Analysis of Factors Influencing Participation of Farm Households in Watermelon Production in Some Selected Local Government Areas of Sokoto State, Nigeria

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ABSTRACT: *The study analyzed the factors influencing participation of farm households' in watermelon production in the study areas. Three local government areas out of Sokoto state were purposively selected. Questionnaire was used to collect data. Multistage of sampling techniques were used to arrive at the sample size of 181 farm households' for the study. Likert scale is used to analyse the level of participation of farm households', frequency and inferential statistics were used to analyze the data. The findings revealed that (55.8%) of the farm households are within the ages of 25-30 years, majority (96.7%) are male It shows that majority (64.0%) of the farm households participated in watermelon production as a result of higher income generated. Multiple regression analysis result revealed significant relationships between farm households participation in watermelon production and their socio-economic characteristics at P<0.05. The constraints faced by the farm households are storage technology and improved agricultural inputs. Most (63.5%) of the farm households believed that provision of subsidized agricultural inputs and market accessibility are forms of assistance that will encourages farm households to partake in watermelon production. It is recommended that government and donor agencies should encourage farm households' by providing them with the modern agricultural inputs so as to influence them to participate fully into watermelon production irrespective of their Socio-economic differences.*

Keywords: Analysis, Watermelon, Production, Farm, Households.

I.   INTRODUCTION

Watermelon (Citrulluslanatus) belongs to the family Cucurbitaceae whose centre of origin has been traced to Kalahari and Sahara deserts in Africa (Huh et al, 2008). From there, watermelon spread to countries along the Mediterranean Sea and even beyond. By the 10th century, watermelon found its way to China which is now the world's largest producer of watermelon. Thus, watermelon becomes one of the widely cultivated crops in the world. The top twenty leading producers of watermelon produce together 75% of the entire production worldwide, where Turkey, Iran and Brazil alone produces 20% of the production indices (Food and Agricultural Organization, 2012). African countries like Nigeria and Kenya produce watermelon in commercial quantities. For instance 139,223 tons and 66,196 tons of watermelon were produced in 2011 in Kenya and Nigeria respectively (Kim, 2008).

In Nigeria watermelon production is confined to the Northern part of Nigeria due to suitability of agro-ecological conditions of the region (Anon, 2006).Watermelon production is playing a vital role in reviving the economic activities, poverty reduction and improving the socio-economic status of it producers. For its nutritious value, watermelon is eaten fresh or used for other purposes. In terms of nutrient composition is 92% water and 8% sugar. It is rich in lycopene, an antioxidant that gives it its characteristic colour (Medicine Net, 2004). Other mineral content present in watermelon are potassium, magnesium, phosphorus, calcium, zinc, iron, and cuprum. Apart from nutrient value, it is an important source of medicine (Ignjatovic, 2005). Watermelon production in Sokoto state has dominated small scale farm households' that scere found in Isa, SabonBirnin, and Shagari local government areas of the state (Daily Trust, 2016).

Watermelon is considered the most preferred exotic vegetables produced in large quantities and most

consumed cucurbit because of its economic, health and nutritional values. Watermelon has the highest lycopene content among fresh fruits and vegetables; watermelon contains 60 % more lycopene than tomato. Lycopene in the human diet is associated with prevention of heart attacks and certain cancers. Watermelon rind contains an important natural compound called citrulline, an amino acid that the human body makes from food. Citrulline is found in high concentration in the liver, and is involved with athletic ability and functioning of the immune system (Delannoy, 2006).

Participation is a very broad concept that means different things to different people (Kelly, 2001). The term is often used by people with different ideological positions who give it very different meanings identified that participation is an ideologically contested concept which produces a range of competing meanings and applications. The result is a variety of views on how participation is defined who it is expected to involve, what it is expected to achieve, and how it is to be brought about (Agarwal, 2001).

