Socio-economic constraints to sunflower production in Bojanala farming community of the North-West province, South Africa

Lekunze J, Antwi, M.A and Oladele O.I.

Department of Agricultural Economics and Extension, North –West University Mafikeng Campus**.** South Africa
oladimeji.oladele@nwu.ac.za

Abstract: This paper examined the socio-economic constraints to sunflower production in Bojanala farming community of the North-West province, South Africa. Simple Random sampling was carried out to select 150 farmers from a list of 257 farmers. Primary data based on 2006/2007 and 2007/2008 growing seasons were obtain by use of the questionnaires. Data were collected on socio-economic, output levels, inputs costs measured in rand; and key role players and analyze with SPPS using percentages and double log function of the linear multiple regression. Results of the analysis show that, very few young people below 30 years of age are engage in sunflower production in the Bojanala Region. On gender, 69.5% of all the sunflower producers were male, 51% of the farmers had household size of 4 to 6 children, while 59.8% were married, and 58.5% were with less than three dependants. Farmers with educational levels from standard 8 to 10 constitute 34.10%. Also, 59.7% had 1.1-1.5 tons as output per hectare. Sunflower farmers who had access to the extension services constitute 70.7%. Significant determinant of the socio-economic constraints include number of plantings per year, storage costs, price, income, access to market and farm size.

[Lekunze J, Antwi, M.A and Oladele O.I. **Socio-economic constraints to sunflower production in Bojanala farming community of the North-West province, South Africa.** Life Science Journal. 2011;8(2):502-506] (ISSN:1097-8135). http://www.lifesciencesite.com.

Keywords: socio-economic characteristics, sunflower, South Africa, output, extension contact

1. Introduction

Despite its relatively small share of the total GDP, primary agriculture is an important sector in the South African economy. It remains a significant provider of employment, especially in the rural areas, and a major earner of foreign exchange (NDA 2007). The value of commercial agricultural production in South Africa was R78 billion in 2006, while its contribution to GDP was approximately R35 billion. The primary agricultural sector has grown by an average of approximately 11,8 % per annum since 1970, while the economy as a whole has grown by 14,9 % per annum over the same period, resulting in a decline of agriculture's share of the GDP from 7,1 % in 1965 to 2,3 % in 2006 (NDA 2007). Agriculture's strong indirect role in the economy is a function of backward and forward linkages to other sectors. Purchases of goods such as fertilisers, chemicals and implements form backward linkages with the manufacturing sector, while forward linkages are established through the supply of raw materials to the manufacturing industry. About 68 % of agricultural output is used as intermediate products in the sector. Agriculture is therefore a crucial sector and an important engine of growth for the rest of the economy (NDA 2007). In the North-West province, agriculture remains a major source of income for the livelihood of approximately 65% of the rural population (North-West Department of Agriculture, Conservation and Environment, 2005). Sunflower is the second most important agricultural field crops produced in the North-West province after maize.

It is an important agricultural contributor to the provincial economic development of the North-West province. In addition, sunflower contributes to the household food security of farmers and its production is often affected among other factors by output levels and market prices of the commodity. Sunflower is marketed in the form of refined oil for domestic and industrial cooking, baking and animal feed. According to the National Department of Agriculture (2004), sunflower variety whose seed contain high oil content is the most important source of oil for human consumption in South Africa as compared to other oil seed crops. However, sunflower production is a complex and demanding business with numerous pressures in terms of socio-economic and financial factors, weather, and technological advancement. A prime concern in crop cultivation has always been water availability which limits yield potential in dry land agriculture of semiarid region such as the North-West province. Sunflower is an annual crop, highly drought tolerant and commonly grown as a dry land crop that produces satisfactory results when other crops are damaged seriously. This drought tolerant nature of sunflower is attributed to its deep rooted nature that enables it to increase the effective use of stored soil

water as oppose to other dry land crops. This drought tolerance makes it a better alternative to other dry land crops produced in the province which are more susceptible to drought. The current increase in the demand for alternative energy such as bio-fuel has resulted to a sharp increase in the prices of sunflower oilseeds. Emerging and medium scale sunflower producers in the North-West province provide a great window of opportunities for job creation in this sector. The price per ton of sunflower has dramatically increased from approximately R1800, 00 per ton in 2005 to over R4500, 00 per ton based on forward contracts in 2008.This act as an incentive for emerging sunflower growers to expand production and increase output levels. However, sunflower production and output levels has not grown as fast as its demand. What can be the reason for the slow expansion in production and slow increase in output levels of sunflower in the North-West province?

