

Sunflower Production and its Potential for Improving Income of Smallholder Producers in the Tanzania

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Abstract

Sunflower is one of the three most important oilseed crops grown in the central agricultural zone of Tanzania. Local demand for sunflower oil, which is cholesterol free, is increasing and its potential of improving income of smallholder producers is also rising. This study was conducted in Kongwa and Singida Rural Districts where a total of 60 respondents were involved. Data were collected through Focus Group Discussions (FDGs) and direct interviews using semi-structured questionnaire. Statistical Package for the Social Sciences software (SPSS V20) was used for data analysis. Results show that sunflower production improved the income of smallholders' income in the study areas. Furthermore, it was found that there is not yet a formal contract farming system developed in the Singida rural district. Nevertheless, some informal kinds of arrangements whereby smallholder farmers accept some money from traders in exchange for sunflower selling to the same trader during harvests was observed, although still immature. Generally, the study has shown that sunflower production in the area has potential for improving the income of smallholder producers in the Central Agricultural Zone of Tanzania and hence its promotion is recommended. In addition, given the increasing prevalence of contractual arrangements in production and marketing of sunflower, it is proposed that there is a need for further research on the effects of contract farming on sunflower farmers' production and income.

Keywords

Sunflowers production, Income, Smallholder producers, Tanzania

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1. Introduction

Sunflowers in Tanzania has historically only been a traditional crop without any significant commercial value. Recently, however, sunflower as an oilseed crop is becoming important because of its growing monetary value associated with its relatively low cost of production. Local demand for sunflower oil, which is cholesterol free is increasing and its potential of becoming a major agricultural commodity for export is also rising, (RLDC, 2008; ARI Ilonga, 2008). Government documents (URT, 2015; ARI Ilonga, 2008) show that the total amount produced has steadily increased, from an average of 80,000 tons per year in 2000/2001 to about 2,625,000 tons per year by 2015/2016 as presented in the annual national budget speech (URT). According to URT, vegetable oil consumption in Tanzania is estimated at 350,000 tonnes in 2016, of which 40%, (140,000 tonnes) is supplied from sunflowers. Increase in sunflower production is said to be accelerated by the introduction of relatively inexpensive oil expellers and filtering machines from China, in addition to extension work provided by government offices, NGOs such as Rural Livelihood Development Company (RLDC), the Netherland Development Agency (SNV, 2012), and the private sector, for the cultivation and quality seed introduction (JICA, 2014).

Worldwide, about 87% of the world sunflower crop is produced in Russia, Ukraine, Argentina, European Union, India, China, and the USA. Others of some significance are Romania, Bulgaria, South Africa, Turkey, and Canada. Only 13% is produced by the rest of the world (FAO, 2014). Traditional large markets for edible oil are in Europe, the Middle East, and the USA. Worldwide, the demand for edible seed oils is increasingly exceeding supply, and new market opportunities are developing. China and India are the major emerging markets in addition to the existing global markets (KPMG, 2011).

Sunflower is a hardy crop that requires little fertilizer. It grows in well-drained loam soils and is tolerant to low rainfall and suited to regions with moderate rainfall (FAO, 2014). In Tanzania sunflower grows well in many parts of the country and, as such, tends to be widely dispersed across a range of localities. A significant amount of sunflower however, is produced in the Central Agricultural Zone of Tanzania, comprising the three administrative regions of Singida, Dodoma, and Manyara, (Table 1). The Singida region remains the most productive region and leads in total annual volume produced with an average annual growth of 32% for the 2006/07 agricultural season to 2010/2011 season.

Under the *Kilimo Kwanza* initiative (TNBC, 2009), Singida has given the crop a priority and sunflower has become a leading cash crop in the region. The regional administrative authority has promoted wide involvement of private sector actors. Private companies interested in the development of the crop include private sunflower oil processing firms and facilitating companies like RLDC, and are valued and accorded support for their activities. As a result, there is an increase in overall production in the region.

Producers are mainly smallholder farmers owning small farms with sizes ranging from one to three-and-a-half acres. Sunflower production is generally fragmented, involving more than 350,000 smallholder producers nationwide (RLDC, 2008). Most sunflower farmers are independent producers who sell their products individually and have little bargaining power over buyers and product markets due to a lack of strong formal organization. Sunflower producers lack access to quality and reliable extension services and face limited availability and access to inputs (e.g. higher-yielding seed and tilling machines) often due to financial constraints. Smallholders have limited access to financing that would enable them to invest in production assets. Private sector role in the sunflower sub-sector is still marginal. Smallholders are not an attractive market because of their fragmentation and resulting high costs of distribution that increase retail prices of inputs and financial services (RLDC, 2008).

