Research Article **AJAR (2016), Vol. 1, Issue 01**

American Journal of Agricultural Research (ISSN:2475-2002)

Factors Affecting Sustainability Of Melon (Egusi) Production In Rural Farming Households Of Southwest, Nigeria

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ABSTRACT

Melon crop plays important roles in the farming system and in the nutritional diet and economic well-being of West African rural dwellers. However, there has been continuous decline in the melon yield in last two decades. Also, cultivation of melon is not without challenges like every other arable crop in southwest Nigeria. Hence, this paper focused on factors affecting melon (egusi) production in rural farming households of southwest, Nigeria. Multi-stage sampling technique was used in selecting 108 respondents from twenty villages in three LGAs of Oyo State, Nigeria. Primary data were collected using interview guide and analyzed using descriptive statistics and multiple regression analysis. Results showed that 80.10% of melon farmers were males and 87.04% were married with a mean age of 41 years. Many (47.20%) of the melon farmers did not have formal education while 36.10% attended primary school. The mean year of farming experiences was 16 years. The farmers cultivated melon seeds obtained from their previous harvest (81.0%) and purchase seeds from the open markets (19.0%). Melon output declined from 376.53kg/ha in 2012 to 280.70kg/ha in 2014. Result of regression analysis showed that production input and socio-economic characteristics of the respondents (t = 0.19) have significant influence on melon output at $p < 0.05$. The study

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How to cite this article:
Oyediran, W. O., Omoare, A. M.and Ajagbe, B. O. Factors Affecting Sustainability Of Melon (Egusi) Production In Rural Farming Households Of Southwest, Nigeria. American Journal of Agricultural Research, 2016,1(1): 0001-0012.

Accepted 24 August 2016; published 24 August 2016.

eSciencePublisher
eSciPub LLC, Houston, TX USA.
Website: http://escipub.com/

concludes that melon yield is declining in the study area. Hence, it is recommends that extension agents should teach the melon farmers improved farming practices that can enhance higher productivity and better yield for sustainable melon production to be achieved in the study area.

Keywords:
factors, sustainability, farming, melon, rural households, production

Introduction

The need to increase and improve on the melon production in the farming system, human diets and health, diversify its uses in industries and other areas cannot be over-emphasized (Oyediran, 2013). The production of melon is constrained by low yield and little knowledge about its nutritive value (Bisognin, 2002). Melon is one of the most economically important vegetable crops worldwide and is grown in both temperate and tropical regions. Melon is a climbing herbaceous crop and has annual trailing vines with nearly round stems-bearing tendrils and circular to oval leaves with shallow lobes. Staminate flowers are borne in axillary clusters on the main stem, and perfect flowers are borne at the first node of lateral branches. Fruits vary in size, shape, rind characteristics, and flesh colour depending on variety. Melon is known as *Egusi* in Yoruba language found in tropical Africa and it is widely cultivated in West Africa (Nigeria, Ghana, Togo and Benin) and other African Countries for the food in the seeds (Achigan-Dako *et al*., 2008). Melon plays vital roles in the farming system and in the well-being of West African rural farmers as a good source of energy, weed suppressants and for soil fertilization. It is also used as mulch, leaving high residual nitrogen in the soil after harvesting. Cultivation of melon is sustained in southwestern Nigeria by its profitability as well as other socio-economic and cultural values. Production of the crop is more popular because of favourable weather and climatic condition as well as abundance of cultivable land which has made the practice of sole and mixed cropping possible in the region. The seed of melon is an excellent source of dietary oil (53.10%), high in protein (33.80%), and containing higher levels of most amino acids than soybean meal. Melon seeds contain between 30-50% by weight of oil and offer valuable sources of vegetable oil for local and export trade (Oloko and Agbetoye, 2006). The kernels are rich in fatty acids, minerals and proteins. Despite the socio-economic, cultural, agronomic and culinary importance of melon, productivity has been on the decline in recent time. The percentage yield declines in Nigeria from 103.26% in 2007 to 92.98% in 2008. The melon farmers are constrained by many problems including those of poor access to modern inputs and credit, poor infrastructure, inadequate access to markets, land and environmental degradation, and inadequate research and extension services. Also, there is no research on the effect of decline in melon output on rural households' livelihood sustainability in southwest, Nigeria where the melon is widely consumed in diverse forms, and there are scanty empirical studies of factors that impede melon productivity. Even then, smallholder and traditional melon farmers who use rudimentary production techniques, with resultant low yields, cultivate most of the degraded land. It is against this background that this study found it essential to assess and review melon based farming systems so as to enhance its productivity, profitability and sustainability among the rural households in southwest, Nigeria.

