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Full Length Research Paper

Socioeconomic Impact Assessment of Soybean Production on Farmers Welfare in Lichinga District, Northern Mozambique

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In recent years, soybean production has been promoted in Niassa province in order to help farmers increase their income. Hence, this study aims to assess the impact of the soybean production on the farmer's welfare in Lichinga district. Data were collected in through interviews among soybeans farmer and field observations. After data collection farmers were categorized into very poor, poor, and moderate according to their goods ownership. R program was used to perform descriptive statistics and regression analysis. The results shows predominance of young farmers living in poor families. Families who produce livestock in addition to soybean production have an average income of 556.17 USD/month. The production of crops for subsistence (Maize and Beans) has no significant effect on household income.

Keywords: Cash crops; profit; welfare; rural Mozambique; soybeans

INTRODUCTION

In Mozambique, as in many others developing countries, political discourses states that commercial agriculture can reduce rural poverty by increasing family incomes, and creating employment to the rural natives householders (Carrilho et al., 2003; MINAG, 2011; OECD/FAO, 2016). Although there are claims on the positive impact of cash crops, which are related to alleviation of rural poverty (Fantu Cheru and Modi, 2013), there are still many doubts among civil society organizations about the veracity of these allegations. Hence, it becomes necessary to conduct research in order to assess the level of production efficiency and analyse the impact of cash crops production on farmer's welfare.

Soybean is one of the cash crops that Mozambique has tended to invest in the last few years. This is a significant cash crop produced in all

over the world. United States of America, Brazil, Argentina and China are the world leaders in its production (Masuda and Goldsmith, 2009). The first soybean production in Mozambique was reported in the 1980s at Lioma Administrative Post, Zambézia province, through Brazilian investment. With the intensification of the civil war in middle 1980s soybean production was abandoned in Mozambique (TechnoServe, 2011; Lopes, 2016).

The reintroduction of soybean in Mozambique was carried out in 2003 by the Cooperative League of the United States of America (CLUSA) in partnership with International Institute of Tropical Agriculture (IITA) and TechnoServe (TechnoServe, 2011; Lopes, 2016), which supported the implementation and development of adequate production techniques. The results of researches carried out by IITA showed that it would be possible to carry out, at regional level, a sustainable program to promote soybean cultivation(Walker and Cunguara, 2016).

InNiassa province, the cultivation of soybeans was reintroduced in 2012 by the forestry company Niassa Green Resources in partnership with TechnoServe(Lopes, 2016). However, after several years there are still lack of evidence about the current situation of the soybean production in that region. The present study attempts to assess the socioeconomic impact of the soybean production on farmer's welfare in Lichinga District..

MATERIALS AND METHODS

This study was carried out in Lichingadistrict, which is located in Niassa province, the largest province in northern Mozambique, and covers approximately 5342 km2(MAE, 2014). Agriculture is the dominant economic activity and is practiced on small plots of land called "machambas" with an average size of 1.5 ha (Landry and Chirwa, 2011). Most of people from these rural villages are farmers that produce mainly maize, beans and potatoes for subsistence purposes. Charcoal production and hunting are also others activities which bring income to the households (Marzoli, 2007).

Data Source

Primary data were used in this study from a total of 90randomly selected soybean farmers. Interviews and field observations were used to collect the data regarding soybeans farming and household information which included goods ownership, household size, gender, age, education, income sources and household income..

Data Analysis

After data collection, households were grouped based on the household goods ownership (bricks house, agricultural land ,motorcycle, cattle, bicycle, television, cellular phone, radio, bank account and birds).Points were attributed according to the ownership and quantities of selected basic household goods(Cahyat et al., 2007; Schreiner, 2013), after that, the households were grouped in different strata according to the number of points (Moderate 19 -37 points, poor 11 – 18points and very poor 0 – 10 points).

R program was used to perform basic descriptive statistics and regression analysis. Multivariable regression was used in attempt to understand which variable is significantly related to household income. The model is given as $Y = \beta_0 + \sum \beta_i X_{jk} + \varepsilon$,where Y is the dependent variable, β_i represents the regression coefficients and X_{jk} represents the factors affecting Y. So, the equation can be written as: $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7$

Where:

Y - Household income (Mozambican Metical.10^3)
X1 – Education level of Head of Household (years)
X_2 – Size of land (hectare)
X_3 – Number of family labour force
X_4 – Maize production (Yes=1, No=0)
X_5 – Beans Production (Yes=1, No=0)
X_6 - Nonfarm Income (Yes=1, No=0)
X_7 – Livestock Production (Yes=1, No=0)

RESULTS

In table 1, results regarding the socio-economic characteristics are presented. According to these results, most of the heads of households are male. Young people constitute the most representative part of farmers. However, most of them are concentrated in the group of people with primary or without formal education..

