



Sunflower Sector

Market Development Strategy



November 2008

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS	- 4 -
EXECUTIVE SUMMARY	- 5 -
1.0 INTRODUCTION AND BACKGROUND	- 6 -
2.0 MARKET AND PRODUCTION ANALYSIS	- 6 -
2.1 National Demand and Supply.....	- 6 -
2.2 Analysis of Market System.....	- 8 -
2.2.1 Input Supply	- 9 -
2.2.2 Production.....	- 10 -
2.2.3 Bulking	- 11 -
2.2.4 Seed Crushing.....	- 11 -
2.2.5 Refining.....	- 12 -
2.2.6 Wholeselling / Exporting.....	- 12 -
2.2.7 Retailing	- 12 -
3.0 CHALLENGES AND OPPORTUNITIES	- 14 -
3.1 Production Challenges.....	- 14 -
3.1.1 Quality Seeds	- 14 -
3.1.2 Agronomic Practices.....	- 14 -
3.1.3 Sales Practice	- 15 -
3.2 Processing Challenges.....	- 15 -
3.2.1 Capacity and Supply Mismatch.....	- 15 -
3.2.2 Oil Quality	- 15 -
3.2.3 Marketing	- 16 -
3.3 Opportunities.....	- 17 -
4.0 PROPOSED PROJECT.....	- 17 -
4.1 Lessons Learned from the Previous Phase	- 17 -
4.2 Project Objective.....	- 18 -
4.3 Proposed Interventions.....	- 19 -
4.3.1 Seed Production and Marketing	- 19 -
4.3.2 Improvement of Production and Sales through Contract Farming	- 19 -

4.3.3 Pollination for Increased Yield.....	- 20 -
4.3.4 Business Plan for Refinery.....	- 21 -
4.3.5 Improvement of Oil Branding and Marketing.....	- 21 -
4.4 Expected Income from Interventions	- 22 -
4.5 Project Partners.....	- 23 -
4.6 Risk Analysis	- 24 -
4.6.1 Unfavourable Government Intervention	- 24 -
4.6.2 Unfavourable Weather Conditions	- 24 -
4.7 Project Budget.....	- 24 -

LIST OF ANNEXES

Annex 1: Project Budget.....- 25 -

Annex 2: Implementation Schedule.....- 28 -

Annex 3: Causal Monitoring Model- 29 -

ACRONYMS AND ABBREVIATIONS

ARI	Agricultural Research Institute
CEZOSOPA	Central Zone Sunflower Processors Association
CTI	Confederation of Tanzanian Industries
DALDO	District Agricultural and Livestock Development Officer
ESRF	Economic and Social Research Foundation
EU	European Union
FAO	Food and Agricultural Organization
FGD	Focus Group Discussion
HCT	Honey Care Tanzania
MAFSC	Ministry of Agriculture, Food Security and Cooperative
MITM	Ministry of Industries, Trade and Marketing
NGOs	Non-Government Organizations
QDS	Quality Declared Seeds
R & D	Research and Development
RFA	Radio Free Africa
RLDC	Rural Livelihoods Development Company
SACCO's	Savings and Credit Cooperative Organizations
SUA	Sokoine University of Agriculture
TASO	Tanzania Agricultural Society Organization
TBS	Tanzania Bureau of Standards
TCCIA	Tanzania Chamber of Commerce, Industry and Agriculture
TFDA	Tanzania Food and Drug Association
TOSCI	Tanzania Official Seed Certification Institute
USA	United States of America

EXECUTIVE SUMMARY

RLDC intends to facilitate market development on the sunflower sector by incorporating lessons learned in a previous phase and testing the experience gained for dissemination and replication to the wider sector. To achieve this goal RLDC carried out a market system analysis in the sector and the following is the summary of the findings of the assessment.

Market and production analysis: National demand for edible oil is huge compared to national supply, which has forced the country to largely rely on imported palm oils. This has the impact on country foreign exchange reserve as well as the suppression of local production of oilseeds like sunflower.

Market system analysis: The value chain in sunflower sector, thus from input usage, through production and processing to marketing is compounded by a lot of technical and institutional impediments and this is due to the fact that, the sector is dominated by small producers and processors who lack technical and financial capability to run it efficiently and profitable.

In order to improve the sector, RLDC has come forward with the following five areas of intervention.

- i. ***Seed production and Marketing*** – RLDC intends to provide software grants through Challenge Fund of Tshs 150 Mill to seed producers for establishing seed production farms, training of farmers in seed production and establishment of extension services for seed production.
- ii. ***Improvement of production and sales through contract farming*** – RLDC intends to take a more active role in facilitating contract farming scheme by working out the content of such contracts, securing agreements, and implementing the contract, if become successful the model will be disseminated to other processors in a replication phase.
- iii. ***Pollination for increased yield*** – RLDC is planning to work with one partner to increase the sunflower yields through improved pollination by bees, where 40 colonised beehives will be installed in 10 acres comparing with other 10 normal pollinated acres.
- iv. ***Business plan for refinery-*** In order to attain its vision of starting an oil refinery plant in central corridor in a next two years, RLDC intends to help interested investors building their capacity through training and advisory services.
- v. ***Improvement of oil branding and marketing*** – Since small processors in central corridor lack market strategy know how, RLDC intends to build their marketing capacity through training and implementation of marketing measures.

Project Budget-The project is envisaged to cost a total of Tshs 503,450,000/=, where RLDC will contribute Tshs 348, 450,000/= and our partners will contribute a total of Tshs 155, 000,000/=.

1.0 INTRODUCTION AND BACKGROUND

In its first program phase, RLDC supported 8 market linkage projects between small sunflower farmers and processors or buyers. Experience from the first phase has shown that sunflower is one of the largest agricultural sub-sectors in the Central Corridor and consequently the sunflower sub-sector has also been selected for the broader approach of facilitating market development in the second phase of RLDC.