Participation is a physical engagement in which people hold complete power and are in full control of their program. Participation refers to involvement of marginalized groups in development process which intend to build farm household's abilities to access and control resources, benefits and opportunities towards self reliance and to make better standard of living. Farm households" participation plays a vital role in economic development and in poverty alleviation. Lack of participation in decision-making to implement agricultural policies can lead to failure in watermelon production. There are five types of farm households' participation which are: empowerment, partnership, interaction, consultation, information, and manipulation (Marthbor, 2008).

There are various reasons why active participation is very hard to achieve them include: households' lack of knowledge, confidence, capital, skills. Ignorance is considered as the main barrier to farm households' participation in watermelon production. Farm households' participation in planning and decision-making, shortage of incentives to those who participate, and lack of capable organization were contributing factors to farm households' participation (Aref, 2011).

Moreover, participation is a vital factor for sustainable development in watermelon production because it is critical in coming up with successful development plans. Base on this, even Mathbor, (2008) iterated that participation is considered necessary in order to get farm households' support for watermelon production. Watermelon is an important source of income for small scale farmers especially in the semi arid tropic of West Africa (Adekunle et al., 2011).

Farm households' based on agricultural activities are the means of organizing agricultural activities which are managed and operated by farm households' and predominantly reliant on farm households' labour (Food and Agricultural Organisation, 2011). The concept of farm households' is based on the arrangements made by persons, individually or in groups, for providing themselves with food or other essentials for living. A farm households' may be either (a) a one-person household, that is to say, a person who makes provision for his or her own food or other essentials for living without combining with any other person to form part of or a multi-person households' that is a group of two or more persons living together who make common provision for food or other essentials for living (Food and Agricultural Organisation, 2011).Farm households' may be defined as a small group of persons who share the same living accommodation or all of their income and wealth and who consume certain types of goods and services collectively, mainly housing and food.

The predominant view of farm households' is that they are units of consumption whose main resources come from wages (compensation of employees) property income or transfers. However, it is clear that farm households' can also have a production activity something that is of particular importance when considering agricultural households. Production of watermelon is among the primary sources of income for many farmers in the study area, watermelon on the other hand has the ability to replenish soil nitrogen (Anyanwu et al, 2003).

Production of watermelon has been characterized by some factors which tend to limit full participation of farm households' in watermelon production this could be due to the fact that the farm households' were faced with difficulty in acquiring improved agricultural inputs, handling and knowledge of processing; and other factors affecting watermelon production such as low income, unavailability of storage facilities, pests and diseases (Raily, 2006).

Indeed, there is low production of watermelon. The low production of watermelon could be due to assumption that farm households' are not interested in agricultural enterprise due to drudgery involved and other factors such as: low income, and nonchalant attitude of government in terms agricultural sectors, awareness of the economic importance of the watermelon, lack of technologies, marketing facilities of the watermelon, and technical knowhow of watermelon production. More so, Studies in the past have not addressed the analysis of the factors influencing participation of farm households' in watermelon production. This study will focus on this fact and give room for comparison with other studies.

Study of this nature is significant with a view to come up with empirical findings that serve as source of information to government, policy makers and farm households' to address the constraints associated with watermelon production. The overall agricultural policy of Nigeria is to harness all available resources to increase agricultural production and rural income for effective and progressive development (Uzwoke et al, 2003). Therefore,

farm households' must discover their needs to change their own misdirected priorities; gain skills and knowledge for self-reliance. However, farm households' participation in watermelon production help in developing their economic status. The research can help to encourage many farm households' to engage in watermelon production in the study area.

The general objective of this study is to analyse the factors that influence the participation of farm households' in watermelon production in some selected local government areas of Sokoto state.

This aim will be achieved through the following objectives

1. To describe the Socio-economic characteristics of farm households' in the study area.
2. To determine the level of participation of farm households' in watermelon production in the study   area.
3. To identify the factors that influences participation of farm households' in watermelon production in the study area.
4. To identify the constraints against full participation of farm households' in watermelon production in the study area.
5. To ascertain the sort of assistance required by the farm households' to achieve full participation in watermelon production of in the study area.

