



LEVEL OF PARTICIPATION OF TOMATO FARMERS IN ACTIVITIES OF AGRICULTURAL SERVICES AND TRAINING CENTRE (ASTC) IN JOS-SOUTH LGA OF PLATEAU STATE, NIGERIA

***ONUWA, G.C¹., ALAMANJO, C.C²., YITNOE, G¹ and ABDULLAHI, A.A¹**

¹*Department of Agricultural Extension and Management, Federal College of Forestry, Jos, Plateau state.*

²*Department of Agricultural Technology, Federal College of Forestry, Jos, Plateau State.*

***Corresponding author: onuwig@gmail.com (08035606473)**

Abstract

This study analyzed the level of participation of tomato farmers in activities of agricultural services and training Centre (ASTC) in Jos-south Local Government Area of Plateau state, Nigeria. The specific objectives were to identify the ASTC services available to the respondents; estimate the level of participation in ASTC services and identify the constraints to effective participation in ASTC services by the respondents. Multi stage sampling techniques was used to select 80 respondents for this study. Primary data collected were analyzed using descriptive statistics and Participation index. The results revealed that the tomato farmers in the study area participated in a minimum of one ASTC service so as to improve their overall farm productivity and increase their farm incomes. The results also revealed that most (56.25%) of the farmers had participation indexes of between $0.1 \geq 0.3$ indicating low level participation in ASTC services in the study area. The factors rated as significant constraints to participation in ASTC services include; poor access to credit (93.8%), inadequate capital (85%), inadequate input supply (78.8%) and cost of ASTC services (75%). It was therefore recommended that; improved access to agricultural credit, subsidization of input costs, efficient input supply, cooperative formation and improved agro commodity linkages are germane to mitigate this trend.

Keywords: Agricultural services, constraints of participation, participation index, tomato production, vegetable farmers

Introduction

Tomato is a versatile and widely grown vegetable throughout the world in nearly every home garden. Both wet and dry seasons cropping system contribute immensely to the national requirement, though bulk production is from the dry season cropping system grown yearly under irrigation. Nigeria is ranked the second largest producer of tomato in Africa and thirteenth largest producer in the World, producing 1.701 million tonnes of tomato annually at an average of 30 tonnes per ha (Business day, 2020). Tomato (*Lycopersicon esculentum*) is one of the most cultivated vegetable in most regions of the world, ranking second in importance to potatoes in many countries (Ojo *et al.*, 2009). This crop does not only contribute to the share of agriculture in national economy, but possess a great potential and comparative advantage to compete in the liberalized economy. Tomato has become an



important cash and industrial crop in various parts of the world. It is not only important as protective food and highly beneficial for the maintenance of health and prevention of disease, but also a source of livelihood for small scale farmers, food security of the people as well as foreign exchange earner for the national economy.

In Nigeria, areas of high production and concentration lie within the northern parts of the country. Vegetable production forms a substantial percentage of the major food crop cultivation in Nigeria. Tomato contributes to a healthy well balanced diet. Tomato fruits are consumed fresh in salads or cooked in sauces and soups. They can be processed into purees, juice and ketchup, canned and dried products. Agricultural techniques have remained rudimentary despite many years of works on technology generation and transfer by the Federal and State governments making Nigeria to still be a major importer of tomato because of its low quality, a lot of it gets wasted during peak period of harvest, difficult to cultivate at commercial level by many farmers due to vagaries of weather condition, decline in soil fertility, lack of improved planting materials, inaccessibility to credit facilities, high cost of fertilizer, pest and disease problems, and inefficient transportation network resulting in spoilage of output, inappropriate application of modern agronomic practices, un-protective type of tomato farming system, lack of capital, physiological decay, water loss, or sometimes simply because there is a surplus or glut in the market and no buyer can be found (FAO, 2012). Besides, in developing countries like Nigeria, storage, packaging, transport and handling techniques are virtually non-existent. Tomato has a limited shelf life and high glut during its short production season and become very scarce and expensive during its off season, its short life and inadequate processing and preservation leads to loss of revenue to the farmers. In recent years, the need to reverse the declining agricultural production has led the Federal Government of Nigeria and Plateau State government in particular, to embark on several agricultural policies and programmes some of which are defunct or abandoned, while others are still in place.