Sunflower oil makes about 13% of the world oil production. The sunflower (*Helianthus annuus*) originated from America and was brought by the Spanish to Europe. It was later introduced in Russia, Ukraine, and Turkey which are up to now main production countries apart from the USA and Argentina. Sunflower was introduced in Tanzania during colonial times and it was found to grow in almost all parts of the country. The crop is however very interesting as it does well in the dry weather conditions of the Central Corridor where other crops, like maize and wheat, do not do so well. Sunflower in the Central Corridor is also interesting from a pro-poor or welfare perspective as most of the sunflower is grown by small farmers.

The project document at hand focuses on the testing and demonstration phase of the sunflower market development. Although RLDC learnt a lot of lessons from the supported projects in the first phase, there was not enough well-tested experience that could be straight away disseminated and replicated. This is the main reason that this project re-visits some of the issues that have already been addressed in the first phase but now much more from a perspective of developing the entire sector.

2.0 MARKET AND PRODUCTION ANALYSIS

2.1 National Demand and Supply

FAO recommends a minimum annual per capita consumption of 5 kg of vegetable oil. With a population of about 37 million people, the minimum national demand for edible oil is expected to be about 185,000 tons per year, but the actual national demand is probably much higher, although there are no reliable figures available. Demand for vegetable oil is at least growing with the rate of population growth.

The production of oilseeds in Tanzania mainly focuses on ground nuts (40%), sunflower (36%), sesame (15%), cotton (8%), and palm oil (1%). The palm tree nuts have the highest oil content (46% – 67%) than its counterpart; however the palm tree requires specific climatic conditions which are only found in some parts of Tanzania. Nevertheless palm oil production is promoted in Kigoma. While there is a large

production of other oilseeds such as groundnuts and sesame, there are has been no substantial oil production from these seeds, thus making sunflower oil the most important vegetable oil produced in Tanzania.

While the production of sunflower oil seeds was varying between 75,000 to 100,000 tons in year 2001 to 2005, it increased in the last two seasons dramatically to more than 350,000 tons (source MAFSC). The corresponding sunflower oil production increased to almost 90,000 tons of oil per year (source MAFSC)

Year	Sunflower oil (tons)
1999 / 2000	11,560
2000 / 2001	19,409
2001 / 2002	25,056
2002 / 2003	26,986
2003 / 2004	25,515
2004 / 2005	21,325
2005 / 2006	89,614
2006 / 2007	88,753

Although there has been a significant increase in edible oil production (sunflower, palm, ground nuts, sesame) in recent years, this increase has never exceeded 100,000 tons which in turn has forced the country to import vegetable oil in order to meet its domestic demand. The import is mainly palm oil from Malaysia and Indonesia. These imports are in form of crude, semi-refined, and refined qualities.

Year	Edible oil imports	Palm oil imports
2001	187,000	177,000
2002	157,000	147,000
2003	185,000	167,000
2004	160,000	155,000
2005	258,000	250,000
2006	282,000	268,000

Source MA-POTS, 2007

Based on the figures above, it can be concluded that annual national consumption of vegetable oil is much higher than the FAO minimum consumption and / or there are significant exports of vegetable oil to neighboring countries. Whatever the case, Tanzania is a net importer of vegetable oil which is a considerable drain on foreign currency. Due to the high palm oil prices last year, the importation of vegetable oil became the second largest import item for Tanzania (after petroleum).

Although Tanzania is a net importer of vegetable oil, there are significant exports of sunflower seeds and oil, mainly to neighboring countries like Burundi, Rwanda, and

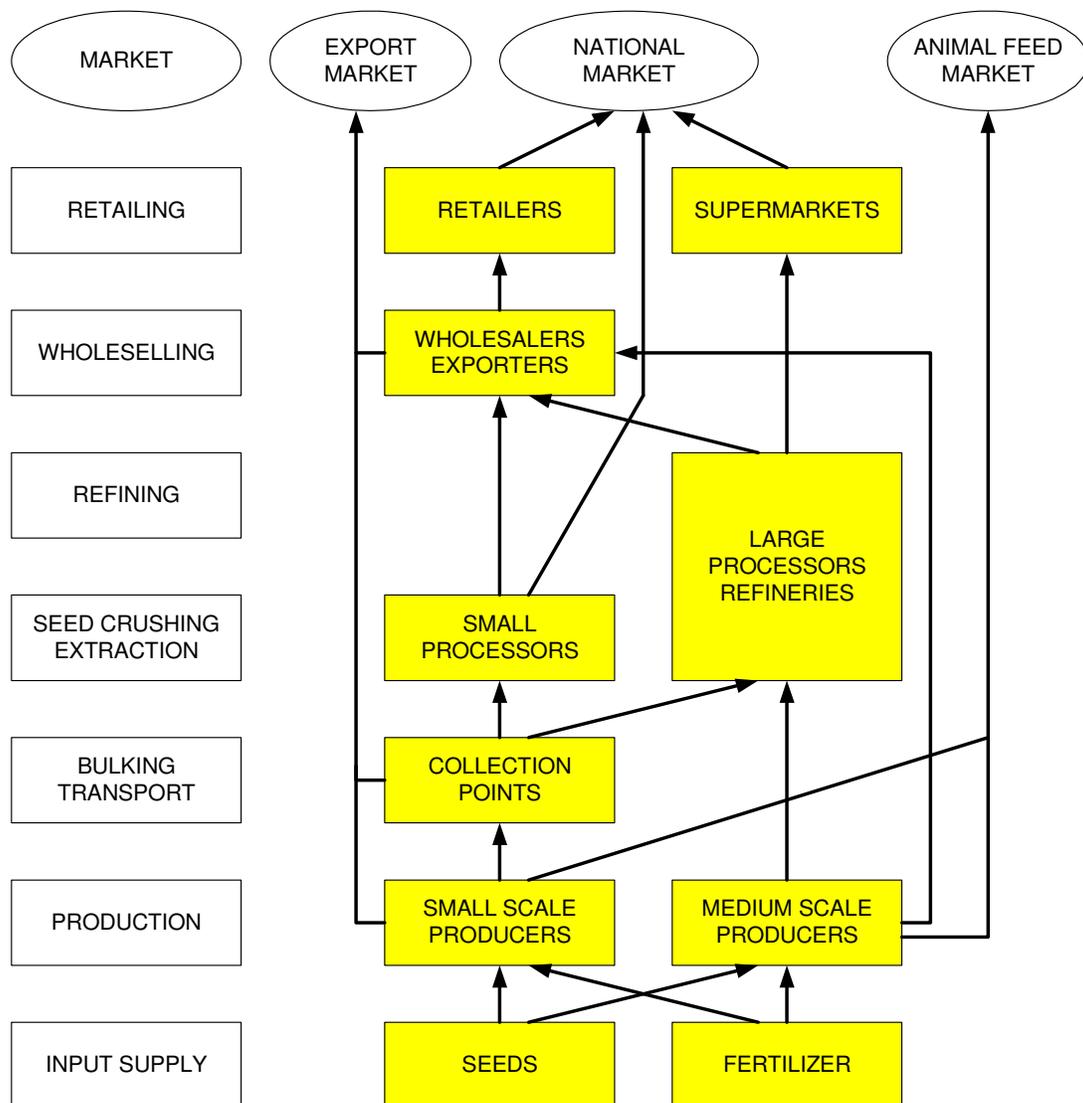
Kenya. There are a few exporters who managed to even sell small quantities of oil to the EU, mainly based on their good quality.