Costs of sunflower production and the risk of production with respect to drought in North-West province and South Africa in general is still relatively high as compared to their sunflower producers who are subsidized in Europe, America and Argentina. This result to unfair trade competition and drastically reduced the profit margin obtain by South African sunflower growers. Based on the current market price per ton of sunflower, the profit margin that can be obtained from sunflower production is higher relative to other dry land crops. Though the production of sunflower has been increasing over the years, its demand is rising than its production due to higher home and international market demand. According to SAGIS (2006), the importation of sunflower products into South Africa has risen from zero tonnage in 1999/2000 to a total of 34700 million tons in 2004/2005 and was expected to reach 60000 million tons by May 2006 within this six year period. Therefore addressing socio-economic constraints that prevents sunflower production in the North-West Province of South Africa can help reduce the production deficit in the country. Because of the importance of sunflower in terms of its uses and income generating potential, there is therefore a need to look into the reasons why its expansion in production in spite of land availability, technological advancement, infrastructural availability, market liberalization is slower than the demand for the product.

This study is concerned with sunflower production in the Bojanala farming community of the North-West province, especially those emerging farmers involved with commercial production of sunflower. It will assist in the identification of socio-economic constraints faced by sunflower farmers in the study area. Findings would provide information to policy makers on ways to assist sunflower producers increase production in the study area. The challenge for this study is to identify socio-economic factors which are preventing sunflower producers in Bojanala Region from meeting the surge in demand despite the excess milling capacity that exist and the encouraging price per ton at the market. Again, it will also help policy-makers, government and sunflower producers associations to design appropriate policy measures and programmes with the view of uplifting and improving the competitiveness of the sunflower production sector in South Africa. Despite the fact that the production level of sunflower in South Africa is increasing, the rate of increase is far lagging behind the rate of demand for its products. South Africa has the potential (in the form of land availability and technology) to take advantage of this surge in demand. However, producers of sunflower have not been able to take this advantage. The objective of the study is to identify and critically analyze the limiting socio-economic factors faced by sunflower producers in the Bojanala farming community of the North-West province.

2. Materials and Methods

The Bojanala Region is found in the North Eastern part of the North-West province. This region is made up of five local municipalities, namely, Madibeng, Moretele, Moses Kotane, Kgetleng River and Rustenburg. The area lies between 25 and 28 degrees longitude East of the Greenwich Meridian and between 27 and 30 degrees latitudes south of the Equator (Mabe, 2005). The region is bordered in north by the Northern Province and in the east by Gauteng province. In the west it is bordered by the Central Region and to the south by the Southern Region of which all are parts of the North-West province. A list of small scale emerging sunflower producers was obtained from the Extension Officer in the study area. Simple Random sampling was carried out to select 150 farmers from a list of 257 farmers. Primary data based on 2006/2007 and 2007/2008 growing seasons were obtain by use of the questionnaires. Data were collected on socio-economic, output levels, inputs costs measured in rand; and key role players and analyze with SPPS using percentages and double log function of the linear multiple regression.

$$\ln Y = \log A + a_1 \ln CS + a_2 SF + a_{3\ln} EPL + a_4 \ln MC + a_5 \ln TI + a_6 \ln SC + a_7 \ln LS + a_8 \ln MP + a_{10} \ln EXT + a_{11} \ln ACCM + a_{12} \ln CRED + e$$

Where:

Ln = Natural log

Y = Output of sunflower in tones per hectare
A = Constant which is the minimum output
a_i = Estimates of the elasticities or regression coefficients
CS = Costs of sunflower seeds.
SF = Sex of farmers
EPL = Employment
MC = Machinery costs per hectare
TI = Total income per year
SC = Storage costs of output
LS = Land size under sunflower production
MP = Market selling price/ton of sunflower
EXT = Use of extension services
ACCM = Access to market
CRED = Access to credit
E = Error term

3. Results

The results on the socio-economic characteristics of emerging sunflower farmers covers their personal characteristics while Table 1 presents the regression estimates of effects of significant variables on sunflower output per hectare.