Specific objectives are to:

i. ascertain the personal characteristics of melon farmers in the study area

ii. identify sources of melon seeds planted by the respondents in the study area

iii. estimate production output of melon in the study area

iv. identify challenges to melon production in the study area

Hypothesis

Production input and socio-economic characteristics of the respondents have no significant influence on melon output (yield)

Review of Literature

Some of the factors affecting melon production sustainability in the rural farming households of Nigeria are:

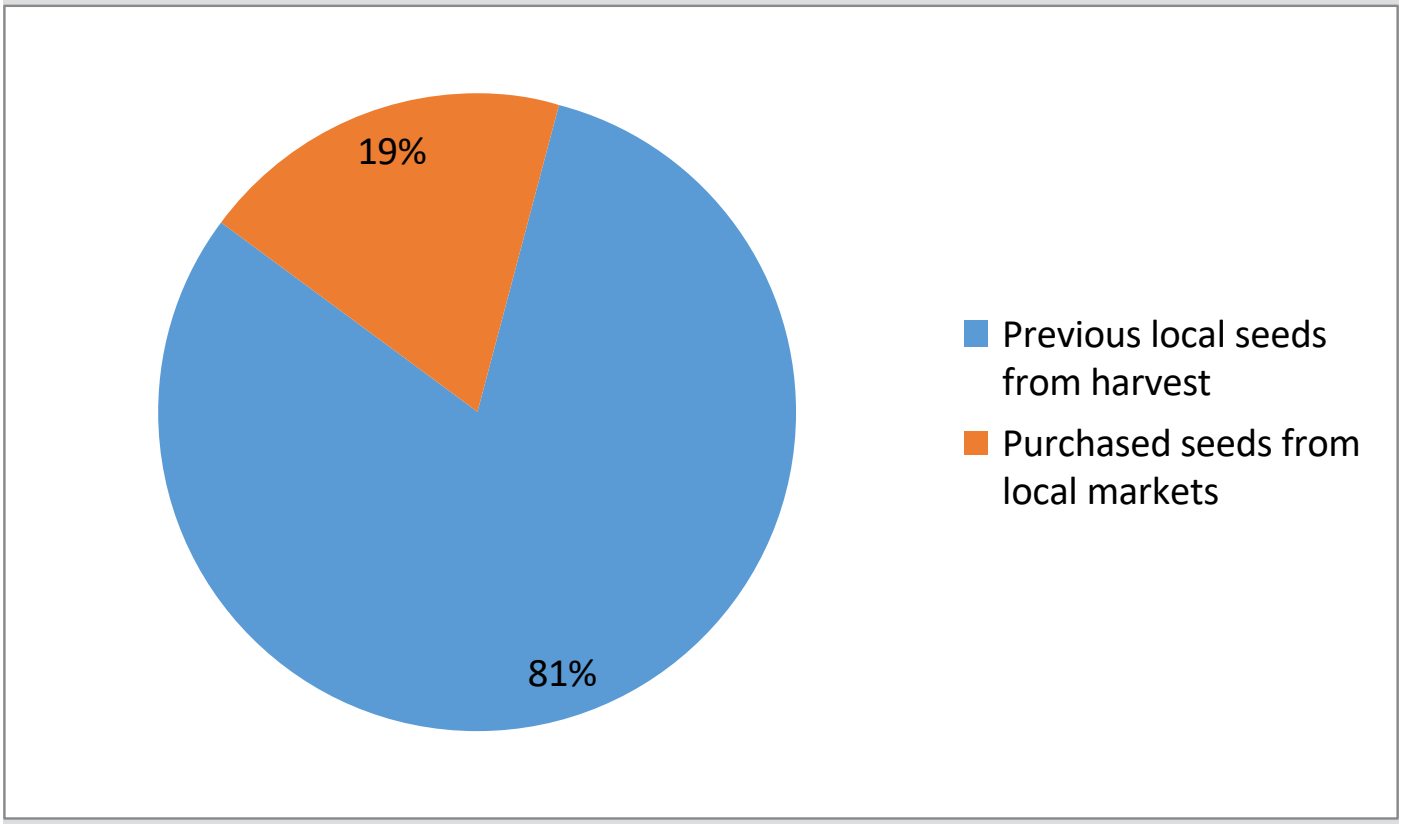

Figure 1: Distribution based on sources of melon seeds cultivated. Source: Field Survey, 2015.