A good proportion of the Tanzanian consumers prefer local sunflower oil to imported oils (source ESRF study). This is noteworthy as local oil is often not refined and more expensive than imported palm oil.

An important by-product of seed crushing is the sunflower cake. The cake constitutes the rest of the input materials after the oil has been extracted. It makes therefore about 45 kg in every bag of crushed sunflower seeds. As there is no substantial animal feed industry in Tanzania, the cake is mainly bought by individual livestock keepers and traders. Export of sunflower cake fluctuates considerably.

2.2 Analysis of Market System

The Sector Map of sunflower production and marketing indicates the most important actors in the sector.



2.2.1 Input Supply

Main inputs in sunflower production are seeds and fertilizer. The majority of small farmers use traditional or recycled seeds whose germination rate is rather low. The recent outbreak of fungus disease is also attributed to the use of recycled seeds. Fertilizer, i.e. manure is not commonly used as it is expensive or not available.

Seed production and certification in Tanzania is governed by the Seed Production Act 2003, amended in 2007, and administered by the Ministry of Agriculture, Food Security, and Cooperatives. There are currently 20 registered entities in Tanzania whose work is being monitored by TOSCI. The process of seed production goes through three different levels:

Breeder Seeds: They are produced in very small quantities by research centers, like Ilonga

Foundation / Basic Seeds are produced by the Agricultural Seed Agency based on the breeder seeds. These farms are Msimba farm in Kilosa and Naliendele farm in Mtwara.

Certified Quality Seeds are then produced on the basis of foundation seeds by other registered seed producers. In the Central Corridor only producers are licensed for production of certified quality seeds: STRAD, a former project partner of RLDC, and TANSEED are licensed to produce quality sunflower seeds.

As there are only two seed producers in the Central Corridor, the Ministry has encouraged selected small farmers to produce Quality Declared Seeds (QDS) in collaboration with the local District Councils.

There is a general shortage of quality sunflower seeds country wide. In the Central Corridor it is estimated that only 35% of sunflower farmers use Certified Quality Seeds or QDS. It is therefore important to increase the production and distribution of quality seeds so that more farmers can improve the germination rate and subsequently the yield of sunflower. From experience in previous projects and from the FGD's, RLDC has learnt that the use of quality seeds increases yield from 3 bags to 12 – 15 bags per acre. In addition the oil processors prefer to buy the quality seeds because of the higher oil content and pay therefore higher prices for these seeds. Altogether the higher yield and the better prices result in a tenfold income increase for the small farmers (source RLDC FGD's in six regions).

QDS seeds have been sold to farmers for about Tshs 2,500 to Tshs 3,000 per kg and about 4 to 5 kg of seeds are recommended per acre.

Many small farmers do not use fertilizer in sunflower production. This is mainly attributed to the high cost or even non-availability of manure. However farmers who used manure, reported on higher yields (source RLDC FGD's in six regions).

2.2.2 Production

Sunflower production is predominantly done by small farmers with one to three acres under sunflower. There are however also medium or large scale farmers with more than a thousand acres of sunflower. Based on the annual production of 2006 / 2007 and an assumed yield of about 0.6 tons per hectare it is estimated that an area of about 600,000 hectares has been cultivated with sunflower last season. The crop is grown all over Tanzania but over 50% of sunflower is planted in four regions: Dodoma (22.5%), Kilimanjaro (13.2%), Arusha / Manyara (13.1%) and Singida (8.9%). Other major growing areas are Mbeya, Mtwara, and Rufiji. As the majority of sunflower farmers are

small scale farmers who grow one to three acres sunflower, it is estimated that about 150,000 to 200,000 small scale farmers are involved in sunflower growing.

The process of sunflower farming includes land preparation (ploughing), planting, regular weeding, and harvesting. While medium and large scale farmers use tractors for ploughing, such services are only available for very few small scale farmers. As smallholder farmers use only hand tools they can only work on a maximum of two to three acres.

Small sunflower farmers do not have storage facilities and are interested to sell their crop soon after the harvest. Last season the price for one bag of sunflower seeds was at that time about Tshs 25,000 while later increased to about Tshs 35,000 per bag. The net income of farmers varies considerably depending on the yield. The RLDC FGD's revealed that the net income ranged from Tshs 11,000 per acre for farmers who did not use quality seeds and apply modern agronomic practices to an amount of Tshs 110,000 per acre for those farmers who made the necessary investments. In some cases the net income even reached Tshs 150,000 per acre

2.2.3 Bulking

Bulking is normally done by packing the oilseeds into sacks/bags and then storing them in a warehouse or collection centre ready for selling. If farmers are not organized the bulking is often done by middlemen who sell the crop later to the processors. This practice normally results into low prices for farmers as their potential bargaining power is not fully utilized.