II.   MATERIAL AND METHODS

Description of the Study Area

This study was carried out in three local government areas of Sokoto State. The State is located between longitude 11^0 to 13^0 east and latitude 4^0 to 6^0 north. Sokoto State is bordered to the north by Niger republic, Zamfara State to east and Kebbi State to the south and west respectively (Sokoto state Government Dairy, 2014). The State however is made up of 23 local government areas (LGAs) these include: Binji, Bodinga, Dange Shuni, Gada, Gudu, Gwadabawa, Illela, Isa, Kebbe, Kware, Rabah, SabonBirnin, Shagari, Silame, Sokoto North, Sokoto South, Tambuwal, Tangaza, Tureta, Wamakko, Wurno, and Yabo. Out of the twenty three 23 local government areas (LGAs) 3 LGAs are selected as the outcome of preliminary survey as watermelon production areas. The areas are Isa, SabonBirnin, and Shagari. Sokoto State covered an area of approximately 35, 000 square kilometers with total human population of 4, 392,391 (Wikipaedia, 2015). The population of the people of the State is dominated by Hausa and Fulani people. Generally, over seventy five percent (75%) of the population of the state are farmers (Illiya et al, 2013). Furthermore, the farming activities in the state are divided into upland and lowland.

The upland farming is preferred during the rainy season and it accounts for most of the agricultural practices, where grains and legumes such as millet, sorghum, cowpea, and groundnut are commonly cultivated. In the lowland practices, less than 15% of the farmers are into fadama cultivation in which crops such as watermelon, onion, pepper, garlic, cassava and carrot are popularly cultivated (Illiya et al, 2013). The duration of rainfall in the state is between May and October within the mean annual rainfalls 600mm. However, the duration of the rainfall in the entire state is usually erratic, associated with periodic drought (Gwadabawa, 2007). The dry season starts from October to April, while the wet season begins between May/June. The harmattan which is dry, cold and dust laden wind arrives from December to February (Yabo, 2005).
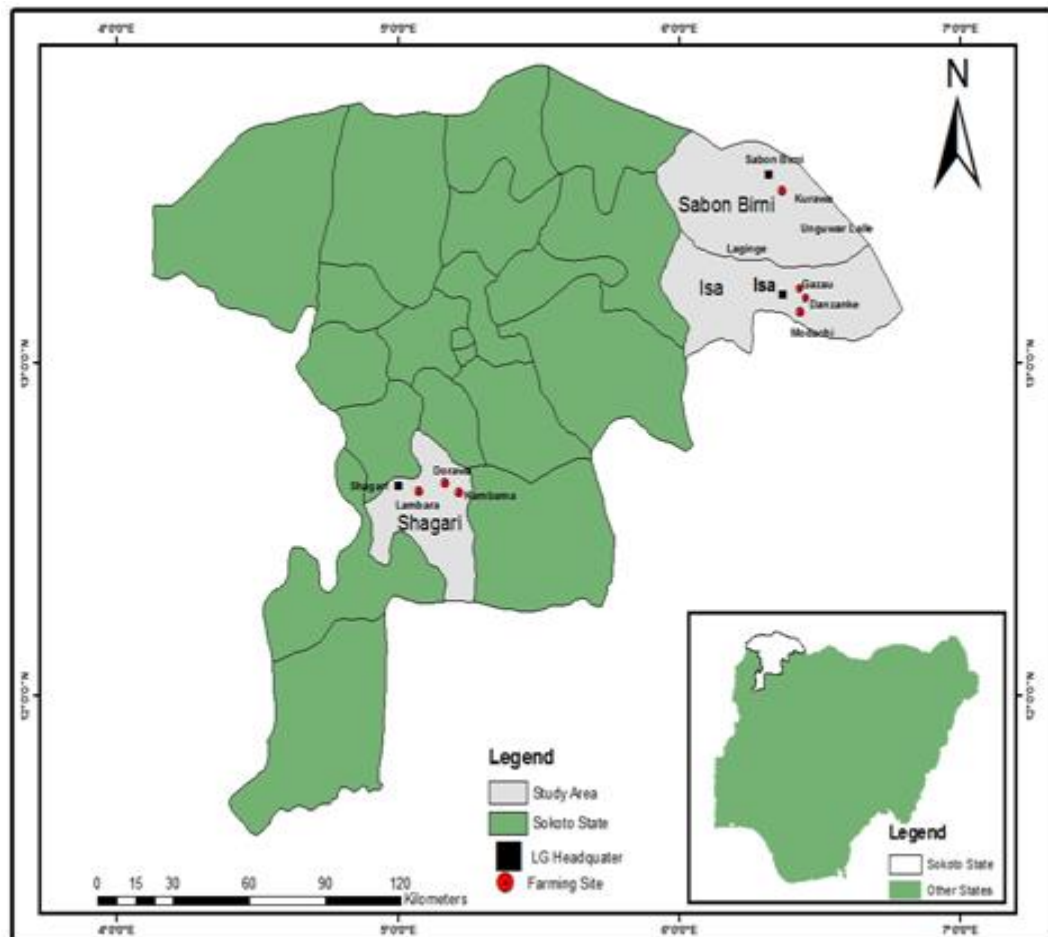
Source, GIS Lab, Department of Geography UDUS 2017
Figure ii: Map of Sokoto State showing the Study Areas

