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Farmers' perception and knowledge assessment in the adoption of SLARI-released improved cassava varieties - A case study of Moyamba and Bonthe districts of southern Sierra Leone

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Abstract
The study examined the perception and knowledge levels offarmers in adopting Sierra Leone Agricultural Research Institute (SLARI) released improved cassava varieties in Moyamba and Bonthe district of southern Sierra Leone. Sierra Leone Agricultural Research Institute has over the years developed and released 14 improved varieties of cassava to farming districts of Sierra Leone. Feedback from among the targeted farmers in relation to the level and amount of these technologies adopted will serve as worthwhile venture. To achieve that, four hundred and fifty (450)cassava growers were selected using purposive and random sampling methods. Data were analyzed qualitatively using descriptive statistic and probit.Results showthat knowledge level about the technology was moderate, while perception and adoption levels were high; with three of the varieties cultivated in the two districts. The study concluded that there should be outreach program made visible so as to enable the farmers to get a deeper understanding of introduced technology, thereby increasing their perception and subsequent adoption of the fully package of the introduced technologies.

Keywords: *cassava, perception and knowledge levels, SLARI/NARC, released varieties.*

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I. Introduction

Agriculture plays a unique role in reducing poverty through the use of new technologies (Adofu et al., 2013). The adoption of new agricultural technology such as the high yielding varieties (HYV) that led to the green revolution in Asia could lead to significant increases in agricultural productivity in Africa and stimulate the transition from low productivity subsistence agriculture to a high productivity agro-industrial economy (World Bank, 2008). In their view, Pender and Gebremedhin, (2006) related that agricultural productivity growth is becoming increasingly difficult without developing and disseminating cost-effective yield-increasing technologies to meet the needs of increasing number of people to expand the area under cultivation or rely on irrigation.In essence, low adoption of modern agricultural technologies amongst farmers could account for one of the main reasons for the low agricultural productivity and increase in poverty level. This view is shared with Meinzen-Dick et al. (2004) that '' No agricultural technology will have an impact either directly or indirectly unless farmers adopt it".

In the tropics, cassava (Manihot esculenta Crantz) ranks fourth after rice, sugarcane and maize as a source of calorie for human needs *(*FAO, 2010*)*.It serves as regional food source for about 200 million people (nearly one-third ofthe population) of sub- Saharan Africa (Abdoulaye et al.,2014).In Sierra Leone, cassava is the second most important food crop after rice, the staple (Samura et al., 2010). A fifth of agricultural household of Sierra Leone cultivate cassava, and considered it as the number two staple food crop after rice (Gboku, et al., 2017).

Over the years, especially post-war Sierra Leone, the Njala Agricultural Research Center (NARC), a constituent of Sierra Leone Agricultural Research Institute (SLARI), has been conducting various types of research activities on cassava in the country. These strides were mainly geared towards coming up with high-yielding, disease-free, drought-tolerant and consumer-friendly varieties for onward dissemination to smallholder cassava farmers in the country. Up to 14 varieties have been generated and released within the past several years. These varieties known as SLICASS (Sierra Leone Improved Cassava) have been widely disseminated in the country for end-user utilization. These strides are also to cushion the food security gap the country keeps grappling with. However, the high incidence of food insecurity and poverty among the rural people still persist, hence the need for increasing research interest on the county's key crop commodity; cassava, because of its potential to improve the diet and income of poor people. Several years after the introduction of improved cassava varieties, there is a dearth of empirical information on the level and extent of their adoption and use

intensity by farmers. Probably, several attempts have been made to investigate the factors determining the adoption of improved cassava varieties in Sierra Leone. However, the study area and empirical results may always differ.

By understandingfarmers andcommunity's perception and knowledge levelabout a technology will aid professionals in the research domain refine their agricultural technology outreach approaches to address the concerns of targeted communities.

Based on the forgoing, the research is anchored on the following objectives.

(i) Determine the socioeconomic characteristic of cassava farmers in Moyamba and Bonthe districts of Sierra Leone.

(ii) Assess the knowledge and perception of cassava farmers of improved cassava production technologies in Moyamba and Bonthe districts of southern Sierra Leone.

(iii) To determine the viability of the adoption of SLARI-released improved cassava varieties in the study area.

II. Methodology

Study Area

The study was conducted in both Moyamba and Bonthe districts of southern Sierra Leone. Both districts are characterized with coastal plains; with Bonthe located at both Island and mainland whiles Moyamba on mainland only (Figure 1).Both districts are identified as prominent cassava growing areas, and by extension its production serves as livelihood options for some farm families (Gboku, et al., 2017).