2. Objectives of the study

This study is intended to assess the potential of sunflower production in enhancing incomes of smallholder farmers by examining the scale of production and profitability of the sunflower production business in the Central Agricultural Zone of Tanzania by examining the districts of Kongwa and Singida Rural. One of the specific objectives included the investigation of sunflower production and its potential for improving income of smallholder producers in the study area. This objective was the core for this paper.

3. Methods and materials

The study intended to establish factors, actors, channels and dynamics in the sunflower sub sector in the study area of Kongwa District (two villages of Suguta and Ihanda with 30 respondents) and one village in Singida Rural District (Mpipiti village with 30 respondents). Selection of these villages was based on the record that these villages have undergone different experiences where production and marketing is organized along arrangements which are similar to known contract farming arrangements (RLDC, 2008). It is argued and held in literature that one of the approaches that has potential of dealing with many of the challenges facing smallholder farmers in production and marketing processes in a liberalized economy is Contract Farming (Eaton & Shepherd, 2001).

Data for this study were collected in the agricultural season of 2011/12 through questionnaires that were distributed to randomly selected sunflower farmers in Kongwa and Singida rural districts. Direct interviews using semi-structured questionnaires were also conducted with selected key resource persons, including District Agricultural and Livestock Officers in Kongwa and Singida rural Districts, the manager at Mtinko government farm in Mtinko village, in Singida rural District, and the manager of Mount Meru Millers (MMM) Ltd. in Singida. In addition,

Focus Group Discussions (FGDs) were also held in all villages visited to supplement information. Through these discussions, a follow-up was made on critical issues related to factors in production and the marketing and value additions.

4. Results and Discussion

4.1 Production issues in Singida Rural District, Mpipiti Village

(a) Production Issues

It was revealed that sunflower is one of the top three crops grown in Singida rural district in terms of monetary value, the other two cash crops are cotton and onions. Sunflower is grown on small holdings; about 90 percent of all farmers in the district grow the crop. Farmers own on average between 1 and 3.5 acres, while yield per acre ranges between 8-10 bags, each with 65 kilograms (URT, 2015). Its contribution to household income ranges between 10 percent and 25 percent, equivalent to an amount of money ranging between TZS 250,000 (or USD 109) and TZS 500,000 (or USD 217.4) per year. Sunflower fetched a higher price of TZS 830 per kilogram in the period covered by this study (2011/12), compared to TZS 350 per kilogram offered in the previous agricultural season of 2010/2011. The higher price was attracting more investment in the sunflower sub-sector as indicated by the increasing number of sunflower producers, increasing acreages allocated for sunflower production, and the resulting increased annual output as indicated in Table 2.

Table1. Sunflower production in Singida district in thousands of tons

2006/7	2007/8	2008/9	2009/10	2010/11
28.111	30.205	58.922	47.358	83.1

Source: Singida regional agricultural statistics July, 2012

There has also been an increase in sunflower processing plants. There were about 17 small processing plants in addition to the large refinery plant established by Mount Meru Millers, the Arusha based private company dealing with processing of sunflower seeds and sunflower cakes. This company is finalizing establishment of a second plant that will do double refining. The company produces for both local and external markets.

(b) Marketing System of the Crop

The existing system and pattern of marketing has two methods. One entails farmers selling their produce through their primary cooperative societies. Farmers sell to their cooperatives at the initial agreed price (first price) and produce is stored to wait for a better price in the market. Upon selling later at the higher price, the cooperatives are obliged to make second

payments to the farmers from the differences in revenue resulting from increased price. There are seven cooperative societies financed by CRDB and NMB banks, which have capacity to buy all sunflower produced in the district. Buyers of produce of the cooperatives are individual traders and companies within Singida and traders from other regions like Arusha, Mwanza, Dar es Salaam, and Nairobi in Kenya. The other marketing system entails free buying from individual farmers by private buyers including the MMM Ltd. The coming of this company has strengthened market competition for sunflower production. As a result, the price has tended to rise continuously. In this season, for example, it has risen from TZS 410 per kilogram at the beginning of season (June) to TZS 830 per kilogram by the end of July 2012. The general manager of MMM Ltd. expresses concern that the supply of the crop might not meet the actual demand. MMM Ltd. has invested a lot in processing machines and he is afraid there might not be enough produce to keep his machines running long enough to realize any profit.