In case farmers are organized and / or operate a collection point, they will do the bulking themselves and claim back the price differential from the middlemen. The collection point may be owned and managed by the farmer groups or the buyer. In last phase RLDC in collaboration with processors established about 15 collection points in its sunflower projects. These centers are equipped with weighing scales in order to minimize sales basing on volumes for better prices. Furthermore, each center were equipped with 500 -700 sunflower collection bags depending on the size of the centre in order to reduce transaction costs to both farmers and buyers

2.2.4 Seed Crushing

Most of the seed crushing is done by small oil mills that are able to crush 30 to 50 bags of sunflower seeds per day. Medium scale mills can crush about 150 to 200 bags per day. Based on sunflower seed and oil production in 2006 / 2007 and assuming 250 working days it is estimated that all oil mills together crushed about 17,000 bags of

sunflower seeds on the average per day. The installed capacity of mills is higher but unknown.

The process of crushing includes wheening and removing of foreign particles, crushing, filtering, and oil storing. In many small crushing units the oil is then filled into plastic containers and sold to the market. The sales price of the sunflower varies but it is about Tshs 2,000 per liter if the oil is packed in a five liter container.

There are only few chemical extraction facilities in the country. In the Central Corridor only the ABOOD group owns an extraction plant but does not operate it due to insufficient throughput quantities.

2.2.5 Refining

Refining includes neutralizing the oil with alkali, washing with water, dewaxing or dewinterizing, bleaching with bleaching earth or activated carbon, and deodorizing with steam or by heating. Only Murza and Mount Meru oil millers do currently refine sunflower oil.

2.2.6 Wholeselling / Exporting

Wholeselling is mainly done if the oil is taken up-country, to urban centers, or to neighboring countries. Normally the wholesaler places his orders directly with the small or medium scale seed crushing company.

2.2.7 Retailing

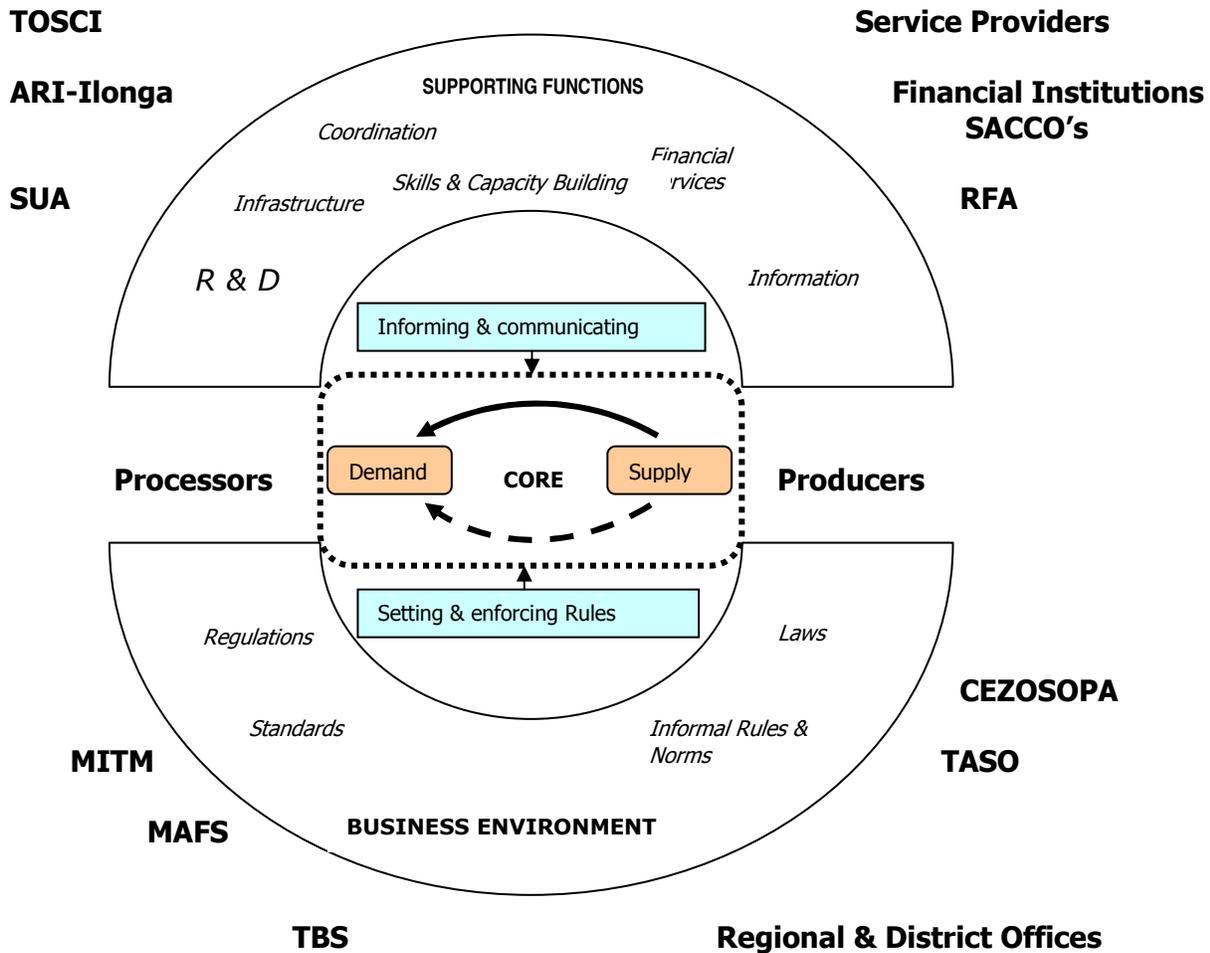
Only well-packaged and labeled sunflower oil is sold in kiosks. Most supermarkets in Dar es Salaam and Arusha do only stock refined sunflower oil. They also sell imported sunflower oil. The average retail price for refined sunflower oil is between Tshs 3000 for local oil and Tshs 5,000 or more per liter for imported oil.

In the centre of the market system of support services and business environment is the **core transaction** along the value chain as described above. There is in summary a mismatch between producers, processors, and consumers in the sunflower sector.

Important market players in the support functions include seed producers, the Ilonga Research Institute, SUA, and service providers. Financial services to the sunflower sector focus mainly on processors but have yet not been addressing warehouse systems for small processors. Financial services for small farmers are only provided by few

SACCO's. Additional support is expected through the RLDC facilitated radio program for small producers.

