



## Characteristics of farmers participating in USAID Markets II Soybean production project in Benue State, Nigeria

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DOI: <https://doi.org/10.33545/2664844X.2019.v1.i1a.4>

### Abstract

The study examined the characteristics of farmers participating in USAID MARKETS II soybean production project in Benue State, Nigeria. The population for the study included all project participant soybean farmers of USAID MARKETS II project. A total sample of 150 respondents were purposively selected from all the eight soybean producing local government areas participating in the project in the State. While interview schedule was used for data collection. Percentage and mean score were used to present and analyse the data. The results of the study revealed that USAID MARKETS II soybean farmers in Benue State were mainly male, middle aged, with long years of farming experience, large household size and attained formal education. Majority of them acquired land mainly through inheritance and borrowing. They also purchased farm inputs from open market at high price. Greater proportion of the farmers likewise sold their farm produce at open markets at giveaway prices. All the participants grew improved varieties of soybeans but had inadequate extension services. Consequently, the farmers had low farm output, yield and income. The study therefore recommends closer examination and consideration of various attributes of the soybean farmers in designing and implementing future phases of the project to enhance its success in the study area in order to improve the welfare of the local farmers participating in the project.

**Keywords:** characteristics, farmers, USAID markets II, soybean, Benue and Nigeria

### 1. Introduction

The soybean (*Glycine max*) is a specie of legume native to Eastern Asia (Onasanya, 2002) <sup>[12]</sup> and introduced into Nigeria in 1908 (AMREC, 2007) <sup>[3]</sup>. With improvement in breeding and processing research, soybean cultivation, domestic market, processing and utilization have grown considerably in Nigeria. The importance of soybean in food security especially for the poor in Nigeria cannot be overemphasized. It is the best source of plant protein, substituting the animal-protein sources, which are usually inadequate in supply for poor households. However, the availability of the commodity seems to be insufficient to meet the demand of consumers due to poor yields per hectare by the local farmers (Agada, 2015) <sup>[2]</sup>.

In order to boost production of the commodity, The United States Agency for International Development (USAID) in 2012, introduced a project known as MARKETS II (i.e. Maximising Agricultural Revenue and key Enterprise in Targeted Sites) in Benue State since the state is the major producer of soybean in Nigeria (USAID, 2015 and Nyiakura, 1982) <sup>[18, 11]</sup>. MARKETS II in Benue State is packaged with modern soybean production technologies aimed at teaching the relevant agronomic practices and empowering Benue State farmers to increase production of soybean. Key objectives of the project were to help smallholder farmers access better inputs (such as improved seeds and optimal use of fertilizer), adequate finance, better water management, appropriate technology, extension services, and improve nutritional uses of grown or purchased basic foods (USAID, 2015) <sup>[18]</sup>. It also provided technical assistance to build

productive, commercially sustainable agricultural commodity value chains by linking farmers to large and medium sized processors. The project centres on smallholder soybean farmers, which are in groups of 20 – 35 persons who varied in personal, socioeconomic and agronomic characteristics. The study therefore examined the characteristics of these farmers who were trained by the project to adopt the new farming techniques since the attributes of a farmer influences his ability to obtain, process and use information relevant to adoption of a new technology. The study will enable the project planners to become more conversant with the attributes and needs of soybean farmers participating in the project in order to bring additional innovations that are more compatible and suitable to the people in the study area whether in soybean production or other related future farm projects.

### 2. Methodology

The study was carried out in Benue State, Nigeria. The population for the study comprised all registered Markets II soybean farmers in the entire eight soybean producing local government areas (LGAs) in Benue State. These LGAs were Tarkaa, Gboko, Gwer and Buruku from Benue North West Senatorial District (Zone B) and Konshisha, Ushongu, Kwande, and Vandeikya LGAs from Benue North East Senatorial District (Zone A).

Multistage, purposive and proportionate random sampling techniques were employed in selecting the respondents for the study. In the first stage, all the eight LGAs participating in the

project were used for the study. In stage two, two soybean farmers associations (S.F.A.) that participated in the project were randomly selected from each LGA giving a total of sixteen (16) soybean farmers associations. In stage three, proportionate sampling was used in selecting the respondents from each soybean farmers' association (30% of the members of each soybean farmers association was selected) to obtain a total of 150 respondents that were used for the study. Interview schedule which dealt on specific objectives of the study was used to collect primary data for the study while simple percentage, mean and frequency were used for data analysis.