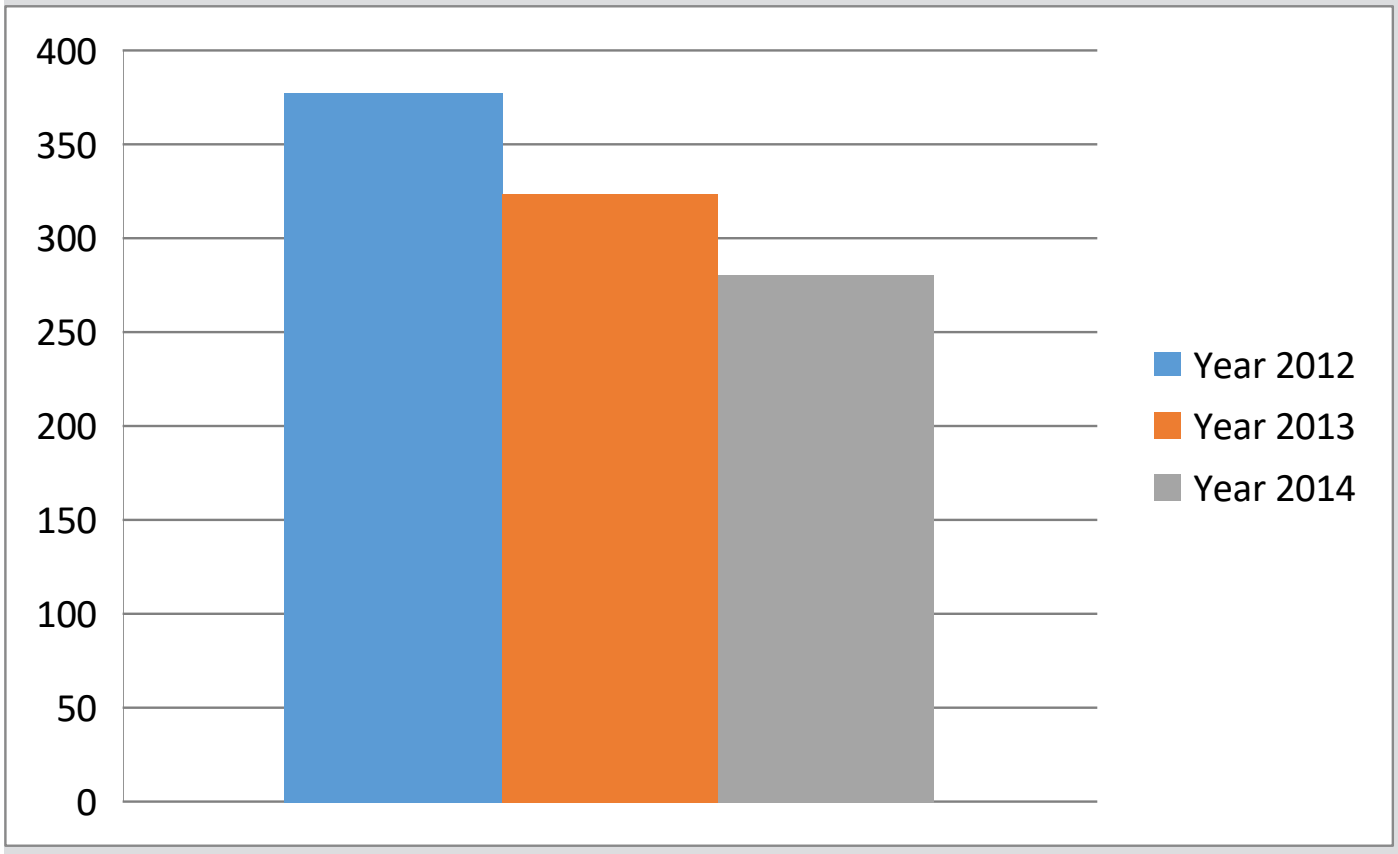

Figure 2: Distribution of respondents according to their melon yields (kg/ha) Source: Field Survey, 2015.