Important market players in the business environment are TOSCI that controls the quality of seeds, TBS and TFDA that oversee the quality of oil production, and business member organisations like CEZOSOPA, TCCIA, and CTI.



3.0 CHALLENGES AND OPPORTUNITIES

3.1 Production Challenges

In the first phase RLDC supported 8 market linkage projects in the sunflower sector. The assessment and monitoring of these projects provided us with some valuable lessons learnt. More recently RLDC carried out 12 Focus Group Discussions in the six regions of the Central Corridor (with altogether 120 small farmers) which gave us more insights particularly in the production of sunflower by smallholder farmers. The constraints are related to three major issues:

3.1.1 Quality Seeds

Most of the small farmers do not use quality seeds, instead they use recycled seeds and traditional seeds from other farmers. The use of the wrong seeds is often a mixture of ignorance, lack of capital, and non-availability of quality seeds. Sometimes the farmers buy seeds that have not been certified for their area and they then face a low and disappointing germination rate, although the use of the same seed in the certified areas can produce a high germination rate.

Traditional or recycled seeds sold last season at about Tshs 500 per kg whereas QDS sold at Tshs 2,500 to Tshs 3,000 per kg. The quality seeds were obtained from traders, cooperatives, DALDO, and NGO's, however seeds were not available in sufficient quantities so that interested farmers had to source seeds from different suppliers. Another problem was last year that even when quality seeds were obtained they were often planted in smaller quantities as per requirement so that yield per acre was still low although the germination rate was high.

3.1.2 Agronomic Practices

Many small farmers do not apply proper agronomic practices in land preparation, planting, weeding, and using of fertilizer. Where land is not a limiting factor, crop rotation and intercropping is not properly practiced, although it would allow soil replenishment. The government extension service does still not provide enough support in introducing better agronomic practices.

The yield is therefore much lower than expected. Inadequate agronomic practice is the result of ignorance, low motivation, and in some cases the lack of ploughing services or fertilizer.

3.1.3 Sales Practice

The common sales practice of individual sales of sunflower grains makes small farmers vulnerable to manipulations by the buyers let them be middlemen, traders, or processors. The practice of off-farm sales gives away the opportunity of bulking and possible the direct contact with traders or processors. The lack of weighing scales makes it necessary to sell the crop by volume rather than weight which in most cases are to the disadvantage of the small farmer. Based on these sales practices, the smallholder farmer receives indeed low prices.

3.2 Processing Challenges

As illustrated above the oil processing companies can be broadly grouped into small scale seed crushing companies and oil refinery companies. The constraints of these companies are as follows:

3.2.1 Capacity and Supply Mismatch

Like with most agricultural produce, sunflower seeds are mainly available at the end of the harvest. Since most small farmers do not have storage facilities, they want to sell their produce as soon as possible, and it is left to the processor to balance the purchase of sunflower grains, process them to oil, and meet the regular demand of the consumer markets. While the crushing equipment is a relatively small investment, the processor has to spend much higher amounts for buying and storing the sunflower grains to enable him to meet demand continuously. If, for example, a processor has installed a crushing capacity of about 50 bags per day, he would need to purchase about 10,000 bags if he wanted his machine to be active during 200 days. The purchase requires a capital of about Tshs 300 million which is far in excess of the machinery investment costs.

At the same time, processors are sometimes not able to buy sufficient quantities of sunflower seeds at going prices. This is mainly the consequence of not having a reliable and trustful business relationship between the small farmers and the processors. In past projects, even in the case of contract farming, relationships were unstable and a lot of side-selling rendered the contracts almost useless.

3.2.2 Oil Quality

According to the Tanzania standard for sunflower oil, the Tanzania Bureau of Standards (TBS) specifies that,

Raw sunflower oil

This is oil obtained by a process of mechanical expression and / or solvent extraction. The oil should be pure and not contain any particles, sediments, foreign matter or contamination.

Refined sunflower oil

This oil has been obtained by expression and / or extraction and in addition it has been neutralized with alkali, washed with water, dried, bleached with bleaching earth or activated carbon, and deodorized with steam. No other chemical agent is allowed in this process except citric acid.

Sunflower oil for edible purpose shall contain antioxidants and antioxidant synergists in specified levels.

Some seed crushing companies do not treat the oil before they fill it into small plastic containers of varying size but many companies filter the oil to remove any strange particles from it. In doing so, they probably meet the standard for raw sunflower oil. Currently only Murza Oil Millers and Mount Meru Oil Millers produce refined sunflower oil in the country. In some supermarkets in Dar es Salaam, imported refined sunflower oil is being sold.

According to the Tanzania Food and Drugs Authority (TFDA) sunflower oil for human consumption should be refined. If raw sunflower oil is consumed shortly after expression or extraction, it probably does not do any harm. If raw sunflower oil has however been stored for a long time or exposed to high temperature fluctuations, it is not advisable to consume it any more. As most raw sunflower oils are not labeled or the date of processing has not been indicated on the label, it is difficult for the consumer to know whether the oil is still edible.

3.2.3 Marketing

Most sunflower seed crushing companies sell the oil almost like a commodity in unidentifiable containers without proper labeling. Last year RLDC introduced the label of "TOP" sunflower oil which was supposed to become the brand of the members of the association of oil millers in the Central Corridor (CEZOSOPA) but except during the recent Nanenane Show in Dodoma the label is widely used. The "TOP" label also suffers from an unidentifiable container as the same container is used with their own labels by all members of CEZOSOPA.

As there is also hardly any market segmentation, promotion or advertising effort, one cannot help noticing that most oil mills need to develop a marketing concept for increasing their sales. The view that marketing concepts are not necessary because the

mills sell all their oil is a false argument as they could most likely increase their sales with a more focused approach.

Notably the two refineries apply better marketing and consequently sell their products at higher price levels.

3.3 Opportunities

The increased production and improved marketing of sunflower oil offers several opportunities at the different levels of the value chain:

- Sunflower grains are produced by many small farmers in the Central Corridor. Increased production creates a substantial opportunity for increased income and improved welfare of small farmers
- Sunflower oil is relatively easy to produce (at least raw sunflower oil) with a small investment into machinery. Oil production constitutes therefore an opportunity for small oil processors
- Sunflower oil is excellent for human production as it is low in cholesterol. As speciality sunflower oils with high mineral content fetch extra premium prices, it might be worthwhile to further explore this opportunity
- Increased production of sunflower oil reduces the dependency of vegetable oil imports and improves therefore the foreign currency situation for Tanzania.