### 3. Results and Discussion

#### 3.1. Personal characteristics of the farmers

##### Sex

The results in Table 1 reveal that greater percent (63.3%) of the participating farmers in USAID MARKET II project were male. This may be as a result of the fact that soybean was traditionally a male crop in Benue State (Agada, 2015) [2]. In addition, many men have economic advantage over women in Benue communities since they control family resources like farm land and income thereby limiting women participation in the project.

##### Age

The results in Table 1 also show that greater proportion of the respondents (49.3%) were within the age of 42-52 years followed by those within the age of 53-63 years (22.0%) and 31- 41 years (21.3%). The respondents that were above 63 years constituted 4%, while those within 30 years and below accounted for 3.3%. The mean age was 46.50 years. This implies that participating farmers in the project were adult at their active, middle and productive ages and physically disposed to farming activities and may have the willingness to adopt innovations in soybean production in the study area. This finding is in line with that of Umaru (2015) [16] who stated that majority of soybean farmers were still within their middle, active and productive ages and hence can engage efficiently in soybean production and accept new technologies.

##### Marital status

The results in Table 1 show that the majority (94.7%) of the respondents were married, while 5.3% were single. The larger number of the married people participating in the project may be attributed to the fact that they have many family responsibilities and are willing to engage in one economic activity or the other in order to cope with family needs and challenges unlike the singles who has less responsibilities. This result is in line with the view

of Daudu (2013) [4] who reported that married people accounts for majority of soybean farmer's population in Benue State.

##### Household size

Entries in Table1 further reveal that greater proportion (42.2%) of the soybean farmers participating in USAIDMARKET II project had household size of between 11-15 persons, while 38.7% of them had a household size of between 6-10 persons. The remaining 10.5% and 8.7% of the respondents had a household size of 1-5 and above 15 persons respectively. The mean household size was 11 persons. The large household size could serve as source of family labour who may engage in farm activities like land clearing, planting, weeding, harvesting, and winnowing of soybean to increase income of the farmers. Agada (2015) [2] affirmed that large household size is an advantage for labour provision in soybean production in Benue State. Similarly, Swai, Mbwambo and Magayane (2012) [13] reported that large household sizes are important assets in working together to reduce poverty among farming families.

##### Educational qualification

The results in Table 1 further show that greater proportion (44.0%) of the soybean farmers participating in MARKETS 11 project had attempted secondary education. This was followed by respondents who had completed secondary education (26.0%). Those who acquired OND/NCE constituted (12.0%), those who attempted only primary school education were (11.3%), primary school completed (6.70%), while those who had no access to formal education were 5.3%. The result also showed that 1.3% and 0.7% of the respondents represented those who had acquired degree and higher degrees respectively. The mean number of years spent acquiring formal education was 8.81 years. This implies that majority of the farmers participating in the project had acquired formal education. The larger number of educated farmers in the project may be worthwhile to the fact that formal education acquired create a favourable mental attitude for the acceptance of new practices in soybean production. Adesoji and Adebayo (2008) [1] observed that the more educated a farmer is, the more the chances that the farmer will adopt innovations than the uneducated ones. In the same vain, Mignouna *et al.* (2011) [8] and Lavison (2013) [7] reported that education level of a farmer increases his ability to obtain; process and use information relevant to adoption of a new technology. This is because formal education provides them with the ability to read and write, handle and interpret messages relating to their farm operations in the instruction manuals on input and machinery uses, and also enable them to appreciate extension services.

**Table 1:** Personal characteristics of the farmers

Variables	Frequency (n=150)	Percentage	Mean
Sex			
Female	55	36.7	
Male	95	63.3	
Age			
≤ 30 years	5	3.0	
31-41	32	21.3	
42-52	74	49.3	46.50
53-63	33	22.0	
Above 63 years	6	4.0	
Marital Status			

Single	8	5.3	
Married	142	94.7	
Household Size			
1-5	13	8.7	
6-10	58	38.7	11.0
11-15	64	42.7	
Above 15	15	10.0	
Educational Qualification			
No formal education	8	5.3	
Primary school attempted	6	4.0	
Primary school completed	10	6.7	
Secondary school attempted	66	44.0	
Secondary school completed	39	26.0	
OND/NCE	18	12.0	
Degree	2	1.3	
Higher educational qualification	1	0.7	
Number of years spent in formal education			
≤ 5 years	37	24.7	
6 – 12 years	90	60	
Above 12 years	23	15.3	8.81

