected to reach 217 million metric tons by year 2030 (Fry 2005). FAO projects the oil seed industry to maintain growth pace among the major agricultural sectors for the foreseeable future.

Globally exports are projected to grow by about 15 million metric tones by 2020. Brazil and Argentina (Soy oil) and Malaysia and Indonesia (Palm Oil) will increase their share. Western Europe and Africa are expected to increase their dependency on imported oils and fats.

Sunflower oil world trade has been stable in the last five production years, with Argentina still holding the leading position in terms of volume traded. The volume traded in 2003 reached 3.4 million tons for US$ 1,583 million. Argentina (30%), Ukraine (27%) and The Netherlands (10%) being the main exporters. On the other hand, The Netherlands (11%), Argelia (8%) and Germany (6%) are the main buyers. The world production of sunflower pellets is also important, as it is the principal grinding sub product. Argentina is the largest exporter, and the European Union the greatest importing block. (USDA; FAS; Circular Series FOP 4-09 April 2009)

Overview of oilseed and sunflower subsectors in Tanzania

Sunflower is one of the most important oilseed crops in Tanzania. The crop is adaptable over a wide range of environments and therefore it is widely cultivated in Tanzania. The crop is popular in the Eastern, Central, northern and Southern Highlands of Tanzania. Sunflower is gaining popularity and current data shows that local production of both factory and home extracted oils contributes to about 40% of the national edible oil requirement with imported oils occupying a significant portion of the remaining 60% (ARI Ilonga, 2008).

In general for farmers in Tanzania, reasonable yields can be achieved using basic inputs and simple farming techniques and the processing of the seeds to derive oil is an economically viable endeavour. The cost of producing sunflower oil in Tanzania is lower than other oil seed crops (sesame, ground nuts), and the crop has the added advantage of superior performance in poorer soils and increased adaptability across various ecological zones, as compared to other oilseeds.

It is also to be noted that there is an actionable local market demand for sunflower oil for domestic use and demand for the by-product seed cake for livestock feeding. In relation to the cooking oil industry, development of the local sunflower oil industry has potential for significant import substitution given that the majority of cooking oil consumed in the country is imported.

Sunflower seed cultivation is the most economical alternative cash crop for smallholder farmers as its profitability margins generally exceed those of other commonly found cash crops. National production
of sunflower has been increasing over the years, and has moved from 80.87 MT in 2000/2001 to 35,000 MT in 2009 (FAOSTAT). The southern region of Rukwa is the second highest sunflower producing region, but there is also significant production in the Iringa region.

Figure 1: Figure showing the top producers of sunflower seed in the world
3.0 Potential Clusters

Figure 2: Figure showing the comparison between total arable land and area under sunflower cultivation for the SAGCOT regions

The above diagram depicts the arable land in the SAGCOT regions as opposed to the area cultivated by sunflower. In each of the regions the total cultivated area is also very low and not exceeding 40% of the total there is therefore tremendous scope for the expansion of sunflower production in each of the regions of Morogoro, Iringa, Mbeya and Rukwa.
4.0 Value Chain map and Dynamics

Figure 3: Value Chain Map for the Sunflower Oil Subsector in the SAGCOT regions

- **CONSUMER**
  - Urban consumer
  - Rural consumer

- **RETAIL**
  - Urban Retailer

- **WHOLESALING**
  - Regional Trader

- **REGIONAL TRADING**
  - Local Trader

- **MILLING**
  - SME Millers

- **LOCAL TRADING**
  - Stockists

- **PRODUCTION**
  - SHF

- **INPUT SUPPLY**
  - SHF

**Channels**:
- Channel I: Farmer/Community Group
- Channel II: Farmer/Community Group
- Channel III: Farmer/Community Group

**Arrows**:
- Green: Inputs
- Orange: Sunflower seeds
- Red: Sunflower Oil

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Inputs -> Sunflower seeds -> Sunflower Oil
At the production level the Sunflower subsector in the Southern Highland regions is characterised by the Smallholder farmers having fields less than 5 acres. On these fice acre plots there is usually mixed cultivation, with the most popular combination being maize, beans, sunflower and groundnuts. The sunflower is usually intercropped with the maize as pure stand cultivation is only seen in the extreme minority of cases.

The sunflower crop when harvested is in most cases sold to local traders either at the farmgate or at the local markets. These traders are either on commission from local processors or are acting independantly. The independent traders may then locate buyers for the seeds, or negotiate with the processors, while the commissioned collectors usually work based on an order from the processor. In a small number of cases some of the farmers also take their seed to the processors themselves.

The processors are the pivotal point for the sunflower oil subsector, as all the seed must pass through these actors. They therefore come into contact with a wide variety of actors and have different types of transactions. The processors who lack capital are simply paid for their milling services, and oil and cake are returned to the trader or farmer who brings it. In other cases the processor may purchase seeds or oil after processsing.

Once the oil is produced, the owner (farmer, trader or processor) may then either sell directly to the rural market, sell to rural retailers, or sell to further traders for movement toward the urban market.