Seed cakes have a ready market within the area as it is widely used as livestock feed by pig keepers. Each bag of raw sunflower produces about 5 kilograms of seed cake and each kilogram fetches at least TZS 280. Seed cake is also bought by MMM Ltd. and some traders from Kenya who are said to have technology to carry out solvent extraction using high-tech machines. Using this equipment, it is reported that an additional five liters are obtained from the cake per bag of raw sunflower processed. This puts total extraction of oil at an average of 25-27 liters per bag of sunflower, which is higher than the usual average amount of oil experienced by local processors at between 20-22 liters per bag.

(c) Contract Farming

There is no formal contract farming system in the Singida rural district. Field findings however, indicate a few informal kinds of arrangements whereby some smallholder farmers accept some money from traders in exchange for pre-harvest sunflower, which is a still immature sunflower on the farm. The practical problems associated with this approach have been that some farmers refuse to deliver their produce when time for paying back comes, but instead do side-selling. The reason is that the mature sunflower has more value, and commands a higher price and increased revenue than what they received earlier. This has resulted in serious conflicts between farmers and traders, as found in Mpipiti village. Against this experience, the possibility of contract farming being formalised into popular method of organising production and marketing looks uncertain.

Table 2. Profitability sensitivity analysis at farm level in Mpipiti village

	Scenario1	Scenario2	Scenario3	Scenario4	Scenario5	Scenario6	Scenario7
No of bags	12	49	35	105	6	90	50
Price per bag	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Total revenue	600,000	2,450,000	1,750,000	5,250,000	300,000	4,500,000	2,500,000
Total cost	398,000	724,500	517,500	1,525,500	199,000	2,985,000	1,015,000
Profit	211,000	1,725,500	1,232,500	3,724,500	101,000	1,515,000	1,485,000

NB: USD 1= TZS 2,345 as of July, 2018

Source: Singida regional agricultural statistics July, 2012

The analysis shows that in Singida sunflower is a lucrative commodity for farmers, a farmer in Mpipiti village can make a minimum profit of TZS 101,000 or maximum profit of TZS 3,724,000 per season, with price and yield-per-acre determining the size of the profit. Farmers can sell their entire crop, and good price and high revenues accrue from sunflower crop. Rainfall is the major factor influencing the size of output. This picture suggests that there are no losses associated with sunflower production in the village and the district at large.

4.2 Production issues in Kongwa District

(a) Production Issues in Suguta Village

Sunflowers have been grown commercially in Kongwa district since 1999. By the year 2011/12 the crop was considered a very important cash earning crop in both villages of Suguta and Ihanda.

Suguta is the one village studied in Iduo ward. The village has 540 households with 3540 people. About 90% of the people cultivate a sunflower crop. Production of sunflower has been expanding since 1999. Many farmers have specialized farms for sunflower and, unlike in the past, farmers no longer intercrop. The reason given is that they have more confidence in the crop now than before.

The minimum farm size owned by a household is two acres; usually the size ranges from 2-20 acres. Reasons for the increased production per household as explained by farmers include:

(a) Presence of local market for sunflower products. Many people in the village like and use sunflower oil in their daily cooking, instead of traditional cooking oil extracted from groundnuts. Besides, many people are increasingly making chewing raw sunflower seed their habit. This is an added market, in the past it was roast ground nuts that were usually chewed;

(b) Expanded external market. The number of processing/crushing machines has increased in the area. Suguta village has one privately owned seed crushing mill, but there are many more mills (3) in the neighborhood in Mlali about four kilometers and more than 10 mills in Kibaigwa, about 25 kms away. Kibaigwa and Mlali are urbanized rural centers with significant concentrations of people and businesses. Farmers sell their produce to processors and traders or middlemen in these centers. The market has also expanded by attracting traders from as far as Zanzibar, Dar es Salaam, and Mbeya who collect both raw sunflower seeds in bags and filtered sunflower oil; and

(c) Increasing demand for sunflower seed cakes. There are many people keeping pigs, these provide market for seed cakes, farmers gain income from oil and the by-product, the seed cakes.

