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Soybean Production Performance and its Constraints in Saki East Local Government

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Abstract

The importance of soybeans is not limited to only the supply of protein to the diet of Nigerians but also contributes immensely to the economic development of rural farmers. Therefore, this study investigated the economics of Soybean production and its constraints in the Saki East Local Government Area of Oyo State, Nigeria. The Soybean farmers were randomly sampled with the aid of structured questionnaires to elicit needed variables. Data collected were analyzed using descriptive statistics (frequency table, percentages, mean and standard deviation) and production performance indicators. The mean age of the respondents was 40 ± 9.9 years. Most of the soybean farmers were male with formal education. 98% had soybean farming as their secondary occupation with farming experience of 8±2.6 years. 54% practiced mono cropping while others practiced mixed cropping. The majority of the soybean farmers used their personal savings in financing their soybean farm, 72% did not belong to any association and 78% got their information from other farmers. The gross margin (GM) was ₦406,134.97 with a Net Farm Income of ₦394,675.17 and Benefit Cost Ratio (BCR) of 1.34. The challenges encountered by soybean farmers include; herdsmen/cattle, soybean planting, soybean threshing, access to land and finance. In conclusion, this empirical research has provided evidence that soybean cultivation is a profitable venture and constraints are highlighted. It is recommended that any prospective investors should consider soybeans production and to improve performance, the constraints should be addressed by the relevant stakeholders.

Introduction

Soybean belongs to the family Leguminosae, sub-family Papiplonaceae, and the genus *Glycine max* (L) Merril, and it is an annual crop of great economic importance and was domesticated in America, Girei *et al.* (2018). It occupies the third position next to wheat and rice in cereal world production, Khojely *et al.,* (2018). According to the submission of Girei *et al*., (2018) and Myaka *et al*., 2005, inestimable utilities of soybeans have widened the demand-supply gap in the world market that Nigeria and by extension, Africa can benefit by contributing to its production. Rising local consumption stimulated by its uses in animal feed industries also aggravates the demand-supply deficit of soybeans, Girei *et al*., (2018). It has been envisaged that the demand-supply gap for soybeans will soon reach an exponential level due to increasing series of environmentally sustainable products that are derivable from its processing, (NEPC, 2010).

Globally, soybean is one of the main sources of healthy vegetable oil recognized and recommended by the nutritionists, Dugje *et al*., (2009). It is rich in fibre, protein and has low cholesterol. Soybean has been documented as an affordable and nutritious meal, especially for malnourished nursing mothers and children (Girei *et al.,* 2018; Khojely *et al.,* 2018; Myaka *et al*., 2005). Soybean production is increasing popularity, even among female farmers, according to Dugje et al. (2009). Among the reasons for this are: as an economic crop with a high potential source of income, as a low-cost and nutrient-rich food crop that improves nutrition and family health, promotion of poverty alleviation programs, improvement of soil fertility, and striga

control,among others (Girei et al., 2018); Samuel and Wondaferahu, 2015; Dugje et al., 2009..

For these reasons there are several programs and research institutions promoting the production of soybean in Nigeria such as the International Institute of Tropical Agriculture (IITA), Promoting Sustainable Agriculture in Borno (PROSAB) 2004-2009, The Soybean Innovation Lab (SIL) and Olams Group, (NEPC, 2010). Programs promoting the production of soybeans have been extended to the study area (Saki East) in recent times. However, soybean production has not attained the expected economic level of production among farmers in the study area. More importantly, the current total output of soybeans of one 1,000, 000 MT per annual has not reduced the national demand-supply gap of 200,000 MT and this suggests that there could be some constraints in its production, NEPC (2010) and Ehirm *et al*.; (2017). Therefore, it is expedient to add to the body of knowledge by examining the performance and constraints of soybeans production among the farmers in the study area. The objective of this article is to examine soybeans production performance and its constraints in the Saki East Local Government Area of Oyo State.