This ASTC project is aimed at ensuring farmers participation in different parts of the State so as to ensure all year round tomato production, sustainable increase in income of ASTC participants through the expansion of farm size with added value output. In the same vein, the government of Plateau State in 2008 entered into a joint venture agreement with an Israeli SEC company specialized in agricultural development and thus initiated and implemented the Agricultural Services and Training Centre (ASTC) intervention project, as an alternative approach, with emphasis on tomato production. The vision is aimed at agrarian reform through the introduction of modern farming techniques referred to as protective farming system, which could make tomato production attractive, create employment opportunities for the youths, and to prove that agriculture could serve as the nation's dependable and sustainable alternative source of income /revenue generation. Some of the activities carried out by the center or agency includes; provision of agricultural inputs, effective and efficient training of farmers on tomato production, modern agronomic practices on tomato production, use of net protective farming, provision of drip and family irrigation facilities, green house application style, efficient tractor hiring services and effective marketing channels for the products (ASTC Bulletin, 2012). However, very few empirical studies have been available to confirm the intended impact in Plateau State (ASTC bulletin 2012). This has constituted a gap in knowledge that needs to be filled making this study particularly imperative. Several literatures reveal that the reasons for failure of past development programmes were poor data base used for policy formulation (Bonigwe and Micah, 2013). This study is expected to



examine and provide valuable information on the impacts of ASTC technologies on the livelihoods of farmers. Also in many agricultural intervention programmes, the actualization of its objectives is a measure of the extent to which it has made impact on the beneficiaries or participating farmers. In relation to participation and adoption there are various determinants that positively or negatively contribute to participation and adoption of technologies, it is therefore necessary to identify specific determinants or factors so as not to generalize one mode of participation and adoption within a particular socio - cultural context. It is in view of this irrevocable fact that makes it imperative that studies on farmers' participation and adoption under different conditions or settings be undertaken to ascertain its peculiar determinants and so as to add to the existing adoption theory. Recommendation from this study will also serve as blue-print for policy makers researchers, extension officers and organization involved in agricultural development. This study is therefore significant to highlight how far the goals and objectives of ASTC project and its consequent impacts on the farmers' livelihood.

Problem Statement

Nigeria is currently facing serious food shortages to meet up the need of an increasing population. This has manifested in the declining per capita food production, decline of per capita income, growing food importation and accelerated ecological degradation. Vegetables in Plateau State have over the years been mainly produced during the dry season by irrigation farmers usually around low lying areas that are near stream channels. Most of these vegetables however become scarce and expensive during the rainy season. Despite Nigeria's rank of 2nd to Egypt in Africa and 13th position in the world hierarchy of tomato production, the country is still lagging behind in tomato production compared to Egypt and USA. Nigeria still imports 65,809 tonnes of processed tomato annually, worth over N11.7 Billion despite its massive local production (CBN, 2012). The yield of tomato in Nigeria is low, the average in guinea savannah zones of the country being only 20 tonnes per hectares (FAO, 2010). The global production area for tomato in 2010 was estimated at 444, 12757 ha with world production quantity estimated at 151,699,405 tonnes (FAO, 2010). However, the yield of tomato in West Africa, particularly Nigeria, is still not encouraging especially when compared to developed countries. For instance, Nigeria production was estimated at 1,860,600 tonnes in 2010 while the United State of America has an estimate for the same year as 12,858,700 tonnes (FAO, 2010). Yield per hectare in Nigeria was estimated at 1/7th of that of the USA (FAO, 2010). Besides, within the Africa context the estimated annual average yield per hectare of tomato in Nigeria is at 7.1 tonnes per hectare comparable to 39.5 tonnes per hectare for Egypt (CBN, 2012). This short fall necessitated the importation of processed tomato worth N11.7billion (\$75.5million) yearly. This makes Nigeria one of the primary importers of tomato globally and a major consumer of tomato paste, with only between 20%-30% produced domestically, 25%-50% of the import of this domestic paste is from China (CBN, 2011). Without adequate evaluation, one cannot be sure whether the objectives of the project were comprehensively achieved. It is in view of this that the study was conceived to answer the following research questions:

- i. What are the ASTC services available to the respondents?
- ii. What is the level of tomato farmer's participation in ASTC services?
- iii. What are the constraints to participation in ASTC services?



Objectives of the Study

The broad objective of the study was to analyze the level of participation of tomato farmers in activities of agricultural services and training Centre (ASTC), while the specific objectives were to:

- i. evaluate the ASTC services available in the study area;
- ii. examine the level of participation in ASTC services; and
- iii. identify the constraints to participation in ASTC services.

Methodology

The study was carried out in Jos-South local government area (LGA) of Plateau State, Nigeria. Its headquarters is located in Bukuru town on coordinates; latitude 9°46'N and longitude 8°48'E. It has a total land area of 510km² and a projected population of 306,716 at the 2006 census (NPC, 2007). Rainfall pattern is unimodal and ranges between 900mm - 1250mm per annum and average daily temperature is between 18°C - 22°C. The mean annual rainfall varies between 1347.5 and 1460mm per annum. The L.G.A has four (4) districts namely: Du, Gyel, Vwang and Kuru. The major crops grown are Tomato, Acha, Millet, Maize, Guinea corn and sweet potato among others and the livestock reared are goat, pig, poultry and cattle production. The major occupations of people in Jos South LGA are farming, civil service, mining and trading (NBS, 2012).

Multi-stage sampling technique was used in selecting the respondents in the study area. The first stage involved the purposive selection of Jos south LGA due to presence of the ASTC farm centre. The second stage also involved the selection of one district (Vwang) out of the four (Du, Gyel, Vwang and Kuru) districts in Jos south LGA due to predominance of ASTC participating farmers there. The third stage involved the collection of a compiled list of ASTC participating farmers from the ASTC farm center. The last stage involved the selection of a proportionate percentage of the total population from the compiled list to represent the sample size for the study.

Primary data were used for this study. The data were collected from participating farmers; using structured questionnaires and Focused Group Discussion with the assistance of local extension agents were also employed. The analytical techniques used for this study include descriptive statistics (frequency distributions and percentages) which was used to analyze the available ASTC services and constraints to tomato farmer's participation and Adoption index which was used to measure the level of tomato farmer's participation in ASTC services.

Model Specification

Adoption Index

The level of participation of tomato farmers in ASTC services was measured using the participation index. Adoption index were computed for individual farmers following Philip *et al.*, (2000); Wooldridge, (2002) whereby adoption index (Bi) is given by:

$$B_i = \sum (R_i/R_T) \dots\dots\dots (i)$$

Where:

- B_i = the participation index in ASTC services by i_{th} farmer;
- R_i = ASTC services the i_{th} farmer participated in; and
- R_T = Total number of ASTC services available to the i_{th} farmer.
- i = (1.....n)

For this study, participation in ≤ 3 services indicates a low participation index; participation in 4-7 services indicates a moderate participation index, while participation in 8-11 services indicates a high participation index. The following are the services of ASTC tomato programme; Input supply, agronomic techniques, net houses, irrigation farming, capacity training, market linkage, group/cooperative formation, Tractor services, agrochemical services, fertilizer services and storage services.

Results and Discussion

Types of ASTC Services Available to the Respondents

The results in Table 1 reveal that most (75%) of the farmers participated in the agronomic techniques package, followed by capacity training package (61.25%), market linkage package (58.75%), tractor services (42.5%) and input supply (38.75%). This shows that the farmers in the study area adequately participated in the different services of the ASTC project, hence several literature have also reiterated the fact that increased participation in agricultural services, technologies or services improves overall farm productivity. This corroborates with the findings of Nsoanya and Nenna, (2011); Okiki, et al., (2001) who also reported similar results.