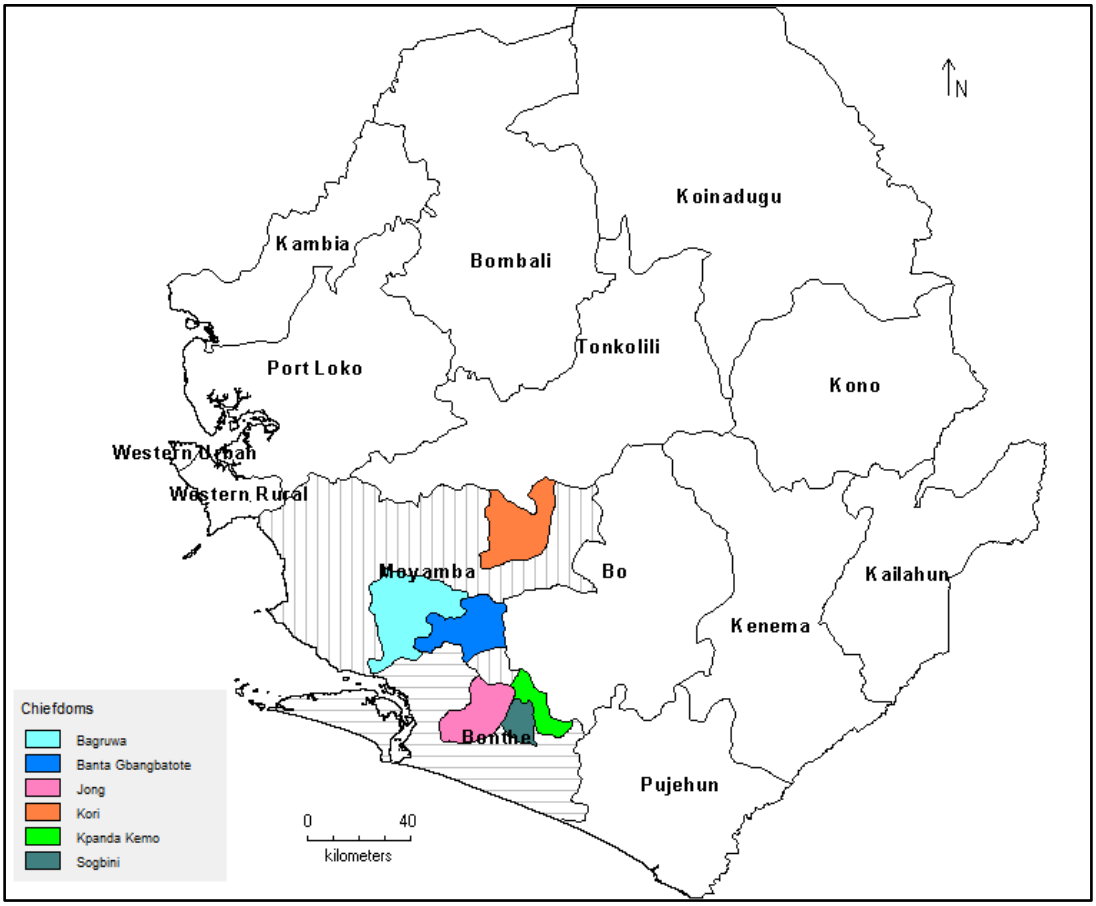

Figure 1: Map of Sierra Leone showing the study area (2 districts with chiefdoms)

Moyamba district was chosen because it hosts Njala Agricultural Research Center (NARC) whose mandate is to generate, develop and disseminate root and tuber crops in Sierra Leone. Comparing the perception and knowledge level of farmers in the adoption of released cassava varieties among farmers in these two districts within Sierra Leone will serves as a worthwhile venture. The research was a non-experimental design. It was exploratory in nature, thereby enabling the researcher to exhaustively explore the characteristic of cassava farmers in the two districts. The survey captured valuable information on several factors including household

composition and characteristics, land-use pattern, household assets, household membership, membership in institutions, other sources of income.

The population of the study constitutes smallholder farmers in the Moyamba and Bonthe districts. The sampling frame for the study comprises of cassava growers within the farming population. The study design is based on the multi-stage sampling procedure: the first stage involved the purposive selection of cassava growing chiefdoms within each district, the second stage involved purposive selection of cassava growing communities within each chiefdom and the third stage involved random selection of cassava growers within each community. Primary and secondary data were collected for this study: Primary data was collected through personal interviews with the use of structured questionnaires. About (450) individual cassava farmers were interviewed using android devices that were programmed withsoftware package of Open Data kit Collect (ODK). Secondary data was collected through desk review of scientific literatures. Data collected were analyzed using descriptive statistics and probit analyses.

III. Results And Discussion

Socioeconomic characteristics of respondents

About 74.7% of the farmers interviewed were male, while 25.3% were female (Table 1). This study is in agreement with Moranga, (2016) who conducted studies ontomato farmers in rural communities in Kenya, which findings revealed that farming in the country is predominantly undertaken by male farmers.