Socio-economic and cultural factors

Since the discovery of crude oil in early 1970s, Nigerians have been experiencing economic and social problems resulting in deteriorating living standards and conditions for most of the rural farmers. As incomes continue to decline, human survival has become more and more difficult. Most rural people have been affected in the areas of food security, health, sanitation, and access to quality education. Agro-ecosystems are influenced by household and market demands for various crops as well as culture, beliefs, customs, and economic and political systems. Unfortunately, in recent centuries material goals have been pursued at the expense of natural resources and social equity. The main factor affecting decisions by subsistence farmers is household needs, particularly food for home consumption. Multi-cropping systems have served this function in the gardens in southwest, Nigeria but their contribution to household diet varies from society to society (Gyuve, 2004). Decision making regarding crops and management of farm systems is influenced greatly by the degree to which farmers operate in barter, semi-cash, or cash economy. The volume of trade varies from household to household; some families sell their surplus products, while others are forced to sell subsistence products because of their greater need for cash. The alteration of farming systems from traditional and small scale mixed cropping to plantation or mono-cropping appears to have been the main focus of research until recently. When agribusiness was introduced to rural areas, land use, landholdings, and farm systems were changed in many respects. Consequently, mixed gardens have been replaced by cash crops that require intensive inputs into cultivation. Agricultural employment, farm management, and entire farming systems have adjusted accordingly. In traditional societies where agriculture is the predominant occupation, culture is formed largely through relations to plants, gardens, and agricultural fields. The major function of culture is to unite social relations among members of the same society who share similar beliefs, values, and patterns of behavior. For instance, a clan group can be established around a plant totem; members believe their ancestors originated from this plant and continue to live within it. In many cases, myths and folklore about how a village was founded have direct relationships with agriculture. Agricultural activities have a close relationship with festivals and ritual ceremonies during the calendar year; melon, yam, rice, bananas, coconuts, sugarcane, fruits, and other foods often constitute offerings on these occasions. Unfortunately, bulk of the melon use for home consumption and ceremonies in recent time are brought from Northern part of Nigeria to cushion the effect of decline.

Production factors

Land tenure system and land degradation

The fact that land is indispensable in every human activity, and its resources can be used in a variety of ways, has an especially crucial importance with relation to its usage for agricultural purposes. Land in an agricultural holding is a productive factor of a special kind since, unlike other goods used in the agricultural production process; it does not undergo the process of movement and increasing. Apart from this, in recent years because of developing non-agricultural sectors (especially construction) and the development of infrastructure, the process of excluding land from agricultural use has become more intense. As a consequence, the acreage of land for agricultural use is becoming more limited (Sikorska, 2008). Nowadays the process of converting agricultural land for non-agricultural needs (housing construction, motorways, industries, etc.) is becoming more noticeable. It should also be taken into account that agricultural production technologies undergo changes and the impact of the cultivated land's size on the scale of agricultural raw materials production is decreasing (Zagata, 2009). The economic sustainability of farming is considered in terms of production and the prospects for continued economic viability in the face of changing environmental, social and economic conditions. Considering this situation in marginal land, it seems that farmers are not willing to continue farming operations in an area if they perceive that the operations will not remain economically viable. The farm size is getting smaller due to urbanization into good quality agriculture land. Having smaller farm size means higher production costs and lower income. As the population swells and puts pressure on diminishing resources, increased environmental problems further threaten food production. Land degradation as a result of extensive agriculture, deforestation and overgrazing is already severe in many parts of the country. Declining productivity of land is a major source of worry for the farmers. The soils are generally of poor quality, lacking in important nutrients and easily prone to erosion. The situation led many farmers to diversify into cashew plantation while some moved into charcoal production business. In addition, group ownership restricts access rights of community mem-

bers outside the owning group, a situation that limits the use of land as collateral for agricultural credit. Inheritance leads to land fragmentation among future heirs, and subsequent uneconomic farm sizes per member. Subdivision of holdings among household members prevails as a consequence of the inheritance system. This may limit access to formal credit since the farmer cannot use land as collateral. It also reduces incentives to invest in land-quality maintenance and improvement. Because poor farmers cannot afford alternative farmlands nor have access to lands not inherited, they remain on depleted lands and further degrade resources. Thus, poverty and custom may constrain farmers' ability and willingness to mitigate land degradation, leading to declining productivity. Hence, access to quality agricultural land frustrated young melon farmers to quit farming and migrate to urban centres for alternative means of livelihoods.