Table 1: Distribution of Respondents Based on Available ASTC Services

ASTC services	Frequency	Percentage (%)
Input supply	31	38.75
Agronomic techniques	60	75
Net houses	17	21.25
Irrigation farming	6	7.5
Capacity training	49	61.25
Market linkage	47	58.75
Group/Cooperative formation	4	5
Tractor services	34	42.5
Agrochemical services	9	11.25
Fertilizer services	15	18.75
Storage services	10	12.5

Source: Field survey (2018).

Level of Participation in ASTC Services

The results in Table 2 reveal that most (56.25%) of the farmers have participation indexes of $0.1 \geq 0.3$ indicating low level of participation in ASTC services in the study area. This was followed by a participation index of $0.4 \geq 0.6$ (42.5%) and $0.7 \geq 1$ (1.25%) representing mid-level and high level participation in ASTC services respectively. The following are the

services of ASTC services in the study area; Input supply, agronomic techniques, net houses, irrigation farming, capacity training, market linkage, group/cooperative formation, Tractor services, agrochemical services, fertilizer services and storage services. Farmer’s participation is considered necessary to get community support for agricultural development services. This corroborates with the findings of Agwu and Agbala, (2010); Onu and Maduke, (2002) who also reported similar results.

Table 2: Distribution Based on Tomato Farmers Level of Participation in ASTC Services

Participation index	Frequency	Percentage (%)
0.1≥0.3(1-3services)	45	56.25
0.4≥0.6(4-7services)	34	42.5
0.7≥1(8-11services)	1	1.25

Source: Field survey (2018).

Constraints of Participation in ASTC Services

The result of Table 3 revealed that the constraints of adoption of potato production technology in the study area include; poor access to credit (93.8%), inadequate capital (85%), inadequate input supply (78.8%), cost of ASTC services (75%), Poor access to inputs (38.8%), and poor technical capacity (27.5%) significantly affected tomato farmers capacity to participate in ASTC services in the study area. This corroborates with the findings of Akpoko, (2004); Edi *et al.*, (2007); Tologbonse *et al.*, (2013) who also reported similar results.

Table 3: Distribution Based on the Constraints of Participation in ASTC Services

Constraints	Frequency	Percentage (%)
i. Poor access to credit	75	93.8
ii. Inadequate capital	68	85
iii. Inadequate inputs supply	63	78.8
iv. High Cost of ASTC services	50	75
v. Poor access to inputs	31	38.8
vi. Poor technical capacity	22	27.5

*= Multiple response

Source: Field survey (2018).

Conclusion and Recommendations

This study revealed a range of ASTC services in the study area. However, the level of participation in ASTC services among the respondents was generally low as indicated by their participation index. The farmers in the study area participated in a minimum of one ASTC project. The identified factors were significant constraints to tomato farmer's participation in ASTC services. It has been revealed from the study that participation level in ASTC services was generally low, thus, there is a great need to ameliorate these trend. Based on the findings of this study, the following recommendations are made for policy actions to improve the level of participation in ASTC services in the study area;

- i. Improved access to agricultural credit services in the study area should be encouraged.
- ii. Subsidization of input costs.
- iii. Improved input supply.
- iv. Ease of cooperative formation should be encouraged among the farmers for easy dissemination of agricultural innovation, information and capacity development.
- v. Establishment of well-organized markets and linkages between suppliers and farmers.
- vi. Increase the frequency of capacity training for the farmers to improve their knowledge and understanding on the risks and uncertainties associated with ASTC project.