The market for sunflower oil within the southern highland regions is well established and absorbs more than 75% of the sunflower oil produced in the regions. Therefore only a relatively small percentage is traded outside the regions. Local consumers are able to purchase sunflower oil in the following ways:

- from farmers who have paid for the processing of their crop,
- from local traders who have purchased from farmers and paid for the processing
- from processors who have bought either the seed or oil from the farmers
- from retailers who have bought the oil from processors or traders
- from farmer/community groups who own processing equipment

Urban Consumers either obtain the oil from urban retailers, urban wholesalers/retailers or purchase the oil when making trips to the region.

The price of sunflower seeds varies between the two extremes of excess supply, and scarcity. Excess supply occurs usually during the time of harvest since all the farmers in the region harvest simultaneously creating a glut on the market. During this time of excess the price of sunflower seeds reaches an annual low. However later in the year as the supply is consumed, and especially during the time of replanting, the price of sunflower seeds climbs to the year’s highest position.
4.0 Cost and Revenue Drivers and margins

Table 1: Cost Drivers for SHF Mbozi

<table>
<thead>
<tr>
<th>ITEM</th>
<th>TSH</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>RENT</td>
<td>20,000.00</td>
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<tr>
<td>INPUTS</td>
<td>15,000.00</td>
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<td>LABOUR</td>
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<td>60</td>
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<tr>
<td>TRANSPORT</td>
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<td>8</td>
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<tr>
<td>OTHER</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>GROSS PROFIT</td>
<td>4,500.00</td>
<td>4</td>
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</table>
Table 2: Cost Drivers - SHF - Mbeya Rural

<table>
<thead>
<tr>
<th>ITEM</th>
<th>TSH</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>RENT</td>
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<td>16</td>
</tr>
<tr>
<td>INPUTS</td>
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<tr>
<td>LABOUR</td>
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<td>72</td>
</tr>
<tr>
<td>TRANSPORT</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>OTHER</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>GROSS PROFIT</td>
<td>7,500.00</td>
<td>6</td>
</tr>
</tbody>
</table>

Figure 6: Chart showing Cost Drivers - SHF - Mbeya Rural

Table 3: Cost Drivers - Sunflower Processor Mbarali

<table>
<thead>
<tr>
<th>ITEM</th>
<th>TSH</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
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<td>3,568.00</td>
<td>0</td>
</tr>
<tr>
<td>INPUTS</td>
<td>500.00</td>
<td>65</td>
</tr>
<tr>
<td>LABOUR</td>
<td>300.00</td>
<td>9</td>
</tr>
<tr>
<td>TRANSPORT</td>
<td>100.00</td>
<td>5</td>
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<tr>
<td>OTHER</td>
<td>1,032.00</td>
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</tr>
<tr>
<td>GROSS PROFIT</td>
<td>3,568.00</td>
<td>19</td>
</tr>
</tbody>
</table>
6.0 Constraints and Opportunities

Constraints

• Lack of /scarcity of improved seeds which forces farmers to use own seeds leading to low yields
• Hand implements (hand hoes) predominantly used in production leads to poor tillage hence low yields
• Inadequate knowledge on sunflower production techniques due to poor and in some cases inadequate extension services leading to poor crop management and eventually low yield.
• Higher production costs making sunflower seeds and oils expensive
• Low quality of seeds due to poor post harvest handling
• Processing skills are lacking mainly among small holder processors, leading to poor quality products that are not competitive with the market preference
• Unregulated market for sunflower seeds resulting grossly unpredictable prices

Opportunities

• Opportunity for growth of private sector entrepreneurs/farmers, through the supply of quality sunflower seeds by R&D institutions such as ARI at competitive market prices
• Opportunity for training of farmers in improved agronomic practices that allow them to optimize the usage of their land holding and enable the proper use of input supplies for improved productivity.
• Opportunity for the introduction of systems for the training, registration and regulation of sunflower oil processors in order to standardize practices and quality standards
• Opportunity for the training of production and processing actors in order to improve productivity, reduce costs and provide a lower priced, more competitive product for the end market.
• Increasing demand for sunflower oil based on growing health consciousness
• Opportunity for import substitution with the introduction of a competitive local oil
• Opportunity for the introduction of reforms geared toward protection of the local edible oil industry
7.0 Future potential production, consumption/sales by 2030

Production and consumption forecasts
The present edible oil demand in Tanzania is estimated to be 18,000 tonnes per month or 250,000 tonnes a year. This is loosely translated into 273,000,000 liters of edible oil (0.917kg=1 liter edible oil). At present local production of sunflower oil accounts for 40% of this demand, or 109,200,000 liters. The annual import of edible oil into Tanzania is estimated at 200,000 tons, the majority of which is consumed in the urban centers, which as yet has not been significantly penetrated by locally produced sunflower oil.
In addition, the population of Tanzania is expected to increase, from the 2010 estimate of 45 million by 15% to 52 million, in the next five years, and 68% to 75.5 million by the year 2030, which will give a commensurate increase in the consumption of edible oils.

Between 2004/05 and 2008/09 the national production of sunflower in Tanzania has registered a phenomenal growth rate of over 72% per annum. During this period the most significant growth concentrations occurred in the regions of Singida and Dodoma, therefore there is the potential for greater improvement than this in the southern highlands given the comparative advantages in terms of soil quality, irrigation potential and infrastructure.