Labour input in melon production

In Nigeria, where access to farm inputs and labour to control weeds are becoming increasingly scarce, many young farmers are abandoning farms in rural communities and moving to urban areas for white-collar jobs. The country's poor rural women and men depend on agriculture for food and income. About 90 per cent of Nigeria's food is produced by small-scale farmers who cultivate small plots of land and depend on rainfall rather than on irrigation systems (Enete *et al*., 2003). Both men and women play major roles in the production, processing and marketing of melon crop. The poorest groups eke out a subsistence living but often go short of food, particularly during the pre-harvest period. There are three primary types of agricultural labour in sub-Saharan Africa: family labour, exchange labour (*Aaro* or *Owe*), and hired labour. Family labour is the most common and most important source of agricultural labour in Sub-Saharan African (SSA), but is not always available in the right quantity or at the right time. In these cases, labour is found outside the household (hired). In some cases, household labour is allocated outside of agriculture because of other available income generating activities. If the family unit is unable to provide sufficient labour to meet the agricultural needs of the farm, the farm operator supplements through exchange or hired labour. Exchange labour, sometimes referred to as labour parties or groups, has historically been a common strategy for resource poor households to meet their labour demands. These exchanges are recruited through social networks and constituted under the assumption that the labour will be exchanged until the required task is completed on all land held by the participating parties. There is evidence that hired labour is becoming more prominent as competing non-farm employment has made labour exchanges more difficult to organize and drawn household members away from the farm. However, hired labour is used mostly by relatively more prosperous farmers, as poor households become net suppliers of labour (Ponte, 2000). The melon farmers therefore rely solely on family labour which in most cases is inefficient and may not readily available due to engagement in other non-farm activities.

Low Access to Agricultural Credit

Agricultural credit has for long been identified as a major input in the development of the agricultural sector, in Nigeria. In fact, the lack of adequate, accessible, and affordable credit is among major factors responsible for the systemic decline in the contribution of agriculture to Nigerian economy (Philip *et al*., 2009). Every segment of agricultural production requires the availability of adequate capital since capital determines access to all other resources on which farmers depend. It has been shown that farm level credit if well applied, encourages capital formation and diversified agriculture, increases resource productivity, size of farm operations, innovations in farming, marketing efficiency, value added and net farm incomes. The usefulness of any agricultural credit program does not only depend on its availability, accessibility and affordability, but also on its proper and efficient allocation and utilization for intended uses by beneficiaries (Oboh, 2008). In spite of the importance of credit in agricultural production, its acquisition, management and repayment are replete with a number of problems. The Nigerian Agricultural, Cooperative and Rural Development Bank (NACRDB) is one of the government publicly sponsored credit institution established since 1973 (formerly called the Nigerian Agricultural and Cooperative Bank) to cater for the credit needs of the agricultural sector. Unfortunately, the performance of NACRDB has been rated low. Also, access to agricultural credit has been positively linked to agricultural productivity in several studies. Yet this vital input has eluded small scale melon farmers in southwest, Nigeria. Cooperatives, friends, and family members dominate the sources of farm credit among the rural farmers in southwest Nigeria. Banks with large loan funds are generally difficult to access. Issues of collateral and high interest rates screen out most rural smallholders. Another problem associated

with small scale melon farmers' access to agricultural credit is that agricultural loans are often short term, with fixed repayment periods; this may not suit annual cropping, especially when loan release is not coordinated with growing cycles of crops. For credit to be most effective, loan terms must flexibly relate to cash flows in the target business, the input demand/supply structure, and quantifiable business risks.

Low Fertilizer Use

As elsewhere in Sub-Saharan African, low fertilizer use is a serious constraint to agricultural productivity growth in Nigeria, where fertilizer use averages 10–15 kg/ha (Philip *et al*., 2009). Majority of melon farmers in the southwest, Nigeria are not applying fertilizer to melon on the fields resulting in low yield. Between the late 1980s and mid-1990s, domestic fertilizer production as a percentage of the total supply varied from 46 to 60 percent. There has been no domestic production of fertilizers since the early 2000s because National Fertilizer Company of Nigeria (NAFCON), the dominant fertilizer producer in Nigeria, has been shut down. Some issues affecting domestic supply of fertilizers include high transport costs from port to inland destinations, poor distribution infrastructure, absence of capital for private-sector participation in distribution, significant business risks facing fertilizer importers, and inconsistencies in government policies (Africa Fertilizer Summit, 2006).

Limited sources of agricultural information to melon farmers

Over the years, rural farmers depend on indigenous or local knowledge for improved farming system/animal husbandry. Such knowledge (indigenous or local knowledge) refers to skill and experience gained through oral tradition and practice over many generations. Acquisition of such primitive skill by melon farmers has not helped to improve agricultural yield. Agricultural information are always meant to get to rural farmers via extension workers, community libraries, radio, television, film shows, agricultural pamphlets, state and local government agricultural agencies etc. Rural farmers in their effort to access these agricultural knowledge and information from available sources, for better farming system and improved agricultural yield, are confronted with certain constraints. Information is a fundamental resource for development. Agricultural information needs to be communicated to the melon farmers to promote and improve melon production in Nigeria. However, while agricultural information is important, equally of importance is the use of such information. The generation, processing and utilization of agricultural information on melon production are very necessary, especially to the end users (farmers) of such information.