(b) Productivity

Farmers employ family labor; farm implements used include hand hoes, animals, and tractors for tilling the land. Animals (in ox-driven plows) are the common means of tilling the land. Few farmers use animal manure in their farms. The minimum farm size owned by a household is 2 acres, usually the size ranges from 2-20 acres. Farm preparation is usually done in January and the harvest in June. One acre produces between 4 and 5 bags of 60 kilograms each, while in bad years only 2 to 3 bags are harvested per acre. One bag of 60 kgs produces 20-22 liters of filtered oil and 5 kgs of seed cake.

(c) Contract farming in Suguta Village

Some elements of contract farming were observed in the area. The initiator was one processor, Uncle Milo Sunflower Trading Company, based in Dodoma town who organized a seminar for the villagers in November 2010. The company presented and discussed a contract farming scheme for sunflower crops in the area. The meeting was well attended and each participant was facilitated by token payment of TZS 2000. The information that came out of the seminar inspired the villagers, and many registered to join the scheme. The scheme started with 40 smallholder farmers

Terms of contracts

The contractor promised to support farmers in production of sunflower:

(a) He would facilitate timely availability of improved seeds to farmers at a cost; and (b) he would provide anything farmers needed on condition that payments would be made later in terms of sunflower produce. Items included bicycles, mattresses, motorcycles, plows, and power tillers. Farmers on the other hand would be obliged to sell their sunflower produce to the company at the going market price after harvest.

However, in the field we observed the following concerning contracts:

(i) Contractual arrangements seemed to be a new idea in the area. (ii) Contracts seemed to be one-sided; they were designed and submitted to farmers by the buyers or traders. (iii) Farmers only read and accepted or rejected the conditions. (iv) Contracts were short term, seasonal, and informal and the contract was not formally known by the District Authority nor formalized by any lawyer. (v) The Local Government Authority at the district level was not explicitly involved. (vi) There were no known ways of enforcing such contract agreements and arrangements, especially in time of defaults between farmers and contractors. (vii) They were open contracts where prices were left to be determined by the market after harvest.

Table 3: Profitability sensitivity analysis at farm level in Suguta village

	Scenario1	Scenario2	Scenario3	Scenario4	Scenario5	Scenario6	Scenario7
No of bags	9	15	20	6	8	15	6
Price/bag in TZS	42,000	42,000	42,000	42,000	42,000	42,000	42,000
Total revenue	370,000	630,000	840,000	252,000	336,000	630,000	252,000
Total cost	171,000	285,000	290,000	168,000	224,000	177,000	168,000
Profit	191,000	345,000	550,000	84,000	112,000	453,000	84,000

Source: Dodoma Region Agricultural Statistics, 2012

The analysis shows that a farmer in *Suguta* village can make a minimum profit of TZS 84,000 or maximum profit of TZS 550,000, with price and yield per acre determining the size of the profit, and rainfall being the major determinant of yield. This picture suggests that there are no losses associated with sunflower production in the village.

(d) Production issues in Ihanda Village

Ihanda is another village in which the sunflower crop is widely grown. About 90% of people in the village cultivate the crop. It is the second most important crop after maize and contributes up to about 50% of the income of most of the households in the village. Each household owns at least two acres of sunflower with a few individuals owning up to 20 acres. There is increasing market for sunflower products that includes traders and processors from Mlali, Kibagwa, and other places like Dodoma, Dar es Salaam, and Zanzibar.

(e) Contract Farming

Two companies, RLDC and RIG Investment, are working in the village as contractors. There are 280 farmers in contracts in four groups of 70 members each. Farmers were inspired by the contractors through seminars which began in 2008. During the first seminar, the two contractors, operating jointly, presented to the farmers the contract farming system. RLDC was to form the farmer groups and RIG Investment was to buy all the sunflower crop produced. The contractors promised to: (a) establish a sunflower marketing center in the village; (b) facilitate formation of farmer groups; (c) buy all sunflowers produced at the going market price; (d) facilitate and finance farmers' field classes; (e) extend appropriate knowledge through seminars on sunflower and contract farming; (f) provide credit of 5% of that the farmer would need, such as tilling of land, fertilizers; and (g) provide production inputs such as improved seeds.