. According to table 2, in the absence of all the explanatory variables, soybeans farmers would

Table 1: Socioeconomic Characteristics

Characteristics	Percentage
Gender	
• Male	82%
• Female	18%
Age groups	
• Youth (<35 years)	60%
• Adults (35 -55 years)	30%
• Elderly (>55 years)	10%
Household Size	
• <5 people	30%
• 5-10 people	40%
• 11-15 people	10%
• >15 people	20%
Education	
• No education	22%
• Primary education (grade 1 - 7)	60%
• Lower secondary education (grade 8 - 10)	14%
• Upper secondary education (grade 11-12)	4%
• Bachelor or equivalent	0%

Survey results show that the majority of farmers are poor. Figure 1 shows the percentage distribution of farmer's social strata. It shows that more than half of farmer are still living in poor conditions, lacking basic household goods

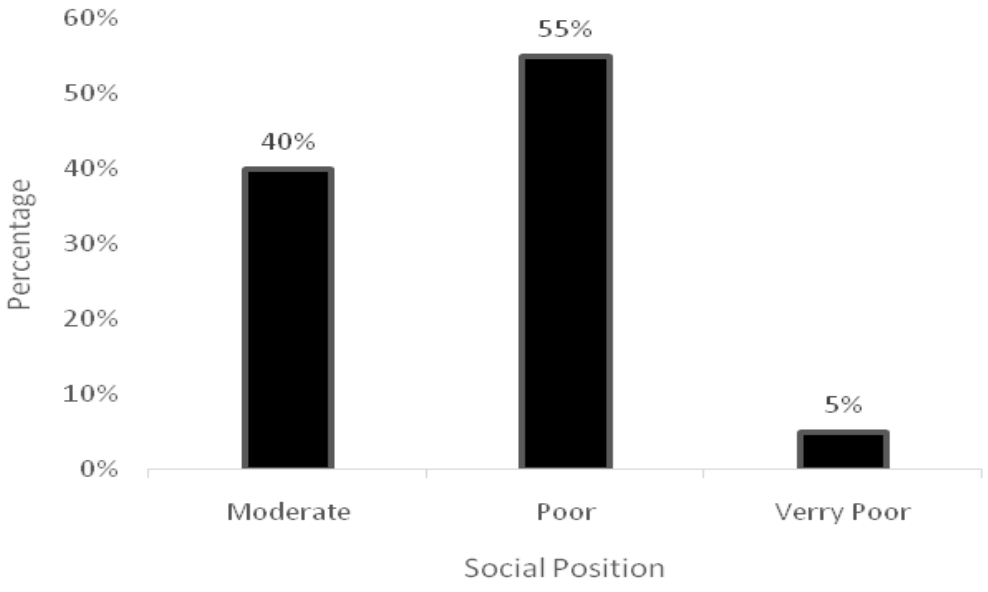

Figure 1: Social position of farmers

Furthermore, the regression analysis identified which explanatory variables were significantly related to the household income and the results are presented in table 2.

Table 2: Multivariate Regression Analysis

	Estimate	Std.Error	t-value	Pr(>|t|)
(Intercept)	16.8983	3.9528	4.275	5.13E-05***
Education	-0.0724	0.2924	-0.248	0.805
Land Size	-2.0283	2.3466	-0.864	0.3899
Household labor force	0.384	2.0412	0.188	0.8513
Maize	-3.741	2.63	-1.422	0.1587
Beans	-0.7611	2.2747	-0.335	0.7388
Nonfarm Income	-5.0432	2.134	-2.363	0.0205*
Livestock	6.3246	2.7224	2.323	0.0226*

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

earn an average of 16898.3 Mozambican Metical (279 USD) per month. Furthermore the results indicates that having an non-agricultural source of income will reduce an average of 5043.2 Mozambican Metical of the monthly household income and being a livestock farmer will increase an average of6324.6 Mozambican Metical to households income. This means that farmers practice both soybean and livestock production simultaneously may earn around 33796.6 Metical (556.17 USD) on average. Apart from nonfarm income and livestock production, no other variable had significant effect on household's income at 5% of significance level.

DISCUSSION

According to the results a large number of the households are classified as poor households and this may have a correlation with the high number of farmers with low level education. Omobolanle et al.,(2005) state that less educated farmers tend to be resistant to technology adoption, which results in poor farm income. In addition, the existence of few middle-aged farmer (35-44) may be the reason of the high level of poverty. Farmers with ages between 35-44 years are the most productive, hence both younger and older farmers are inefficient(Tauer, 2017), due to lack of experience among younger farmers, since knowledge and skills in agriculture increase with age (Guo et al., 2015) and the downward trend among elderly(Tauer, 1995).

Only 30% of the households were found to be small in size (less than 5 persons). Many scholars have been reported the positive effect of household size on agricultural productivity (Adikwu, 2014; Trong and Napasintuwong, 2015; Urgessa, 2015) however,(Shapiro, 1990) claims that household size increases may reflect incentive problems as well as a tendency toward greater diversification of household activities which may affect negatively agricultural productivity.

Table 2 shows no significant effect from maize and beans production, in fact, this happens because both maize and beans are staple food in Lichinga district and are largely produced for subsistence purposes (Landry and Chirwa, 2010), hence there is no effect from these crops to household income. Having a non-farm activity affects negatively the household income. It implies that non-farm income source are less productive than the soybean production. The intercept shows that farmers who exclusively dedicate to soybean production earn an average of 16898.3 Mozambican Metical, which is higher than the average monthly expenditure of around 3000 Mozambican Metical in rural Mozambique (INE, 2015). This results corroborate with the results found in Nigeria by Sanginga et al. (1999), where soybean has brought significant impacts on the goods acquisition and household welfare. The livestock production affects positively the

household income, constituting a positive additional source of income.

CONCLUSIONS

The results show that most of the farmer are young and living in poor households. Also, household income is affected positively by livestock production and negatively by non-farm income. The productions of maize and beans have no significant impact on household's income due to the fact that these crops are mostly produced for subsistence purposes.

Regarding these results it can be concluded that soybeans farmers who dedicate most of the time on agricultural activities are more likely to maximize their income. Also, producing maize and beans for commercial purposes may be a positive attitude toward poverty alleviation.

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