Sampling Procedure and Sample Size

The sample frame of this study constituted 1600 of farm households' from 27 watermelon producers association obtained from the Ministry of Agriculture, Sokoto State.

Multistage sampling techniques are used to select the farm households' of the study. The first stage is purposive selection of three 3 LGAs which are the major watermelon production areas (Reconnaissance survey, 2017). The areas are Isa, SabonBirnin, and Shagari. In the second stage, three villages where watermelon is produced in large quantities are also purposively selected. In the third stage, the population of the farm households' is obtained from the list of watermelon producers' association. In the final stage one hundred and eighty one (181) farm households' are used as a sample size of the study using proportionate random sampling from the list. The sample size of the study is determined by the formula developed by Yamane. Yamane (1967) as reported by Howell (2007)

$n = \frac{N}{1+N} \ (e^2)$

n = Sample size
N = Population
e = level of precision

Table 1: Sampling Procedure and Sample Size

Selected watermelon producing LGAs	Selected villages where watermelon is produced	Population of farm households'	Selected farm households' 7%
SABONBIRNI	Unguwa lLalle	240	27
	Kurawa	170	19
	Lajinge	180	20
ISA	Modachi	280	31
	Gazau	120	14
	Danzanke	200	23
SHAGARI	Lambara	150	17
	Dorawa	140	16
	Kambama	120	14
3	9	1600	181

Source: Field Survey, 2017.

Methods of Data Collection

Data for this study was obtained from primary source. The primary data is collected through the administration of questionnaire to the farm households' using interview schedule while, the secondary information is obtained from different sources that are found in textbooks, reviews, projects, journals, proceedings, and internet.

Methods of Data Analysis

The data collected from questionnaire administration is subjected to likert scale to achieve objective 2, while, objectives 1, 3, 4, and 5, is achieved using frequencies and inferential statistics and multiple regression analysis is used to test the hypothesis of the study.

Definitions and Measurement of Variables

The study considered two sets of variable, dependent and independent variables.

Dependent Variable

The dependent variable for the study is level of participation of farm households' in watermelon production and is measured in terms of farming experience in years, quantity produce per year in kilograms and income in Naira realised. The dependent variable is measured using a simple dichotomous response of and a 5-point Likert-type scale containing strongly agree, agree, undecided disagree, and strongly disagree to address the variable. The dichotomous responses are used to determine the level of participation of farm households' in watermelon production in the study area. The likert-type scale is used to determine the frequency of their farming experience, quantity realized and income generated in watermelon production. Therefore, the weighted score is used to multiply the scores on the likert scale to determine the Frequency of the level of participation.