4.0 PROPOSED PROJECT

4.1 Lessons Learned from the Previous Phase

In its first phase, RLDC supported mainly market linkage projects with small processors and small farmers of sunflower grains. The small processors did not use contract farming per se but rather aimed at improving their relationship with the small farmers through training in agronomic practices and establishing collection centers. However the success of these efforts was varied:

- Some processors did not invest much time and effort in improving their relationship with small farmers. Subsequently the farmers felt not obliged to sell to them and they sold to other processors or dealers
- Most processors did not have enough working capital to buy grains at harvest time and farmers were discouraged and started selling to other parties
- Although farmer groups were established in all projects, some groups did not perform well in terms of bulking and running the collection centre. There were however also some good examples where the groups performed well and negotiated for higher prices

In one project, the project partner was supposed to use contract farming but it turned out that he was not able to implement it due to personnel constraints.

4.2 Project Objective

It has been estimated that last season about 175,000 tons of sunflower seeds have been produced on about 290,000 ha¹ in the regions of the Central Corridor. The vision of RLDC is to see the production increased to 230,000 tons in the next two year due to an increase of sunflower acreage to 330,000 ha and an increase of yield from 9 bags² per ha to about 10.7 bags per ha on the average.

If the vision is realized it would have several effects:

- i. Sunflower oil production in the Central Corridor would increase from about 52,500 tons to 69,000 tons and increase significantly local oil production³.
- ii. Based on an average price level of Tshs 25,000 per bag of sunflower seeds the increase of sunflower grains production would correspond to an additional gross income for small farmers of about Tshs 21 billion.
- iii. Based on an average price of Tshs 2,000 per kg of pressed raw oil, the additional oil production would result in an additional gross income for oil processors of about Tshs 33 billion from oil alone⁴.

It is estimated that about 362,500 small farmers⁵ in the Central Corridor plant sunflower. The vision above means that the average yield increases from about 3.6 bags per acre to 4.3 bags per acre. Assuming that the number of small farmers remains constant, the increase in yield can be achieved if at least 25,000 more farmers use quality seeds and apply modern agronomic practices and achieve a yield of at least 8 bags per acre on the average. As our research has shown that some farmers achieve a yield of up to 12 bags per acre, the target seems achievable.

¹ This estimate assumes an average yield of about 0.6 tons per ha

² A bag contains about 65 kg of sunflower grains

³ One kg of sunflower grains contain about 0.3 kg of oil

⁴ Not considering the income from the additional sunflower cake

⁵ 290,000 ha corresponds to about 725,000 acres. Assuming the average small farmer plants about 2 acres of sunflower, the estimated number of sunflower farmers is 362,500

4.3 Proposed Interventions

RLDC interventions mainly aim at improving the yield of sunflower seed production and the quality and marketing of sunflower oil. This may also create an increasing effect on the sunflower acreage and the number of small sunflower farmers, but only indirectly.

4.3.1 Seed Production and Marketing

In order to achieve the vision of an additional 25,000 small farmers who use quality seeds, it is necessary to produce an additional quantity of about 250 tons of quality seeds. As described above this can be either Quality Declared Seeds produced by selected small farmers or Certified Seeds produced by registered seed producers. As there are currently only few companies of both categories in the Central Corridor, RLDC intends to introduce a **Challenge Fund** of Tshs 150 million for the establishment of new seed producers or expansion of existing seed producers. Through the fund RLDC intends to facilitate the establishment or expansion of up to four producers of certified seeds or up to fifty small producers of QDS.

The Challenge Fund will provide software grants for establishing seed production, for example for organization of farmers, training of farmers in seed production, establishment of extension service for seed production, etc. RLDC will announce the Challenge Fund through the media and interested companies may apply for the fund by submitting a comprehensive business plan for establishing a new seed production or expanding an existing seed production. The applicants should also provide evidence how they are going to meet the necessary investment costs into hardware items. Application guidelines, criteria for selection, and details of the selection process will be worked out prior to the announcement in the media.

The main activities of this intervention include

- i. Identify small producers of QDS and work out strategic focus of Challenge Fund
- ii. Drafting of guidelines for Challenge Fund
- iii. Advertizing for Challenge Fund
- iv. Receiving applications, assessing and selecting applications
- v. Contracting selected partners
- vi. Monitoring interventions

4.3.2 Improvement of Production and Sales through Contract Farming

In the given market situation, RLDC considers contract farming to have a huge but untapped potential that could address the problems of services to the small producers, provision of quality seeds, introduction of better agronomic practices, and last but not

least a better relationship and harmonization between small farmers and processors. However this time RLDC intends to take a more active stand in facilitating to work out the content of such contracts, securing agreements, and implementing the contract. In this respect RLDC will work with one partner with the aim to establish a model for the contract creation and implementation. The outreach at this stage is expected to be at least about 1,000 small farmers. RLDC shall then disseminate the successful model to other processors during the subsequent replication phase.

The main activities of this intervention include

- i. Identifying needs of small farmers and processors that will be addressed in the contract
- ii. Drafting of contract with the help of an (international) consultant
- iii. Getting broad consensus and agreement on the contract
- iv. Supervising implementation process of the contract
- v. Monitoring intervention
- vi. Developing a model process and content of the contract

RLDC intends to support some of the likely needs but is not restricted to them. The likely needs may include organization of farmer groups, provision of quality seeds, provision of ploughing services, provision of training on agronomic practices, provision of extension services, establishment of collection points, etc. An important aspect of contract farming is the provision of financial services that RLDC will not be able to provide but a link to financial institutions shall be established.

4.3.3 Pollination for Increased Yield

There are various ways of increasing yield of sunflower seeds production. These include the use of hybrids, improved pollination etc. In Uganda, for instance, they have started using successfully hybrid seeds from South Africa. In our case we have planned to adopt the second option, the improved pollination, because it is cost effective and environmentally benign.