3.1 Socio-economic characteristics of emerging sunflower farmers

Results of the analysis show that, farmers who were less than 30 years of age and above 70 years constitute 9.8% and 6.1% respectively. The result is an indication that, very few young people below 30 years of age are engage in sunflower production in the Bojanala Region. On gender, 69.5% of all the sunflower producers were male while 30.5% were female farmers indicating a male dominated . About 51% of the farmers had household size of 4 to 6 children, while 59.8% were married, 58.5% were with less than three dependants. Farmers with educational levels from standard 8 to 10 constitute 34.10%. Farmers with educational levels from standard 1 to 7 constitute 26.8%. In terms of land ownership 91.5% do not own the land on which they farm while 8.5% agreed that they own the land on which they farm. Also, 59.7% had 1.1-1.5 tons as output per hectare. Sunflower farmers who had access to the extension services constitute 70.7% while farmers had no access to extension services constitute 20.7%. Results on visitations by extension workers indicates that, 70.7% of farmers have visits from extension officers while only 20.7% of farmers said they have never been visited by extension personnel. This analysis shows the extent to which the extension workers are assisting the farmers in order to improve on agriculture in this region.

3.2 Socio-economic constraints to sunflower production among emerging sunflower farmers

From the results of the regression analysis in Table 1, the factors which did not yield statistically significant coefficients **we**re; age of farmer, household sizes of farmers, number of dependents by farmer, land tenure, farming a full time job, total cost of planting seeds and seeds dressing, cost of machinery per year, distance of market from production area, total marketing expenditure for sunflower per year, access to credit and whether access to credit is a constraint to sunflower production. The results show that the gender of farmers affects sunflower output positively and significant (**p**=0.076) as most of the sunflower producers were male. This may be attributed to the fact that, males have more time to spend on their farms than females who are mostly engage in household activities and spend limited time on their fields. Males contribute directly in terms of labour and supervise workers and have strong bargaining power than women when it comes to loan negotiations and buying of inputs. A positive and significant (p=0.057) relationship between the number of planting times and output per ton. It must be mentioned that sunflower is an annual crop that is produce once a year however, number of planting times refers to the differences in time as the farmers do their planting. Total storage costs is positively significant (p=0.001). According to the results in Table 1, an increase in output per hectare will result in 0.345 increases in the cost of storage all other factors remaining constant. Positive relationship exists between output per hectare and cost of storage, which implies as output increases, cost of storage also increases. Similar positive results were found by Odulaja, and Kiros, (1996.

The results of the regression in Table 4.8 indicates that current price per ton of sunflower is statistically significant at (P = 0.000), signaling an increase of 0.968 in output per hectare when price per ton increases by one unit. Hence the relationship between current price per tone and output per hectare is positive. Total income per year is negative and statistically significant (P=0.003), signaling an increase in output per hectare. The results also shows that, a unit change in output per hectare will result in -0.649 reductions in farmer's income. This is attributed to the fact that despite the unprecedented increase in price per ton of sunflower oilseeds, inputs prices such as fuel cost, machinery cost, storage costs have been rising at faster rate than the increase in price per ton of sunflower. Extension contact has positive and significant (p=0.088) effects on output of sunflower per hectare. Improvements in extension

contacts and services will results in a 0.202 increase in sunflower output per hectare. Thirtle *et al* (1998) tested induced innovation hypothesis based on data from South Africa commercial farms. The result was positive with respect to farm size, research and extension including policies variables which are similar to the result obtain from the study. The results of the regression analysis is significant at (p=0.041) indicating a negative relationship between market accessibility and output per hectare. Reduction in market access will result to -1.145 in sunflower output. The reason is that the existing market systems do not allow farmers to explore outside of the systems there by leading to unfair transactions between the farmers and buyers. A positive and highly significant (p=0.006) relationship between output per hectare and land size under sunflower production. The result shows that an increase in the number of hectares cultivated will result to 0.343 increases in output per hectare all the other factors remain constant. The main reason is that, as the farm size of the farmer increases, the amount of grants receives also increases.