Independent Variables

The independent variable includes the socio-economic characteristics of farm households' which are: - age, sex, marital status, educational status, households' size, farm size, and occupation.

Operationalization of Variables
Analytical Tools

Multiple Regressions:

$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 + e$

Where Y' = predicted value of Y (which is dependent variable).

β_0 = intercept

$\beta_1 - \beta_8$ are the estimated parameters.

X_1 = Age of the farm households' was measured in years.

X_2 = Sex of the farm households' is measured as 1, if male and 0 if female.

X_3 = Marital status is measured as whether the farm households' are married, single, divorced or widow.

X_4 = Educational level of the farm households' is measured based on the number of years spent in primary education, secondary education, and tertiary education.

X_5 = Households' size is measured as number of people in a households'.

X_6 = Occupation of the farm households' is measured as crafts, and trade for which one is regularly paid.

X_7 = Farm size is measured in hectares.

X_8 = Farming experience is measured by the number of years spent in watermelon production.

e = Stochastic term

Y = Participation is measured interns of farming experience in watermelon production, quantity produce and Income in naira realised in watermelon production.

Factors influencing Participation is measured based on income, parental influence and lack of preferable jobs.

Constraints of participation of farm households' is measured base on the constraints faced by farm households' such as lack of storage technology, market accessibility constraint, limited access to credit, pests and diseases infestation, Inadequate extension service, poor transportation, high cost of local inputs, lack of modern implement, unavailability of land and lack of improve varieties.

III.   RESULTS AND DISCUSSION

Socio-economic Characteristics of the Farm Households'

Sex of the Farm Households'

The table 4.1 indicates that majority 96.7% of the farm households' were male while only 3.3% of them were female. This is not surprising as the female saddle with domestic work, which requires their full participation coupled with the culture in the area. The finding collaborates with Muhammad et al, (2009) who opines that the males are dominating agricultural sector as compared to female.

Age of the Farm Households'

Table 4.1 reveals that most 55.8% of the farm households' falls under the age category of 24-30 years, farm households within this age bracket are considered to be at their active age. This is in line with the definition of international organizations such as the United Nations Youth Empowerment Strategy (2004) which reports that the active ages are those age between 15 to 29 years. The age bracket of 31-35 is reported to be 18.3%. The range of age of 36-40 and 36-40 is reported to be 20.0% and 3.90% respectively. Only 2.30% are within the age group of 45 and above.

Marital Status of the Farm Households'

The findings in table 4.1 reveals that the marital status of the farm households'. The highest frequency is 122 which show that 67.4% of the farm households' are married. About 32.0% of the farm households' are single. Only 0.6% is reported being divorced. It implies that majority of the farm households' are married.

Educational level of the Farm Households'

The findings on the educational level of the farm households' are analysed. This shows that 47.5% of the farm households' are said to have attained secondary education. The findings in this study also reports 26.5% to have attained non-formal education while tertiary and primary education accounts for 18.8% and 7.2% respectively. The attainment of such level of education can help the farm households to easily accept new innovations. This is due to the fact that education plays a very important role among the farm households as supported by the findings of (Amaza et al, 2003).

Farm Households' Size

Analysis in table 4.1 below reveals that most of the farm households' 40.9% have 6-10 individuals that live with them as a household 38.2% have 11-15 while 15.0% and 4.0 have 1-5 and 15-20 as the size of their households'. Only 2.3% have 20 and above as their farm households' size. More number of individuals in households' has positive impact on farm households' as it increases labour and reduces its cost. This is in line with the findings of Olaniyi et al., (2012).