The impacts of decline in food production on rural livelihood

The loss of food sovereignty and the dependence on food importation is making Nigeria quite susceptible to fluctuations in global food crisis. This is why Nigeria was also strongly affected by the global food crisis in 2007/2008. Nigeria's appalling food insecurity situation has degenerated to a level that it is listed among the 42 countries tagged "low-income food deficit countries" (Okunmadewa, 2003). Food insecurity disproportionately affects rural people particularly rural women, minorities and children. Studies have revealed that rural people face a high risk of food insecurity due to low agricultural productivity, poverty, income inadequacies, limited access to resources, and many barriers to self-sufficiency, which create family frailty and crisis. A nexus between food insecurity and poverty has been established. Similarly, it was revealed that one major characteristics of the farming populace of Nigeria is food insecurity, specifically in 2004, National Bureau of Statistic in its study on the relative poverty by occupation of household heads indicates that 67 percent of households whose heads engage in agriculture are poor and by implication lack the means to secure access to sufficient food at all time.

Materials and Methodology

Sampling procedure and sample size

The study was carried out in southwest, Nigeria. Oyo State was purposively selected. Multi stage sampling technique was used in selecting 108 respondents for this study. There are four major ADP zones in Oyo State namely; Ibadan/Ibarapa, Oyo, Ogbomosho and Saki. Ibadan/Ibarapa zone was purposively selected based on the prevalence of melon production by virtually every rural household in the communities (i.e. 25% of total zones). These areas are particularly known for horticultural crop production and a large percentage of the inhabitants are farmers (Oyediran, 2013). The second stage was random selection of three blocks which are Ibarapa East, Ibarapa Central and Ibarapa North LGAs from nine blocks in Ibadan/Ibarapa zone. In the third stage, a simple random sampling technique was used to select two cells from each of the selected blocks, making 10 cells.

Table 1: Distribution of respondents based on their personal characteristics (n=108)

Variables	Frequency	Percentage	Mean
Age (years)			
≥ 30	15	13.89	41.00
31 – 40	44	40.74	
41 – 50	32	29.17	
51 and above	17	16.20	
Sex			
Male	87	80.10	
Female	21	19.90	
Educational status			
No formal education	51	47.20	
Primary education	39	36.10	
Secondary education	16	15.30	
Tertiary education	02	1.40	
Farming experience (years)			
≥ 10	32	29.60	
11 – 20	49	45.40	16.00
21 – 30	18	16.67	
31 and above	09	8.33	
Farm size (ha)			
1-2	99	91.70	1.70
3 and above	09	8.30	

Source: Field Survey, 2015.

Table 2: Distribution based on problems reported on the field (n = 108)

Challenges	ES (3)	MS (2)	NS (1)
Water scarcity for removing the pulp from the seeds	70(64.80)	28(25.90)	10(9.30)
Cross-pollination between melon and watermelon	58(53.70)	12(11.10)	38(35.20)
Disruption and eating of developing pods by cattle	37(34.30)	19(17.60)	52(48.10)

Source: Field Survey, 2015. Please note, all the values in parenthesis are percentages. ES – Extremely Serious, MS – Moderately Serious, NS – Not Serious

The final stage was random selection of 40% melon farmers from each of selected cells through their association lists to make up a total of 108 respondents for this study. The instrument for the data collection was subjected to content validity test by consulting experts in the field of Agricultural Extension and Rural Development. Test re-test was carried out at interval of two weeks with twenty melon farmers who were not part of the study to ascertain the reliability of the instrument. A reliability coefficient of 0.82 was obtained using Pearson Product Moment Correlation (PPMC). Since the reliability coefficient of 0.75 and above is termed reliable, it is adduced that the instrument used for this study was reliable.

Measurement of variables and Data analysis

Age, household size, farming experience, and farm size were measured at ratio level while sex, educational level, marital status and occupational status were measured at nominal level. The estimated output was obtained for three consecutive years of cropping season 2012, 2013 and 2014. Data collected from this study were subjected to both descriptive statistics (percentage, mean and frequency distribution). All data on output were evaluated on hectare equivalent.