Source: Field Survey, 2017

### 3.2. Socio- economic characteristics of the respondents

#### Sources of agro inputs

Table 2 also shows that the majority (84.7%) of the farmers participating in USAID MARKET 11 project purchased agro inputs in open market against the initial plan of the project to link farmers with appropriate input dealers. The result further shows that 8.7% of the participants got farm input from input dealers linked to USAID, while 6.7% of the respondents obtained inputs from other farmers. Since most of the farmers got input from other sources rather than through USAID assistance, it therefore implies that the project objective of linking farmers with appropriate input dealers to access quality input at affordable rate have not been achieved. The failure to link project participants with appropriate input dealers might be as a result of lack of proper interaction among all the stake holders, inadequate monitoring and evaluation of the project as well as bureaucracy that characterized it. Regular monitoring of every stage of the project will not only enable the project management to assess project performance and needs of the farmers but will also help to close the gap that might exist between the stakeholders.

#### Sources of farm land

The results in Table 2 show that the majority (68.0%) of the respondents inherited land from their ancestors, 16.7% borrowed from other farmers, respondents that rented land for cultivating soybean constituted 13.3% while only 2.0% of the respondents purchased land for growing soybeans. It can be inferred from the findings that land is readily available to the larger proportion of the participants of the project since the majority have their own land through inheritance and those who do not have could easily borrow or rent for farming.

#### Membership of farmers' cooperative

Entries in Table 2 further reveal that the majority (81.3%) of the respondents were members of farmers' cooperative. The larger membership suggest that farmer's cooperatives groups are beneficial to members by providing a medium through which extension information can easily reach to members there by enhancing adoption of innovation. Mignouna *et al.* (2011) [8] and

Katungi and Akankwasa (2010) [6] reported that belonging to a social group enhances social trust, idea, and information exchange that engages members in social learning about the technology hence raising their likelihood to adopt the technology.

#### Access and source of credit

Entries in table 2 reveal that the majority (76.0%) of the respondents had access to credit, only 24% of the respondents had no access to credit facilities. Further analysis revealed that among these that had access to credit, Isusu was the main (69.4%) source of credit for the project participants, followed by bank loan (53.2%) obtained through USAID MARKET II assistance. The remaining respondents sourced credit from friends/relations (30.6%), personal savings (18.0%) and money lending (4.5%). The high source of credit from Isusu may be due to the fact that most of the farmers are members of local financial associations where they can easily access micro credit without collateral to invest in their soybean farms to boost production. This result agrees with findings of Nasiru (2010) [10] who stated that access to micro-credit could have prospects in improving the productivity of farmers and contribute to uplifting the livelihoods of disadvantaged rural farming communities. It also agrees with Ekong (2003) [5] asserts that credit is a very strong factor that is needed to acquire or develop any enterprise; its availability could determine the extent of production capacity.

#### Estimated soybean output and yield

The result presented in Table2 show that the majority (57.3%) of the farmers had farm output of less than 1000 Kg. The result also show that 38.7% them produced between 1001-2001 kg, only 4.0% of the respondents had soybean output of between 2002-3002 kg. The mean farm output of farmers was 966.1kg. Further entries in table 2 reveal that the majority (51.3%) of the soybean farmers had yield of between 0.51 – 1.1 tons per hectare. This was followed by 48.0% of the respondents who had less than 0.51 tons per hectare. The result also show that only 0.7% of the respondents had farm yield of more than 1.1 tons per hectare. The mean farm yield of project farmers was 0.52 tons/ hectare. This results indicate that participating farmers had low yield per

hectare when compared with the expected standard soybean yield of 1,700kg /hectare in Nigeria (AMREC, 2007) [3]. The low yield might be attributed to many factors including untimely availability and high cost of critical farm inputs like fertilizers and incessant attacks on farmers from herdsmen which prevented many of them from properly carrying out important farming activities like timely weeding and harvest that adversely affected their yield.

### Estimated annual income

Table 2 shows that the majority (59.3%) of the respondents had estimated annual income of less than or equal to ₦200,000 annually, followed by 26.7%, 9.37% and 4.7% of the respondents who realized between ₦200,001 -₦300,001, above ₦400,002 and between ₦300,002 – ₦400,002 per annum. The average annual income was ₦231,446. This implies that the majority of the farmers had low annual income which may be inadequate to meet basic family needs like school fees and hospital needs of children

and may not be willing to take risk of adopting the new technologies particularly when they are cost ineffective. According to Diiro (2013), farm income is expected to provide farmers with liquid capital for purchasing productivity enhancing inputs such as improved seeds and fertilizers.