The potential for the expansion of the area used for sunflower production in the SAGCOT regions is tremendous. As can be seen in Figure 2 above, the present sunflower cultivation is insignificant, occupying less than 1% of the total arable land in each case. The local market for sunflower oil is expanding and there is significant potential for import substitution. Some export of sunflower oil has already begun to large markets such as the Netherlands and there is considerable scope on the ever increasing world market.

It is therefore deemed reasonable with the right support to achieve at least an average of a 100% per year increase in the production of sunflower in the SAGCOT regions. This would give a production figure of 175,000 tons in the next five years and 700,000 tons of sunflower seeds by the year 2030. This would only be possible however with significant input into the following trigger areas.

Triggers to Development

- Improved seeds – the implementation of an effective QDS system that will be effective at making the improved variety seeds available to the farmers in the regions
- Farmer Field Schools – improvement of the number and quality of Farmer Field Schools within the regions will improve the dissemination of proper agronomic practices among farmers in the region
- Input Suppliers – coordinated increase in the number and operation of input suppliers in the regions in order to satisfy the needs of the farmers for the various materials. The dealers must also be monitored to curb unscrupulous activities such as weight tampering, adulterated products, poor quality items and price fixing. This will ensure availability of fairly priced inputs
- Improved infrastructure – improvement in the road and rail systems, supply of electricity, and availability of storage facilities would work toward the overall reduction in the price of production, as greater efficiencies lead to reduced costs.
- Product promotion – promotion of the health benefits of sunflower oil thereby increasing awareness of the product and by extension the demand for the oil
- Improved Policy – synthesis of policies designed to discourage the large scale importation of competing oil products, while providing encouragement for the actors within the subsector

## Market demand potential

<table>
<thead>
<tr>
<th>Crop</th>
<th>Short-term (3-5 years)</th>
<th>Market</th>
<th>Long-term (by 2030)</th>
<th>Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunflower</td>
<td>175,000</td>
<td>Tanzania</td>
<td>700,000</td>
<td>Local and Export (Netherlands and other large markets)</td>
</tr>
</tbody>
</table>

## 8.0 Business Model

The model below displays the proposed optimizing arrangement of actors within the Sunflower oil subsector. The actors and their functions area’s follows:

### Table 4: Business Model Actors

<table>
<thead>
<tr>
<th>ACTOR</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers</td>
<td>Production of Sunflower Seeds</td>
</tr>
<tr>
<td>Farmer Groups</td>
<td>Organisations geared toward the organisation of farmers and the arrangement of farmer capacity building and assistance initiatives</td>
</tr>
<tr>
<td>Central Marketing Organisation</td>
<td>Presiding body that acts as a liaison between the Farmer Groups, the SACCOS, the Large Scale Processor and the WRS. The CMO acts as a general coordinator of the marketing aspects of the model</td>
</tr>
<tr>
<td>Large Scale Producer</td>
<td>Processor with the production and capital capabilities to undertake the processing for a large number of farmer groups from all the regions of SAGCOT</td>
</tr>
<tr>
<td>Warehouse Receipt System</td>
<td>System that arranges the systematic storage of the production of the farmer groups. It acts as a bulking node within the model and feeds directly into the processing, while coordinating financial matters with the SACCOS. Storage within the WRS can be primarily for bulking but also for speculation</td>
</tr>
<tr>
<td>SACCOS</td>
<td>Community based organisation responsible for the availability of capital</td>
</tr>
</tbody>
</table>
needed by the farmers first for production costs, then for provision of advances to farmers depositing their produce at the WRS.

The model first proposes to improve production through the improvement of the process. There will be the introduction of quality seeds, training in agronomic practices, better access to finance and inputs. It also proposes better organisation for the farmers to facilitate collective bargaining, bulk discounts and other possible economies all geared toward improving productivity and profit. The model also brings together many aspects that are geared towards improving the existing norms. The SACCOS is expected to make capital available to the farmers thereby giving them the opportunity to purchase the inputs needed to augment their production. The farmer groups will act as coordinating bodies for the organisation and improvement of the farmers. They will be involved in the implementation of the QDS, training and marketing initiatives, mobilization and monitoring of the individual farmers, leading to improved farmer performance. The Central Marketing Organisation (CMO) will coordinate farmer group operations and manage marketing and financial
activities with the SACCOS, WRS and Processor. The WRS will provide collective storage as well as speculation opportunities for the farmers while creating an opportunity for reliable supply for the processor. The large scale processor is expected to achieve economies of scale and thereby reduce the cost of sunflower processing and make the product more competitive. There is also the opportunity for the production of a well-branded product with the availability of capital.

The model and actors described above are relevant if supported by the following actors:

- Local Bank - to provide financial services in support of the SACCOS
- Ministry of Agriculture – to provide extension support to farmers
- Research institute - to provide R&D support in the formulation of quality seeds as basis for QDS system
- Agricultural input supplier – to provide good quality inputs at fair prices throughout the corridor

References