Table 1: Regression estimates of effects of significant variables on sunflower output per hectare.

	Beta	t	p
(Constant)		-.450	.654
Farmers' gender	.164	1.807	.076**
Employed	.333	3.267	.002***
Planting times per year	.190	1.944	.057**
Storage costs per year	.345	3.404	.001***
Price per ton of sunflower	.968	4.528	.000***
Income per year	-.649	-3.064	.003***
Access to extension services	.202	1.737	.088**
Access to the market	-1.145	-2.088	.041***
Land size cultivated	.343	2.833	.006***
Adjusted R^2		0.610	
F-Statistic		6.131	
Durbin-Watson		1.661	
Significant.		0.000[a]	

4. Conclusion

The study has shown that socio-economic factors affect sunflower production in the Bojanala Region of the North-West province of South Africa. Van Zyl (1995) concluded that large scale mechanization farms are generally inefficient with respect to food security when compared to small-scale family type's farm models. There are real economies of scale in larger farms but they are mostly false because they are as a result of policies that favor larger farms over smaller ones. However, it could be said that sunflower producers would generally be capable of making rational decisions if their numerous constraints are removed through effective and efficient government policies and farmer support programmes. It was evident from the results that socio-economic factors such inadequate finance, high interest rate, machinery costs, land tenure, changes in climatic, technical practices/tillage systems including lack of insurance affects sunflower producer addressing the initial research question and objective of the study. Further analysis using linear regression on selling price per ton, total income from sales of sunflower per year, access to market, Land size under sunflower production, total storage cost per year and access to market positively or negatively impacts on sunflower output thereby addresses the following hypothesis; selling price per ton affects sunflower output., total income from sales of sunflower per year affects sunflower output, access to market affects sunflower output.

Corresponding Author:
O.I Oladele
Department of Agricultural Economics and Extesnion
North West University – Mafikeng Campus
Private BagX2046, Mmabatho, South Africa
E-mail: oladimeji.oladele.nwu.ac.za

References

5. Mabe, L.K (2005). The Role of Women in Agriculture and other non-farm activities in three regions of the North-West Province. M.Sc.

Thesis 2005, North-West University, Mafikeng Campus
6. North-West Department of Agriculture, Conservation and Environment (NWDACE), Annual Report 2004/2005
7. National Agricultural Directory. National Department of Agriculture South Africa, Report 2004/2005.
8. National Department of Agriculture, (2001/2002): Analysis of Selected Food Value Chain in South Africa. Part 4, Chapter 6. www.nda.agric.za/fpme/vol14_chapter 6
9. National Department of Agriculture, Trends in Agricultural Production. Annual Report 2007
10. National Department of Agriculture, (2006/2007). Economic Review of the South African Agriculture. Annual Report 2007.
11. National Department of Agriculture, (2006); Quarterly Agricultural Economics Sector Review (April to June 2006). www.nda.agric.za.
12. National Department of Agriculture, (2006); Quarterly Agricultural Economics Sector Review (July to September 2006). www.nda.agric.za.
13. Odulaja, A and Kiros, F.G. (1996): Modeling agricultural production on small-scale farmers in Sub-Saharan Africa: A case study in Western Kenya. *Agricultural Economics* 14, pg 85-91.
14. Thirtle, T, Townsend, T.R. and Van Zyl, J. (1998): Testing the induced innovation hypothesis: An error correction model of South African Agriculture: *Agricultural Economics 19: pg 145-157*
15. Van Zyl, (1995). The Relationship between Farm Size and Efficiency in South African Agriculture: *Policy Research Working Paper No. 1548, World Bank.*

4/7/2011