### Estimated annual income from soybean

Entries in Table2 show that greater percentage (48.7%) of the respondents had income of between ₦100,001 – ₦200,001 from soybean production. This was followed by those with annual soybean income of less than or equal to ₦100,000 (40.7%), those with income of ₦200,002- ₦300,002 accounted for 8.7%, while 2.0% of the respondents got annual income of more than ₦300,002 from soybean production. The mean annual income from soybean production was ₦126,850. This finding contradicts Agada (2015) [2] who reported an annual mean soybean farm income of ₦ 61, 78 in Benue State.

**Table 2:** Socio- economic characteristics of the farmers

Variables	Frequency (n=150)	Percentage	Mean
Main source of agro inputs			
Input dealers linked to USAID	13	8.6	
Other farmers	10	6.7	
Open market	127	84.7	
Major source of farm land			
Inherited	102	68.0	
Purchase	3	2.0	
Rented	20	13.3	
Borrowed	25	16.7	
Membership of farmers Association			
Yes	122	81.3	
Access to credit			
Yes	111	76.0	
Sources of credit (n=111)			
Isusu	77	69.4	
Bank loan	59	53.2	
Friends/relations	34	30.6	
Personal savings	20	18.0	
Money lenders	5	4.5	
Estimated soybean output (kg)			
< 1000 Kg	86.	57.3	
1001-2001 kg	58	38.7	
2002-3002 kg	6	4.0	966.1
Estimated soybean yield (tons)			
< 0.50 tons	72	48.0	
0.51 – 1.1 tons	77	51.3	
Above 1.1 tons	1	0.7	0.51
Estimated annual income			
≤₦200000	89	59.3	
₦200001-₦300001	40	26.7	
₦300002-₦400002	7	4.7	231,446
Above ₦400002	14	9.3	
Estimated income from soybean			
≤₦100000	61	40.7	
₦100001-₦200001	73	48.7	
200002-₦300002	13	8.7	126,850
Above ₦300002	3	2.0	

### 3.3. Agricultural Characteristics of the farmers

#### Years of farming experience

Table 3 reveals that greater proportion (38.0%) of farmers participating in USAID MARKETS II had 22 – 32 years of farming experience, followed by those with 11 – 21 years

(31.37%). The entries in table 4 also show that farmers who had farming experience of more than 32 years accounted for 29.3%, while those with farming experience of 10 years or less represented 1.3%. The average years of farming experience was 26.33 years. The result is in line with the findings of Nwaleji, Madukwe, Agwu, and Umerah (2014) <sup>[9]</sup> who reported a mean rice farming experience of 22.2 years for farmers participating in USAID MARKETS project in Ebonyi and Anambra State. The long years of farming experience is an advantage for increased investment, productivity and technological capability.

The results in Table 3 show that the majority (53.3%) of the respondents had 11-21 years of soybean farming experience while 30.0% and 16.7 % of them had soybean farming experience of 10 years or less and 22 - 32 years respectively. The mean soybean farming experience was 13.76 years. This implies that soybean farmers participating in the project had long years of soybean farming experience which may offer them an advantage of gaining more understanding and also facilitate their adoption of new technologies. However, Umaru (2015) <sup>[16]</sup> observes that younger farmers with few years of experience are more flexible to new ideas and risk; hence they are expected to adopt innovations more readily than farmers with many years of experience nevertheless, this opinion is not popular among soybean farmers in the study area. It was rather observed that soybean farmers with many years of experience were more willing to adopt the new farming techniques to enhance their productivity than the younger farmers with less years of experience.

#### Total farm size

The results from Table 3 show that the majority (57.3%) of the farmers participating in the project had total farm size of 2 – 4 hectares while 28.0% and 14.7% represented those who had above 4 hectares and below 2 hectares of farm land respectively. The mean total farm size was 3.21 hectares. This indicates that the respondents are smallholder farmers. However, the result contradicts the findings of Agada (2015) <sup>[2]</sup> who reported a mean farm size of 2.1 hectares in Benue State.

#### Soybean farm size

Further results in Table 3 show that the majority (81.3%) of the respondents cultivated less than 1 hectare of land, followed by 16.7% and 2.0 % who cultivated between 1- 3 hectares and above 3 hectares of soybean respectively. The mean farm size for soybean production was 1.86 hectares. This implies that participants of the project grew soybean in small scale and hence may not be willing to take risk adopting an innovation. Lavison (2013) <sup>[7]</sup> and Uaiene *et al.* (2009) <sup>[15]</sup> stated that farmers with large farm size are likely to adopt a new technology as they can afford to devote part of their farm resources to try new technology unlike those with less farm size and financial resources.