Farmers, on the other hand, would be required to produce more sunflower oil seeds and sell to RIG Investment. They would also be required to keep all other agreements. A warehouse with a capacity of storing 1000 bags a time was constructed in the village for selling and buying of sunflower. Farmers received seminars three times a year on improved methods of sunflower production, and about four villagers received detailed training to become trainers in the village. These coach farmers distributed improved seeds from contractors and collected back the seeds after harvest. Two demonstration farms were established and maintained continuously in the village except for year 2011, when the farms remained idle because contractors did not provide funds to run the one-acre farm. The farmers usually paid for the land rent, seeds, and manure, which is usually the cow dung available in the village, and its transport cost for the animal carts (mkokoteni). The demonstration farm produced between 7-10 bags compared to 3-4 bags per local acre produced by individual farmers. Farmers were supplied with the improved sunflowers seeds '*record*,' although not to the satisfaction of every farmer. There were complaints over high price charged for the seed supplied. Each kilogram cost TZS 2000, but the local variety cost just TZS 500. Credits limited to 5 percent were rejected by many farmers as being inadequate and a nuisance, as they could not help them afford costs of many inputs, for example hiring a tractor.

Like the experience in Suguta village, in Ihanda village observations included contractual arrangements being a new idea in the area, and contracts seem to be one-sided. They were designed and submitted to farmers by RLDC and RIG Investment, with farmers just being takers of the contracts. They only read and accepted or rejected the conditions on an individual basis. Contracts were short term or seasonal and informal and were not known by the District Authority. The companies had been working with the government extension officer. There were no known ways of enforcing agreements, especially in time of default between farmers and

contractors, and there was no contract price. Price is left to be determined by the market after harvest.

Contractual arrangements influenced a price rise, with the price increasing from TZS 25,000 per bag in the preceding season to TZS 450,000 in the season covered by the study, while in the neighboring center of Kibaigwa, a bag fetched up to TZS 50,000. Prospects were that by the end of the year 2012, the price increased to 60,000 and above per bag of 65 kilograms. There seems to be little trust between contractors and farmers, contractors are willing to extend credit to a very low level to avoid risk if farmers default the contracts.

Table 4: Profitability sensitivity analysis at farm level in Ihanda village

	Scenario1	Scenario2	Scenario3	Scenario4	Scenario5	Scenario6	Scenario7
No of bags	8	9	4	12	9	6	6
Price per bag	44,000	44,000	44,000	44,000	44,000	44,000	44,000
Total revenue	352,000	396,000	176,000	528,000	396,000	264,000	264,000
Total cost	168,000	252,000	166,000	174,000	252,000	168,000	168,000
Profit	184,000	144,000	10,000	354,000	144,000	96,000	96,000

NB: Scenario means different farmers interviewed

Source: Dodoma Region Agricultural Statistics, 2012

The analysis above shows that a farmer in *Ihanda* village can make a minimum profit of TZS 10,000 or maximum profit of TZS 354,000, with price and yield per acre determining the size of the profit and rainfall being the major determinant of yield. This result suggests that there are no losses associated with sunflower production in the village.

Conclusion and Implications

One of the potential outlets for sunflower seeds is the growing sunflower oil market. The increase in sunflower use as cooking oil has expanded moderately in the study area due to increasing interest by many consumers of organic products including sunflower oil which is grown free of harmful chemicals. Sunflower oil is used in cooking food, in bread making, and in wide range of food products made by street food vendors such as *mandazi*, *chapati* and soup.

Most sunflower processing firms are small-scale factories in towns and in urbanised rural centres such as Kibaigwa. The MMM Ltd facility recently established in Singida Town is the only large and modern factory in the area. Few processing firms or seed crushing facilities are set up in rural areas of the sunflower growing districts.

One major constraint facing the sunflower processing industry is the limited availability of a regular supply of sunflower seeds for processing. In many areas seed crushing industries

actively operate for not more than four months after harvest. In processors' views, the high instability of raw material supplies makes maintenance of sustained production of oil difficult.

On the other hand, it shows that there is a huge, unsatisfied market for sunflower produce, therefore an opportunity for sunflower farmers in the area. Farmers should be encouraged to go into production of this crop, which has the potential of increasing their incomes.

Given the increasing prevalence of contractual arrangements in production and marketing of sunflower, it is proposed that there is a need for further research on the effects of contract farming on sunflower farmers' production and income.

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