Farm Size of the Farm Households'

The findings in Table 4.2 indicate that most 38.1% of the farm households' cultivate at least 1 hectare of land and only 1.1% of the farm households' are reported cultivating 5ha of land. Also, the study reveals that 11.0%, 6.1%, 24.3%, 0.6%, 11.6%, and 7.2% of the farm households' production 0.5, 1.5, 2, 2.5,3, and 4ha respectively. This implies that most of the farm households' are small scale producer which is one of the characteristics of Nigerian farm households'. Therefore, there is appreciable source of farm households' labour. This is in line with report of Bayacag (2001) that there is a positive and significant relationship between farm size and their production. Since the production of watermelon is not mechanized farm households' depend solely on human labour which is an important variable in watermelon production. The households' size determines the available labour force to be employed in carrying out production activities. The major source of labour supply in peasant farming system is labour-intensive, which is farm households' labour.

Farming experience in Watermelon Production

Table 4.2 reveals that most 54.4% are the Farm households' that have spent at least 6-10 years in watermelon production. It is also reported that 22.7% of the farm households' fall within 11-15 years as years of farming experience in watermelon production while 16.6% are within 1-5 years of farming experience. About 9.5% are 21 years and above and lastly 2.3% are within 16-20 years of farming experience. These findings are similar to that of Oladele (2011) who reported that experience in farming is important and it comes with years of practice.

Farm Households' Occupation

Most 54.7% of the farm households' have watermelon production as their primary occupation while 45.3% are civil servants. The implication of these findings is that if farm households' engage in production of watermelon as their primary occupation the chances of farm households' participating in the watermelon production will increase. This agrees with the finding of Muhammad et al (2009) who reported that farm households' who choose farming as their primary occupation has greater chances of participating in watermelon production.

    Table 1   Socio-economic Characteristics of the Farm Households'

Sex of the Farm Households'	Frequency	Percentage
Male	175	96.7
Female	6	3.3
Total	**181**	**100.0**

Age

Sex of the Farm Households'	Frequency	Percentage
24-30	101	55.8
31-35	33	18.3
36-40	36	20.0
41-45	7	3.90
46 and Above	4	2.30
Total	**181**	**100.0**

Marital Status

Sex of the Farm Households'	Frequency	Percentage
Single	58	32.0
Married	122	67.4
Divorce	1	0.6
Total	**181**	**100.0**

Educational level

Sex of the Farm Households'	Frequency	Percentage
Non-formal Education	48	26.5
Primary Education	13	7.20
Secondary Education	86	47.5
Tertiary Education	34	18.8
Total	**181**	**100.0**

Households Size

Size of the Farm Households'	Frequency	Percentage
1-5	27	15.0
6-10	74	40.9
11-15	69	38.2
16-20	7	4.0
20 and Above	4	2.3
Total	**181**	**100.0**

Source: Author's fieldwork 2017.

Socio-economic Characteristics of the Farm Households'

Farm Size	frequency	percentage
0.5	20	11.0
1	69	38.1
1.5	11	6.1
2	44	24.3
2.5	1	0.6
3	21	11.6
4	13	7.2
5	2	1.1
Total	**181**	**100.0**

Farming experience in Watermelon production

Farm Size	frequency	percentage
1-5	30	16.6
6-10	89	49.1
11-15	41	22.7
16-20	4	2.3
21and above	17	9.5
Total	**181**	**100.0**

Occupation

Occupation Farm Size	frequency	percentage
Primary Occupation Farming	99	54.7
Secondary Occupation (Civil Servant)	82	45.3
Total	**181**	**100.0**

Source: Author's fieldwork 2017.

Level of Participation of Farm households' in Watermelon Production

The result from the table as shown below shows farm households' perception on certain statements made to determine the level of farm households' participation in watermelon production. Item number 3 on the list which is ranked 1st indicates the income generated in watermelon production is satisfactory. This implies that the farm households' participation in watermelon is increased due to the fact that the income generated in the production is satisfactory.

Item 4 is ranked 2nd in the list. Farm households' perception here shows that their level of participation in watermelon production is low and not encouraging with a mean value of 2.33%. This implies that the farm households' have the perception that the income they generated from watermelon production deters their level of participation in watermelon production.