#### Sale of soybean

The results in Table 3 also indicate that the majority (76.7%) of the respondents sold their soybean in open market, 21.3% sold to Hule Nig. Limited, while 2.0% of them sold to other processors. The fact that most of these farmers sold soybean produced in open market signify that the contractual agreement signed between USAID and Hule Nig. Limited to purchase all soybeans directly from the farmers under-price setting and buy-back arrangements have not been effectively implemented. This could also be that most middle men buy the commodity from open markets and resale to Hule Nig. to make profit; thereby depriving farmers from selling directly to the company. This might be as a result of inadequate information supplied to the farmers and lack of proper monitoring and evaluation of the project. Moreover, it was observed that most project participants were not aware of the existence of price setting and buy back arrangement between USAID and Hule Nig. limited. There were also situations where participating farmers sold their farm produce to open markets after waiting so long for the contracted company representatives. Thus it requires improvement of information generation and adequate monitoring and evaluation of the project if successful adoption of soybean technologies is desired.

#### Use of improved varieties

The results in Table 3 further reveal that all (100%) of the participants interviewed used improved varieties of soybean. It can be deduced from this result that the new soybean varieties offered by the project were accepted by the farmers probably because they were readily available to them, beneficial and consistent with their needs. Wandji *et al.* (2012) <sup>[19]</sup> reports that perception of farmers towards a new technology affects its uptake.

#### Access to extension agent

The results presented in Table 3 further show that majority (74.7%) of the respondents had access to extension services in 2016 cropping season. Details of the result indicates that among the respondents who had access to extension services, the majority (57.1%) of them had contact with extension agents for less than 2 times, this was followed by 22.3% of the farmers who accessed extension services more than 3 times, while those respondents who had contact with extension agents between 2- 3 times in 2016 cropping season accounted for 20.6 %. The mean extension contact was 2.17 times. The few number of extension contact implies that farmers participating in the project had less access to necessary information needed to enhance the adoption of the new farming practices. According to Umar, Ndanitsa, and Olaleye (2009) <sup>[17]</sup>, higher extension contacts would increase adoption of improved farm production technologies and that the frequency of extension contact is very essential as it guides the farmers from awareness to the adoption stage. On the other hand, Tiwari (2010) <sup>[14]</sup>, identified poor extension contact as one of the major constraints inhibiting innovation adoption.

**Table 3:** Agricultural Characteristics of the farmers

Variables	Frequency (n=150)	Percentage	Mean
Years of farming experience			
≤10 years.	2	1.3	
11-21	47	31.3	
22- 32	57	38.0	

Above 32 years	44	29.3	26.33
Years of experience in the production of soybean			
≤10 years.	45	30.0	
11-21	80	53.3	
21-32 years	25	16.7	13.76
Total farm size			
< 2 hectares	22	14.7	
2-4 hectares	86	57.3	3.32
Above 4 hectares	42	28.0	
Farm size for soybean production			
≤ 1 hectare	122	81.3	
2-4 hectares	25	16.7	1.86
Above 4 hectares	3	2.0	
Use of improve varieties			
Yes	150	100.0	
Access to extension services			
Yes	112	74.7	
Number of extension contact (n = 112)			
< 2 times	64	57.1	
2 – 3 times	23	20.6	
Above 3 times	25	22.3	2.17
Major place of sale of farm produce			
Hule Nig. limited	32	21.3	
Open market	115	76.7	
Other processors	3	2.0	

Source: Field Survey, 2017

#### 4. Conclusion

USAID MARKETS II soybean farmers in Benue State were mainly male who were middle aged with long years of farming experience, large household size and attained formal education. Majority of them acquired land mainly through inheritance and borrowing. They also purchased farm inputs from open market at high price against the initial objectives of the project of linking farmers with input dealers who would supply farm inputs to them at affordable price. Greater proportion of the farmers likewise sold their farm produce at open markets contrary to the ‘‘price setting and buy back arrangement’’ between USAID MARKETS II and Hule Nig LTD (the contractual company that supposed to buy the farm produce from the farmers to add value). All the participants grew improved varieties of soybeans but had inadequate extension services. Consequently, the farmers had low farm output, yield and income. The study therefore recommends a closer examination and consideration of farmers attributes in designing and implementing future phases of the project to enhance its success and other related agricultural projects in the study area in order to improve the welfare of the local farmers participating in such projects.

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