Results and discussion

Personal characteristics of respondents

The results of the analysis in Table 1 showed that the mean age of the respondents was 41 years. Most (83.80%) of the melon farmers were less than 50 years old revealing the presence of young and middle aged individuals that are known to be active and innovative. This result supports Oladoja *et al*. (2006) findings that most Nigerian farmers are within this age group and are economically active part of the population. Only few (16.20%) of the respondents were above 50 years of age. Majority (80.10%) of the respondents were males while only 19.90% were females. This indicates the dominance of male folk in melon production in the study area. This is attributed to the fact that men are more involved in cultivation and harvesting activities while women do the post-harvesting and marketing of melon. Odebode (2007) reports that adult males engaged in land clearing, planting and weeding while adult females carried out the seed selection and post-harvest practices in melon production. Most (47.20%) of the respondents do not have formal education while 36.10% attended primary school, 15.30% had secondary school education and 1.40% had tertiary education. This shows very low level of literacy in the study area which may in turn affect the rate of adoption of modern farming practices. Yahaya and Olajide, (2002) noted that educational level of farmers affected their preference for printed materials. The mean year of farming was 16 years. The result also indicated that 44.90% of the respondents had grown melon for less than 10 years while16.20% had been in melon cultivation for more than 21 years. This further shows that melon production is not a new farming practice to the people in the study area. As experience is gained over time, so the older the farmer, the more experienced his farming activities. The mean farm size was 1.70 hectare. Majority (91.70%) of the respondents cultivated 1-2ha while 8.30% cultivated more than 3ha. This shows that most of the melon farmers operated at subsistence level. This result is similar to that of Kolawole and Ojo (2007) that agricultural practice in Nigeria involves small scale farmers scattered over wide expanse of land area, with small holdings ranging from 0.5 to 3.0 hectare per farm land.

Sources of melon seeds cultivated

Also, the result indicated that all (100.00%) the respondents did not cultivate improved melon seeds as they relied on previous local seeds from harvest (81.0%), and as well purchased seeds from local markets (19.0%) to complement the available seeds. Improved melon seeds have never been introduced to the respondents and this may be adduced to the location of the respondents in the remote areas thereby hindering their accessibility to agricultural extension services.

Production output of melon (kg/ha)

The yields of melon for three consecutive cropping years: 2012, 2013 and 2014 were collected to know the trend of melon production in study area as shown in Figure 2. The average yield for the three consecutive years 2012, 2013 and 2014 were 376.53kg/ha, 323.95kg/ha and 280.70kg/ha respectively. The result of the yield contradicted the expected yields of 1100kg/ha in Nigeria as reported by van der Vossen *et al*. (2004). In recent time, the consequence of low productivity of melon is noticed in the Southwest region of Nigeria, as the large proportion of melon sold in the markets were brought from the Northern parts of the country to cushion the effect of the decline and as such melon marketing is gradually dominated by Hausas' men while the Yoruba women involvement in melon business is diminishing.

Problems reported on the field

From the results in Table 2, majority (64.80%) of the respondents reported that water scarcity was their major problem to melon production. This may be due to the fact that plenty water is required to wash the melon seeds after extraction from the pods. Most (53.70%) of the respondents also reported that cross pollination between melon and watermelon was a major challenge to melon production in the study area. The situation was reported to have bearing on the quantity and quality of melon seeds harvested. The introduction of exotic fruits and vegetables on the Africa continent had some negative impact on the consumption, domestication and cultivation of indigenous fruits and vegetables (Standing Committee on Nutrition (SCN), 2010). In the same vein about (34.30%) of the respondents indicated that Pastoralist cattle destroyed the melon vines and ate up the developing pods on their farms. This interference had led to loss of appreciable quantity of melon before harvest. Durojaye (2012) reported similar situation that led to attack of farmers in 10 villages in Orire Local Government Area of Oyo State.

Test of production input and socio-economic characteristics influence on melon output

Hypothesis 1: *Production input and socio-economic characteristics of the respondents have no significant influence on melon output (yield)*.