Distribution of Farm households' based on Level of Participation in Watermelon Production

Items	Score (point)	Mean	Standard Deviation	Ranking
Are you a full-time farmer in watermelon Production?	391	1.57	1.240	5th
Are you a part-time farmer in watermelon production?	460	2.19	1.168	3rd
Does the income you generated in watermelon production is satisfactory	468	2.36	1.179	1st
Does the income you generated in watermelon production is not encouraging	463	2.33	1.446	2nd
Does the quantity you produced encourages your level of participation in watermelon production	397	1.62	1.571	4th
Does your farming experience in watermelon production made me to participate more?	362	1.10	0.301	6th

Multiple responses   Source: Author's fieldwork 2017

Test of Hypothesis

The relationship between Farm households' Socio-economic variables and level of Participation in Watermelon Production. The table of coefficients shown below provides information on each of the predictor variable, information necessary to predict level of participation and socio-economic characteristics of the farm households'. The following multiple regression equation can be represented as:

Table 2:- Relationship between Socio-economic Characteristics of Farm Households' and their level of Participation

Variable	β Coefficients (Std. Error)	T	Sig.
(Constant)	-11784.874	-.098	.922
Age	11687.738 (4088.103)	2.859	.005**
Marital Status	17618.810 (32366.589)	.544	.587 NS
Sex	-4868.105	-.077	.938 NS
Educational level	62961.677 -4804.777	-.436	.663 NS
Households Size	11010.378 -5001.221	-1.762	.080**
Farm Size	2837.745 209433.384	14.108	.000***
Farming experience	2738.736 208644.454	-1.651	.060**
Occupation	14844.972 -5386.525	-4.390	.000***

Source: Author fieldwork 2017 $P < 0.001$***; $P < 0.05$**; $P < 0.01$*

Figures in parentheses stand for standard Error. NS=not significant

$R^2 = 0.78$ F-value= 84.222

Relationship between farm households' socio-economic characteristics and their level of participation in watermelon production is tested using multiple regression analysis. The result reveals a significant relationship between the farm households' participation in watermelon production and some of the socio-economic factors while other are not significantly related Age and households' size depict a positive significant relationship at 5% and 1% respectively. As age and farm size increases so also participation in watermelon production increases. This implies that older people with larger land holding tends to participate more in watermelon production.

Households' size and occupation of the farm households' depicts also a positive significance at 5% and 1% respectively. Farm households with more households' size tend to participate more than those with less number of households'. While those farm households' that produce watermelon as their primary occupation participate more than those that have other secondary occupations. This implies that farm households' that partake in watermelon production solely as primary occupation have more time to participate in watermelon production.

In relation with age, farm size and occupation bear significant relationship at 1% and 5%.The result simply that the farm households' participation in watermelon production have a relationship between the age, farm size and occupation. This indicates that the more the age of farm households' farm size and occupation in farming, the more the income and the more they participate. The finding therefore indicates that the null hypothesis is rejected because not all the socio-economic variables indicate significant 'relationship. The result further indicates that socio-economic variables such as sex, marital status, educational status, of the farm households' are significantly not related with their participation in the watermelon production. This is consistent with the findings of Adeoti and Olayemi (2003), they find out that increasing in age and farm size are expected to increase crop output of fadama farmers in Northern Nigeria. Olaniyi et al, (2012) in their findings report that there is a significant positive relationship between ages, farm size and output for garden egg production in AkwaIbom state, Nigeria. The coefficient of farm size is positive and statistically significant at 5%.

Constraints Faced by Farm households' in Watermelon Production

The table 3 reveals that lack of storage technologies is the most (68.5%) important constraints they faced. The farm households' also states high cost of inputs (66.3%) as another constraint that hinders their production. Lack of modern equipment, inadequate extension contact and market accessibility are other constraints faced by the farm households' as represented by 64.1%, 51.9% and 51.4% respectively. The results further describe pests and diseases,

lack of improved varieties, limited credit facilities, poor transportation and lack of technical knowhow as other constraints encountered by the farm households' as represented by 45.9%, 40.3%, 38.7%, 38.7% and 34.3% respectively. These constraints are virtually experienced in every agricultural sector in Nigeria and they need to be corrected. Nor and Madukwe (2000) report that increased agricultural production and enhanced farmers income are only attainable when effective agricultural inputs are put in place.