Materials and Methods

Study area

The study was carried out in Saki East Local Government Area with its headquarters in AgoAmodu town in Oyo State of Nigeria. The geographical location of the study area covers a land area of 1569km² on the latitude of 8º43˙0°N and longitude of 3°43˙0°E with a population of 110,223 as at the 2006 census and an average temperature of 27°C, Alo and Onilude (2021). According to Alo and Onilude (2021), the five major towns in the study area namely: Agbonle, Ago-Amodu, Ogbooro, Oje-Owode, and Sepeteri. The local government council is bounded in the north by Oorelope local government, to the south by Atisbo and Olorunsogo to the East and SakiWest to the west. Saki-East local government. The main occupation in this area is farming, trading and others. The climate of the area is favourable for the cultivation of food crops such as Soybeans, Maize, Yam, Cassava, Millet, Rice, Plantain, Melon, Potatoes and Cashew. The area has two main seasons: the dry season and raining season which starts from December to February and the raining season which starts from March/ April to October/November.

Sampling procedure and sample size

Primary data were collected using structured questionnaires. A multistage sampling technique was adopted for the selection of respondents in the study area. The first stage involved purposive sampling of soybeans farmers in the Saki East Local Government Area and followed by a selection of 5 out of 10 wards in the Area. While the last stage was the selection of 30 registered soybeans farmers from each of the 5 wards making a total of 150 farmers.

Method of Data Analysis

The data sampled were analyzed using descriptive statistics: mean, frequency distribution and percentages. Also, economic performance indicators such as Gross Margin (GM) and Benefit-Cost Ratio analysis were used for profitability analysis

Gross Margin = TR - TVC

$$BCR = \frac{TR}{TVC}$$

where GM = Gross Margin (₦); TR = Total Revenue (₦); TVC = Total Variable Cost (₦); BCR = Benefit–Cost Ratio

Results and Discussion

Socioeconomics characteristics of the respondents

Table 1 reveals that a greater proportion; 84% of the soybean farmers were male, while 16% were female. This shows that there is more male engaged in soybean farming and this corroborated the result of Noad *et al*., (2017) who found that the field of agriculture production is more dominated by male. Specifically, Girei *et al*., (2018) submitted that soybean production is dominated by male and culturally female mostly involved in domestic activities, processing, marketing and other related farm services.

In terms of age, 14% of the respondents were less than 30 years while 38% were within the age range

of 30 -40 years. In addition, 38% and 15% fell between the ages of 41 – 50 and above 50 years, respectively. The mean age of the respondents was 40 years with a standard deviation of 9.9 years. This was substantiated in the findings of Oluwafemi *et al.,* (2019) and Kingsley *et al.,* (2014), who reported that the age range of 20 to 50 years constitutes the active workforce of the rural population. Girei *et al*., (2018) opined that age has an important impact on the judgment and perspective of farmers relative to risk aversion, adoption of improved and new innovative technologies, and other farm production-related decisions.

According to Girei *et al.,* (2018), education is a key socio-economic factor that affects farmer's decisions because of its influence on the awareness, perception, reception and quick processing and adoption of innovation that led to efficient farm management and improved productivity. The findings of this study on soybean farmers' level of education show that 8% had primary education, 14% had secondary education, 60% had OND or NCE education while 12% and 6% had B.Sc and post-graduate education, respectively. It implies that all soybeans are literate farmers having varying degrees forms of educational attainments. The implications of a higher population of educated farmers in the study area are that the latest information on soybean production issues would be easily exchanged among them and other farm management skills such as record keeping and accounting, adoption of new information and technology will be much easier and will not be a major challenge.

Also, the occupation of the farmers was examined from primary and secondary perspectives. The distribution of primary occupation of the sampled collected revealed that 34.7% of the respondents were artisans, 28% were farmers, 21.1% were teachers, 12% were traders and the remaining 4% were surveyors. Whereas, the results of the analysis of the secondary occupation reveal that 98% of the respondents were predominantly using farming to augment their family income while 2% were traders. Summarily, the analysis revealed that farming is not the primary source of livelihood in the study area, but they engaged in soybeans production to supplement their livelihood. According to Table 1, more than 68% of the respondents had between 1 and 5 years of farming experience, 22% had 6-10 years of farming experience, and 10% had above 10 years of farming experience. The average years of farming experience were found to be of 8 years with a standard deviation of 2.6 years. The implications of the outcome of the years of experience is that the majority of the soybeans farmers were still young in farming activities and they need a series of training and enlightenment to enhance soybeans production skills. This is in agreement with the findings of Oluwafemi *et al.,* (2019) who opined that the majority of the farmers are still young and need to acquire more technical ideas on how to manage their farms. The mode of the soybean farming system differs with geographical factors. The individual farmer decides on the most suitable cropping system. Also, the results show that 54% of soybeans in Saki East Local Government practiced mono cropping while 46% of the respondents practised mixed cropping. It is clear that the monocropping system of soybeans farming is prominent in the study area. Among the soybeans farmers that practiced a mixed farming system, the majority 70% planted soybeans and maize, 16% planted soybeans and sorghum and 14% planted cassava.