Double-log model (Cobb-Douglas model) was the lead model used in this study based on the best fit of lowest Durbin-Watson value 1.28, highest R-square (0.85) and highest F-statistic (324.52) significant at 1% level of significance just like the other models as shown in Table 3. The choice is based on considerations of signs of the coefficients with respect to economic theory (Gujarati, 2006). The highest R-Square indicated that 85.0% of the variation in output of melon in the sample was caused by variation in the explanatory variables used in the model. The coefficient of age was significant at 1% level of significance and positively signed ($t = 0.19$, $p < 0.05$). The positive relationship implies that the more experienced and energetic the melon farmers are, the more the output of melon would be. Also, sex ($t = 0.01$, $p < 0.05$) was significant at 1% level of significance. This could be attributed to the fact that men are more involved in melon production than women. Farm size was significant at 1% level of significance ($t = 0.99$, $p < 0.05$). This means that the more hectarage of land cultivated the more the output obtained by the farmers. Melon farmers with large farm sizes are more likely to produce more melon than their counterparts with smaller farms. This agrees with finding of Onoja and Achike, (2008) that the expected relationship between output and land is that, as more land is brought under production, output is increased. Ugwumba, (2010) reported similar results in traditional farming system that production output of staple crops respond to changes in sizes of the cultivated land area. Educational status ($t = 0.03$, $p < 0.05$) and farming experience ($t = 0.11$, $p < 0.05$) also returned positive signs at 1% level of significance indicating their relevance in enhancing melon productivity in southwest, Nigeria. Similarly, seeds cultivated ($t = 0.04$, $p < 0.05$) was significant at 1% level of significance with positive. This implies that, as long as the farmers continue to cultivate poor seeds, the yield will continue to decline. Thus, seeds have significant influence on the output of melon in the study area. It can therefore be said that age, sex, farm size, educational status, farming experience and quality of seeds cultivated have influence on melon production in the study area. The null hypothesis that "*production input and socio-economic characteristics of the respondents have no significant influence on melon output*" is hereby rejected.

Conclusion and Recommendations

In West Africa and southwest, Nigeria in particular where the melon crop is cultivated, information is lacking on the cultural background that contributes to the traditional farming system. The study concluded that production input and socio-economic characteristics of the respondents have no significant influence on melon production sustainability in the study area. The stagnation or decline in yield could affect the melon huge potential for food, income generation, and medicinal and industrial purposes which have not been fully utilized in Nigeria or make the melon goes into extinction. The decline in the production of indigenous melon crop calls for action. At this point, it has become very important that the agro-meteorologists should extend their weather forecast to melon farmers through extension agents as this will minimize the crop failure due to weather variation while government should subsidize the inputs (hybrid seeds, fertilizers and agrochemicals for melon); financial institutions and donors should collaborate with Nigeria government in providing sustainable financial sup-

Table 3: Factors influencing melon production (output/ha)

Variables	Linear	Semi-log	Double-log
Constant	-34.73	-2.75.92	-2.96
	(-0.70)NS	(-1.04)NS	(3.31)**
Age	1.05	37.44	0.19
	(4.81)***	(3.62)***	(5.43)***
Farm size	125.85	201.30	0.99
	(59.30)***	(47.49)***	(69.23)***
Sex	0.00	1.48	0.01
	(4.23)***	(1.64)NS	(2.87)**
Educational status	4.52	10.84	0.03
	(1.29)NS	(2.37)*	(2.03)**
Farming experience	33.55	52.75	0.11
	(2.71)**	(3.48)**	(2.17)**
Seeds	6.30	7.34	0.04
	(1.57)NS	(1.04)NS	(1.68)**
Constraints	-0.79	-39.61	-0.13
	(0.24)NS	(-1.58)NS	(-1.60)NS
Model Fit Tests			
R-square	0.81	0.80	0.85
Adjusted R-square	0.79	0.80	0.85
F-Statistics	211.90	167.01	324.52
Prob(F-Statistics)	(0.00)***	(0.00)***	(0.00)***
Durbin-Watson	1.32	1.51	1.28

Source: Field Survey, 2015. Please note, all the values in parenthesis are t - values.

*= significant at 0.10 level; ** = significant at 0.05 level; ***= significant at 0.01 level

NS = Not-significant at 0.05 level

port and make it readily available at the right time to melon farmers while extension agents should provide a platform for training on improved farming practices. All these interventions will go a long way to improve melon production and its contributions to rural livelihoods and nation economy at large.

Aknowledgements

My gratitude goes to Allah, the Almighty who is the source of my inspiration. My sincere thanks goes to Prof. (Mrs.) C. I. Sodiya, Prof. E. O. Fakoya and Prof. I. A. Ayinde for their mentoring and immense contributions to my academic progress. I have a very deep appreciation for my boss, a caring mother (Mrs. Modupe Adeosun) who inspired, trained, and encouraged me to study right from Abuja, Nigeria. My gratitude also goes to my loving wife, Mrs. Oyediran Bukola, and my entire family for their support to see the work successful. I appreciate my caring friend Dr. (Mrs.) A. M. Omoare for all her numerous effort and kindly support. I am very grateful to everybody that has contributed to the accomplishment of this research work.

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