Table 3 Distribution of Farm Households' based on the Constraints they faced in Watermelon Production

Constraints Faced	Frequency	Percentage
Lack of Storage technologies	124	68.5
High cost of inputs	120	66.3
Lack of Modern equipments	116	64.1
Inadequate extension contact	94	51
Market inaccessibility	93	51.4
Diseases and Pests	83	45.9
Lack of improved Varieties	73	40.3
Lack of Credits facilities	70	38.7
Poor Transportation	70	38.7
Total	**843**	**465.8**
Multiple responses	Source: Author's fieldwork 2017	

Sort of assistance required by Farm households' to participate more in Watermelon Production

Table 4 also reveals the assistance that encourages farm households' participating more in watermelon production. Most of the farm households' believe that provision of subsidized agricultural inputs (63.5%) and market accessibility (63.5%) are the best assistance to encourage farm households to partake in watermelon production. Furthermore, provision of credit facilities (61.3%), provision of adequate extension contact 54.1% and modern implement 59.1% are what also encourage farm households'. Provision of adequate farm land 53.6% and good transportation network 52.5% are what also assist farm households'. Lastly the study reveals that provision of pesticides and insecticides and improved varieties are other ways to encourage households' as represented by 38.1% and 30.9% respectively. This finding implies that for farm households' to participate fully in watermelon production, the government needs to provide credit facilities, loans, market, transport and other factors that foster problem to farm households' participation. These are the major constraints that hinder the farm households' participation in watermelon production and as such need to be tackled by the government and non-governmental agencies. This is in line with Nor and Madukwe (2000) in their report that increased agricultural productivity and enhanced farm households' income are only attainable when an effective agricultural extension system, modern equipment, storage technologies are put in place to provide credit facilities and inputs.

Table 4.4 Distribution of Farm households' based on the assistances required to Participate more in Watermelon Production

Variable	Frequency	Percentage
Market accessibility	115	63.5
Provision of subsidized inputs	115	63.5
Provision of Credit facilities	111	61.3
Provision of modern implements	107	59.1
Provision of adequate extension Contact	98	54.1
Provision of adequate land	97	53.6
Provision of transport facilities	95	52.5
Provision of Pesticides	69	38.1
Provision of improved varieties	56	30.9
Total	**863**	**476.6**
Multiple responses	Source: Author's field work 2017	

IV.   CONCLUSION AND RECOMMENDATIONS

Conclusion

Conclusively; the aged group 24-30 years participate more in the production of watermelon Furthermore, multiple regression analysis reveals significant relationship at 1% between level of participation in watermelon production and the farm households' farm size, household size. However, lack of storage technologies, lack of modern implements and high cost of inputs are some of the constraints faced by farm households'. Participation of in this context is capable of addressing high rate of unemployment in the study area. It also increase high rate of income for sustainable development. The results imply that the farm households' participation in watermelon production has a relationship with their farm size and farming experience in watermelon production. Therefore, the more the farming experiences in watermelon production the more their income and the more the participation.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. It is recommended that government and donor agencies should encourages farm households' providing them with the modern agricultural inputs so as to influence them to participate fully into watermelon production irrespective of their Socio-economic differences

2. It is recommended that farm households' should participate fully in watermelon production so as to carter for their needs.

3. It is recommended that government should provide alternative sources of income so as to influence participation of farm households' into watermelon production.

4. It is recommended that watermelon processing and storage technologies should be put in place, so as to avoid the incidence of losses.

5. It is recommended that government and non-governmental agencies should stimulate participation in watermelon production by providing trained agricultural extension staff.

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