References

- Agwu, A. E. and Agbada, M. O. (2010). Level of Farmer's Participation in the International Institute of Tropical Agriculture (IITA) Improved Spear Grass (*Imperata cylindrica*) Control Project in Benue State. *Journal of Agricultural Extension*. 14: 1-1
- Agricultural Services and Training Centres (ASTC) Bulletin, (2012). Agricultural Revolution in Nigeria.
- Ahmad, N. A., Fadhil, M. A and Taleb, R. A. (2012). Factors Influencing Adoption of Protected Tomato Farming Practices Among Farmers in Jordan Valley.
- Akpoko, J. G. (2004). Factors Affecting Adoption of Recommended Soil Management Practices for Sustainable Agriculture in Kaduna State, Nigeria. *Savannah Journal*. Ahmadu Bello University, Zaria. 19(2):27.
- Bongiwe, G. X and Micah, B. M. (2013). Factors Affecting the Productivity and Profitability of Vegetables Production in Swaziland.
- Business Day (2020); Retrieved 19-8-2021
- Central Bank of Nigeria, (2011). Integrating Nigeria's Agricultural and Financial Value Chains: The Role of NISARL. November 16, 2011. Retrieved from www.efina.org.ng.
- Central Bank of Nigeria (CBN), (2012). Harnessing Nigeria's Potential in Tomato Production-Nigeria. Retrieved from www.nigeriabestforum.com. Business and Economy.
- Edi, D. Paola, G. Ford, R and Samuel, T. (2007). Factors Affecting Farmer's Participation in Agric-environmental measures: A Northern Italian Perspectives. *Journal of Agricultural Economics*, Princeville publishes, Rome, Italy. 59(1):114-131.



- Food and Agriculture Organization (FAO), (2010). Global and National Tomato Production (Trade for Fresh Tomato-Code 0702000), Tomato News. Tomato Products Consumption.
- Food and Agriculture Organization, (FAO, 2012). Food and Agriculture Organization, online statistical database. Retrieved from <http://faostat.fao.org/>.
- NBS, Abuja. National Bureau of Statistics (2012). Socio-economic Survey on Nigeria. First Quarter Report, NBS, Abuja.
- National Planning Commission (NPC) (2007). Official Census Report, National Population Commission, Abuja, Nigeria.
- Nsoanya, L.N and Nenna, M. G. (2011). Adoption of Improved Cassava Production Technologies in Anambra East Local Government Area of Anambra. *Journal. Resources. in National Development.* 9(2): 36-42.
- Ojo, M. A. Ibrahim, O. A. and Mohammad, U. S. (2009). Profitability and Production Function of Small Scale Irrigated Tomato Production in Niger State, Nigeria *Continental Journal of Agricultural Economics.* 3:16-22.
- Okike., I, Jabar, M.A., Manyong, V., Smith, J.W., Akinwumi, J. A and Ehui, S. K. (2001). *Agricultural intensification and Efficiency in the West African Savannahs: Evidence from Northern Nigeria.* Socio-economic and Policy Research Working Papers. ILRI (International Livestock Research Institute). Nairobi Kenya Pp. 30.
- Onu, M. O. and Madukwe M. C. (2002). Adoption Levels and Information Sources of —Brood and Sell Poultry Operators. *Agro-Science. Journal of Tropical Agriculture, food, Environment and Extension.* AJORIND (2) December, 2011. ISSN 1596–8308. www.transcampus.org, www.ajol.info/journals/jorind43 publication of the Faculty of Agriculture, University of Nigeria Nsukka. 3(1):63-67.
- Philips, D., M. Masangwa and B. Philip, 2000. Adoption of maize and related technologies in the north-west Zone of Nigeria. *Moor J. Agric. Res.*, 1: 98-105.
- Tologbonse, E .B., Jibrin M. M., Auta, S. J and Damisa, M. A. (2013). Factors Influencing Women Participation in Women In Agriculture (WIA) Programme of Kaduna State Agricultural Development Project, Nigeria. *International journal for Agricultural Economics and Extension* ISSN: 2329-979. 1(7): 047-054.
- Wooldridge, J. M. (2002). *Econometric Analysis of Cross Section and Panel Data.* Cambridge: MIT Press, 2002.