The sources and timely administration of fund has a significant effect on the scale of farm planning and operations. The source of funds could pose a constraint to the amount that is timely available, accessible, and affordable by the farmers. The results of the sources of finance used by soybeans farmers in Saki East Local Government show that the majority, 70% used personal savings in financing their soybean farm while 24% and 6% got finance from cooperative and commercial banks, respectively. It should be noted that soybeans farmers resolved to personal saving and cooperative society mostly for stringent conditions on commercial bank loans make it unaffordable and thus, this set limitations to the scale of their farm operations

Self–help groups or associations are now evolving whereby people with common interests or professions harness their resources to proffer

solutions to their common problems. This study examined to what extent soybean farmers have imbibed the idea of being a member of a self-help group or association. The result shows that in larger proportions, 72% of the respondents were not part of any association while 28% of the respondents belonged to the soybean farmer association in the study area. Also, timely access to information from reliable sources contributes to effective farm decision processes that could enhance economic well-being. Therefore, the sources of soybeans information available to the farmers were investigated. It was revealed that the majority, 78% of the soybeans farmers got information from fellow farmers, 18% got information from the radio while 2% and 2% got their information from social media (WhatsApp) and extension agents, respectively. The implication of the result is that, although many are yet to join the association there was a high level of personal interactions that could promote and enhance the rapid spread and adoption of new innovations and technology among soybeans farmers in Saki East Local Government Area.

Soybeans production performance in the study area

There are performance measurement parameters and indicators for every production entity. Among such indicators of performance are gross margin (GM), Net profit (NP), and Benefit Cost Ratio (BCR). For the Soybeans production performance analysis in Saki East Local Government Area, performance measurements employed in this study are gross margin (GM) and Benefit-Cost Ratio (BCR). The average Total Variable Cost for a typical soybeans farmer was estimated at ₦294,843.59 per hectare, 10% depreciation rate was calculated on the equipment used making the Total Fixed Cost to be ₦11459.8 per hectare resulting in a Total Cost of ₦306,303.39 per hectare, ceteris Paribus. Also, the average Total Revenue generated from the sale of soybeans by a typical farmer was ₦700,978.56 per hectare, Gross Margin and Net Farm Income were ₦406,134.97 and ₦394,675.17 per hectare, respectively while the benefit-cost ratio was 1.34.

The implication of gross profit and Net profit being positive is that soybeans production performance in Saki East Local Government Area is economical, which is profitable. Furthermore, the consequence that the benefit-cost ratio was greater than 1 for soybeans investment or project denoted that the project is considered viable and should be accepted as a feasible farming enterprise. This implies that soybeans production is worth of investment for any potential investor.

Challenges faced by soybean farmers in the study area

Farm production usually has some peculiar degree of constraint that pose challenges to effective management. Therefore, such production constraints of soybeans were considered in this study. Results in Table 3 shows the degree of challenges faced by soybean farmer include; herdsmen/cattle invasion ($\bar{x}$ = 1.27), soybean planting ($\bar{x}$ = 1.24), soybean threshing ($\bar{x}$ = 1.23), access to land ($\bar{x}$ = 1.16), finance ($\bar{x}$ = 0.63), weather ($\bar{x}$ = 0.52), labour ($\bar{x}$ = 0.29), marketing of soybean ($\bar{x}$ = 0.27), pest and disease ($\bar{x}$ = 0.15). This result is in line with the findings of Akinyemi *et al.,* (2017) who have identified pests and diseases, herdsmen destructive activities and high cost of labour as challenges faced by Nigerian farmers.