A more natural way of increasing the yield of sunflower seeds is pollination by bees during the flowering period. Well researched examples from Turkey show that a total of about 4 colonized beehives per acre of sunflower ensure adequate pollination that is estimated to result in higher seed production of about 30%. The four bee colonies are also expected to produce about 100 pounds of honey during the entire flowering period. The pleasant flavored and yellow coloured honey is considered a special honey that fetches a premium price.

It is planned to use 40 colonized beehives on 10 acres and compare the yield results with another normal-pollinated 10 acre field using the same seeds and agronomic practices. The testing will take place on the 1,200 acres farm of our project partner near Kibaya in Manyara region. Through pollination it is expected that the yield will

increase by at least 3 to 5 bags per acre because of improved pollination. If the test results become positive, pollination services shall be developed and offered to all sunflower farmers.

The main activities of this intervention are:

- i. Site planning
- ii. Installing and managing colonized beehives,
- iii. Monitoring of intervention
- iv. Developing pollination as a service product

If successful, the replication of pollination as a service product shall be supported at a later stage.

4.3.4 Business Plan for Refinery

RLDC understands that in the not so distant future refined sunflower oil becomes the standard for edible sunflower oil in Tanzania. Raw sunflower oil might only enjoy a niche market for special applications.

Although the sunflower refinery plants are basically established through private investment, where RLDC cannot offer any assistance, RLDC intends to smoothen the path of interested investors through training and advisory services. The intervention includes the following activities:

- i. Awareness creation workshop for seed crushing companies on the standard for refined sunflower oil, the refining process and required machinery
- ii. Facilitation of visits of interested investors to trade fairs and shows to identify appropriate refining equipment
- iii. Facilitation of advisory service for preparation of business plan for refinery
- iv. Facilitation of contacts to financial institutions that are willing to provide the necessary investment funding

The aim of this intervention is that one sunflower oil refinery is established in the Central Corridor in the next two years.

4.3.5 Improvement of Oil Branding and Marketing

As mentioned before, most small mills market the sunflower oil like a commodity and do not well position their products in the market. With this intervention RLDC will build the marketing capacity of small processors in the Central Corridor and facilitates the implementation of marketing measures. The aim of the intervention is to significantly increase (at least 10%) the income of small processors as result of higher achievable prices.

The intervention will focus on the following main activities:

- Facilitating a series of short marketing courses for small processors
- Establishing and implementing a small fund of Tshs 30 million for proposed marketing measures of small processors
- Receiving applications for using fund from successful training graduates
- Monitoring the implementation of the marketing measures

Through the fund, RLDC will provide grants to small processors who want to improve their marketing based on the knowledge they gained during the training. Interested processors may apply for the fund by submitting a detailed plan for the proposed measure. The financing of the measures is based on a 50:50 cost sharing arrangement between RLDC and the applicants.

RLDC will announce the fund in the training course and the media. Application guidelines, criteria for selection, and details of the selection process will be worked out prior to the announcement in the media.

4.4 Expected Income from Interventions

As stated above this sector strategy focuses so far only on the testing and demonstration and is therefore not expected to achieve a high outreach and increase of income. Nevertheless it is expected that the proposed interventions will already now produce some impact

Intervention	Expected Result	Expected Outreach	Expected Income
Production and marketing of quality seeds	Increase of quality seeds production by 250 tons	25,000 small farmers	Tshs 21 billion for farmers Tshs 33 billion for processors
Contract farming for improvement of production	Improved yield through better seeds and practices	1,000 small farmers	Tshs 300 million for farmers
Pollination for increased yield	Increased yield by 3 bags per acre	n.a.	Tshs 75,000 per acre
Business Planning for refinery	Increased income for processors/refineries	one	n.a.
Improvement of oil branding and marketing	Increased income for procesors/refineries	10	n.a.

4.5 Project Partners

In the five interventions, RLDC shall work with minimum of three different project partners.

The Challenge Fund for existing and new seed producers is open to all private sector companies that have the expertise in producing quality seeds, for example TANSEED, STRAD. As applicants have to provide RLDC with their company details with the business plan, a due diligence test will be carried out before funds are released. The fund will also be open to small producer of QDS. Their assessment will be done with support of TOSCI and other agencies.

The partner of RLDC in contract farming will be Kiteto Agribusiness who has already been our project partner in Dodoma region in the first phase but in another sector. The addition of Manyara region to the portfolio of RLDC, offers the opportunity to work with Kiteto Agribusiness directly in Manyara where they have a much bigger operation. Kiteto Agribusiness has acquired and successfully operates a sunflower seed crushing operation that can crush up to 130 bags of sunflower seeds a day. In addition Kiteto Agribusiness has three storage and warehouses with a total capacity of up to 20,000 bags. Kiteto Agribusiness runs their own sunflower farm of about 1,200 acres but is willing to buy additional seeds from about 3,000 small farmers. It is in this context that Kiteto Agribusiness wants to introduce contract farming with at least 1,000 farmers. Depending on the needs of the small farmers, Kiteto Agribusiness is willing and able to provide quality seeds, ploughing services, training in agronomic practices, and provision of extension services. In the past, Kiteto Agribusiness has also been a good partner in establishing collection centers for sorghum and chicken peas.

The partner of RLDC in pollination will be Honey Care (Tanzania) (HCT) who have also been our partner in the first phase. While the honey and bees wax business of HCT prospers and grows continuously, HCT intends to open up another line of business that is already huge in other countries (USA). HCT is also one of the few companies in the beekeeping sector which propagates modern beekeeping. HCT makes modern beehives and stocks other equipment items for modern beekeeping (i.e. honey extruder, beekeeping suits). Through the intervention, HCT aims at developing pollination as a service for agriculture. As the impact of pollination will be mainly tested, HCT will be responsible for the field operation of this intervention. The testing farms will be provided by another RLDC partner called Kibaya Farm located in Manyara region.

The partners of RLDC in the establishment of a refinery are investors that are willing to invest in the processing of oil. These investors can be members of CEZOSOPA but may also come from other quarters.

In the last intervention, RLDC intends to mainly work with members of CEZOSOPA and facilitate the improvement of the branding and marketing.

4.6 Risk Analysis

Given the current momentum of sunflower production and processing in the Central Corridor there are mainly two risks.

4.6.1 Unfavourable Government Intervention

Following the lobbying of palm oil importers and processors the import duty of 10% was initially waved and only after massive protests by farmers and processors who use local oil seeds, it was (at least partly) reinstated. There is however still a risk that palm oil importers and processors will try again to safeguard their high investments against an increasing consumption of local vegetable oils.

RLDC believes that it makes economic sense to increase production and processing of local vegetable oils, particularly sunflower oil. RLDC will therefore prepare relevant papers and participate in or even organize events where the promotion of production and processing of local vegetable oil is discussed.

4.6.2 Unfavourable Weather Conditions

Although sunflower grows even in the dry weather conditions of the Central Corridor, a drought is always looming during which production levels may drop substantially. RLDC will undertake further assessments to which extent small scale irrigation could mitigate against this risk.

4.7 Project Budget

The project is envisaged to cost a total of Tshs 503,450,000/=, where RLDC will contribute Tshs 348, 450,000/= and our partners will contribute a total of Tshs 155, 000,000/=. The following is the project budget breakdown (for detailed budget, refer to annex 1)

ITEM	COSTS	RLDC	PARTNER
Seeds production and marketing	220,000,000	150,000,000	70,000,000
Improvement of production and sales through contract farming	145,200,000	106,200,000	39,000,000
Pollination for increased yield	32,100,000	27,100,000	5,000,000
Business plan for refinery	37,450,000	28,350,000	8,500,000
Improvement of sunflower oil branding and marketing	69,300,000	36,800,000	32,500,000
Grand Total	503,450,000	348,450,000	155,000,000

ANNEXES

Annex 1: Project Budget

Item	Quantity	Price	Cost	RLDC	Partner
Seeds production and marketing					
<ul style="list-style-type: none"> • Identifying focus • Drafting guidelines • Advertizing • Assessing, selecting • Contracting • Monitoring 	1 3 - 5	150 Mio 50 Mio	2,000,000 150,000,000 220,000,000	2,000,000 150,000,000 150,000,000	70,000,000
Subtotal			222,000,000	152,000,000	70,000,000
Improvement of production and sales through contract farming					
<ul style="list-style-type: none"> • Assessment of needs <ul style="list-style-type: none"> → Service fees → Accommodation, subsistence → Transport • Contract formulation <ul style="list-style-type: none"> → Consultant fees → Flight, transport → Accommodation, subsistence → Other costs • Meetings for consensus, agreement, implementation <ul style="list-style-type: none"> → Transport → Venue, subsistence • Implementation support <ul style="list-style-type: none"> → Various measures • Model development <ul style="list-style-type: none"> → Monitoring → Report and Case Study 	20 days 20 days 20 days 20 days 1 flight 20 days Lumpsum 60 events 60 events 50 days 15 days	500,000 60,000 10,000 1,000,000 1,500,000 150,000 500,000 200,000 200,000 70,000,000 200,000 200,000	10,000,000 1,200,000 2,000,000 20,000,000 1,500,000 3,000,000 500,000 12,000,000 12,000,000 70,000,000 10,000,000 3,000,000	10,000,000 1,200,000 2,000,000 20,000,000 1,500,000 3,000,000 500,000 10,000,000 10,000,000 40,000,000 5,000,000 3,000,000	2,000,000 2,000,000 30,000,000 5,000,000
Subtotal			145,200,000	106,200,000	39,000,000
Pollination for increased yield					
<ul style="list-style-type: none"> • Initial site visit <ul style="list-style-type: none"> → Transport → Accommodation, subsistence • Leasing of beekeeping 	1500km 3 days	600 60,000	900,000 180,000	900,000 180,000	

equipment and colonized beehives for 1 month	lumpsum	5,000,000	5,000,000	4,000,000	1,000,000
→ Hire charges for equipment (list see annex)	40 hives 40 stands 3000km	50,000 5,000 4,000	2,000,000 200,000 12,000,000	2,000,000 200,000 11,000,000	1,000,000
→ Hire charges for beehives	2*8 days	100,000	1,600,000	1,600,000	
→ Stands	2*9 days	120,000	1,920,000	1,920,000	
→ Transport charges					
→ Installation / removal charges (2 persons)					
→ Installation / removal (2 persons)	30 days	30,000	900,000		900,000
→ accommodation, subsistence	30 days 4 days 10 days	20,000 200,000 300,000	600,000 800,000 3,000,000		600,000
• Operation and Monitoring					
→ Operation manpower	10 days	200,000	2,000,000	1,000,000	1,000,000
→ Accommodation, subsistence	lumpsum	1,000,000	1,000,000	500,000	500,000
→ Monitoring / final report					
→ Management fee					
• Service Development					
→ Case Study					
→ Promotion material					
Subtotal			32,100,000	27,100,000	5,000,000
Business plan for refinery					
• Awareness Workshop					
→ Consultant Fees	30 days	500,000	15,000,000	15,000,000	
→ Accommodation, subsistence	30 days	150,000	4,500,000	4,500,000	
→ Venue	Lumpsum	1,500,000	1,500,000	1,500,000	
• Visits, Participation					
→ Flights	5 flights	1,000,000	5,000,000	2,500,000	
→ Accommodation, subsistence	25 days	150,000	3,750,000	1,000,000	
→ Other costs	Lumpsum	500,000	500,000	250,000	
• Advisory Service					
→ Service Fees	20 days	300,000	6,000,000	3,000,000	
→ Accommodation, subsistence	20 days	60,000	1,200,000	600,000	
Subtotal			37,450,000	28,350,000	8,500,000
Improvement of sunflower oil branding and marketing					
• Marketing Training					
→ Service Fees	25 days	300,000	7,500,000	5,000,000	2,500,000
→ Accommodation, Subsistence	30 days	60,000	1,800,000	1,800,000	
• Implementation of	1	60 Mio	60,000,000	30,000,000	30,000,000

Fund					
Subtotal			69,300,000	36,800,000	32,500,000
Grand Total			503,452,000	348,452,000	155,000,000

Annex 2: Implementation Schedule

Annex 3: Causal Monitoring Model