Conclusion and Recommendation

This study examined the soybean production performance and results revealed that a typical farmer was young and was mostly male with a formal education profile. The farmers engaged in soybean farming as their secondary occupation with farming experience of 8±2.6 years, practiced mono cropping while others practiced mixed cropping and mostly used their personal savings in financing their soybean farm. The majority did not belong to any association and sourced their information from other farmers. The gross margin (GM) was ₦406,134.97 with a Net Farm Income of ₦394,675.17 and Benefit Cost Ratio (BCR) of 1.34. Soybean producers faced issues with herdsmen/cattle, soybean planting and threshing, as well as access to land and funding. In conclusion, the study offered compelling evidence

that soybean farming was a viable endeavor with noted constraints. It is recommended that any prospective investors and young graduates explore soybean production, and that constraints be addressed by the relevant stakeholders in order to increase performance

Table 1: Distribution of socioeconomic characteristics of respondents

Variables	Frequency	Percentage	Mean ± Standard deviation
Sex			
Male	126	84	
Female	24	16	
Total	150	100	
Age (years)			
<30 years	21	14	
30 – 40	57	38	
41 – 50	57	38	40.4±9.9
>50	15	10	
Total	150	100	
Educational level			
Primary	12	8	
Secondary	21	14	
NCE	90	60	
B.sc	18	12	
Postgraduate	9	6	
Total	150	100	
Primary occupation			
Artisan	52	34.7	
Teaching	32	21.1	
Farming	42	28	
Trading	18	12	
Surveying	6	4	
Total	150	100	
Secondary occupation			
Trader	3	2	
Farming	147	98	
Total	150	100	
Years of experience			
1-5	102	68	
6-10	33	22	8±2.6
>10	15	10	
Total	150	100	

Variables	Frequency	Percentage
Cropping system		
Mono cropping	81	54
Mixed cropping	69	46
Total	150	100
Type of crop mixed with soybean		
Cassava	10	14
Maize	48	70
Sorghum	11	16
Total	69	100
Source of finance		
Personal saving	105	70
Cooperative society	36	24
Commercial banks	9	6
Total	150	100
Member of association		
No	108	72
Yes	42	28
Total	150	100
Source of information		
Radio	27	18
WhatsApp	3	2
Extension agent	3	2
Other farmers	117	78
Total	150	100

Table 2: Profitability of Soybeans Production per hectare of Land

Items of Cost	Total Cost (₦)
A. Variable Cost	
Cost of Land preparation per hectare	101,450.45
Cost of rent on land per hectare	22,790.45
Cost of Soybeans seed per hectare	21,908.34
Cost of Labour for planting per hectare	4,050.50
Cost of Herbicide per hectare	25,905.67
Cost of other Agrochemicals	35,780.90
Cost of Weeding per hectare	23,907.01
Harvesting cost per hectare	35,590.67
Transportation cost	23,459.60
Total Variable Cost	294,843.59
B. Fixed Cost	
10% Depreciation rate on equipment	11459.8
Total Fixed Cost	11459.8
Total Cost (A + B)	306,303.39
Revenue from sale of Soybeans	700,978.56
Gross Margin = TR – TVC	406,134.97
Net Farm Income (NFI) = TR – TC	394,675.17
Benefit – Cost Ratio = NFI/TVC	1.34

Table 3: Challenges faced by the soybean farmers in the study area

Nature of challenges	Low F %	Moderate F %	Severe F %	Weighted score	Rank
Herdsmen/cattle	0 (0)	15 (10)	135 (90)	1.27	1st
Soybeanplanting	3 (2)	15 (10)	132 (88)	1.24	2nd
Soybeanthreshing	3 (2)	18 (12)	129 (86)	1.23	3rd
Access to land	9 (6)	21 (14)	120 (80)	1.16	4th
Finance	30 (20)	99 (66)	21 (14)	0.6	5th
Weather	51 (34)	81 (54)	18 (12)	0.52	6th
Labour	87 (58)	60 (40)	3 (2)	0.29	7th
Marketing of soybean	108 (78)	36 (24)	6 (4)	0.27	8th
Pest and disease	126 (84)	15(10)	132(88)	0.15	9th

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