Table 1: Socioeconomic characteristics of cassava farmers

Characteristics	Frequency (n=450)	Percentage (%)
Gender		
Male	336	74.7
Female	114	25.3
Age category		
18-35 (youth)	117	26.0
36-55 (adult)	235	52.2
56 and above (aged)	98	21.8
Educational level		
Informal	186	41.3
Koranic	65	14.4
Primary	74	16.4
Junior secondary school (JSS)	71	15.8
Senior secondary school (SSS)	34	7.6
Tertiary	20	4.4
Land acquisition		
Gift	25	5.6
Inheritance	247	54.9
Purchase	36	8.0
Rent	142	31.6
Source of labour		
Community help	6	1.3
Family	15	3.3
Hired	284	63.1
Rotary group	145	32.2

Source: Survey data (2019)

Some view this imbalance in gender based on the economically lucrative nature of a particular farming enterprise (as compared to other farm enterprises) which tend to attract men into the business''

This however contradicts the findings of Akinnagbe et al. (2008) and Nsoanya and Nenna (2001) who asserted that women are the backbone of agricultural sector and agricultural production. In rural communities of Sierra Leone, it is interesting to note that more male present themselves or are referred to as farmers when situation present itself. Others are of the opinion that male members among other things mostly own the farming lands, poses as household representative (heads) and hence decision makers. Male dominance serves as status symbol and engender household security.

Data also revealed that 52.2% of the farming population are adults, with more energy and experience. This finding is in agreement with work conducted by Afolami, et al (2015), that majority of the cassava farmers interviewed are in their active years (adults), with an advantage of transferring innovation that enhance farm productivity. In addition, Hassan &Nhemachena, (2008) posit that age positively correlates with farming experience, and therefore, the older a farmer is the more likely he is to adapt to the technology

Because majority (48.4%) are not associated with farming groups, farmers are likely to be deprived of the benefit of association to social belongingness. According to Atieno, (2001), the primary motivation for belonging to a group is that it offers farmers the opportunity to obtain credit. For Lawrence (2015), many

financial institutions have evolved and require borrowers to be in groups in order to be given loans thereby enabling the lenders to reduce the problem of adverse selection. Group membership also serves as a form of collateral by providing necessary peer-reference for lenders in ascertaining a borrower's credit-worthiness

Above 70% of the farmers could not access secondary and higher levels of education (Table 1). Oluwasola (2010) stated that the low level of education among the respondents could have serious implications on their ability to access information, use new technological innovations and even access or get credit from formal financial institutions. Some also argue that the characteristic of a technology is a precondition of adopting it. Trialability or a degree to which a potential adopter can try something out on a small scale first before adopting it completely is a major determinant of technology adoption (Doss, 2003). About half (54.9%) of farmers access or owned land by means of inheritance (meaning acquire it through family members) from generation to generation, 31.6% through rental means, 8.0% by paying in cash or kind to either utilized or owned it and 5.6% by gift. This means that family connection and influence contribute greatly towards the success of farm families. This study is similar to finding of Acheampong P.P., (2015) who observed that the traditional and customary concepts of land ownership that still prevail in the study areas. That land acquisition is mainly through inheritance whereby farmers indicated that their lands were either handed down to them or were family lands.

In the study area, hired labour (63.1%) and rotary group (32.2%) serves as the two main sources of labour in cassava crop cultivation. This group of cassava growers could likely account for a large proportion of farmers that goes in for hired labour. In most cases, farmers who go in for larger farms; hire service or rotary groups can be the best option for efficient and timely cultivation especially when it involves activities like brushing, planting, weeding and even harvesting, etc

Farmers Perception of improved cassava traits in study area

Farmers were asked to rate or give opinion about the different parameter relating to the improved cassava technologies for their decision making (Table 2).

Table 2: Perception score of farmers about improved cassava technology

	Perception parameter of improved cassava production	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
1	Cost of growing improved variety is higher compare to local variety	4.2	1.1	41.8	48.0	4.9
2	Improved cassava varieties do not satisfy me as a farmer	1.0	4.4	10.0	55.3	29.3
3	Disadvantages of growing improved variety will outweigh the advantages	1.3	1.3	32.7	50.4	3.3
4	Improved varieties have higher yield than local variety if managed properly	52.9	42.6	2.2	2.0	0.3
5	Improved varieties are not accessible	2.9	10.9	41.7	45.8	2.9
6	Improved varieties grow and mature faster than local varieties	28.0	38.0	30.9	3.1	0.0
7	Improved varieties have better taste than local varieties	4.4	4.4	33.8	**52.7**	4.7
8	Improved varieties have more pleasant smell when compared to local variety	3.3	13.3	33.6	**49.3**	0.4
9	Improved varieties is more resistance to diseases especially (CMD).	**50.7**	38.7	5.3	3.3	2.0
10	Not yet aware about SLICASS varieties	4.2	4.2	28.4	**45.8**	2.2
11	Good agronomic practices would increase the productivity of improved cassava type.	43.2	46.2	5.8	3.5	1.3
12	Cost of local variety material (cutting) is cheaper	2.7	42.7	29.3	20.0	8.0
13	Improved cassava has high resistance to pests, and drought conditions	10.6	25.1	46.0	11.3	6.7
14	Local varieties are easy to process into multiple products	27.3	27.3	38.9	6.2	0.3
15	Practicing the cultivation of improved cassava farming is a good idea	35.1	63.1	1.0	0.8	0.0

Source: Survey data (2019)

According to Guillem and Barnes (2013), it is important to ask questions about general farming as a general context to assess its importance in the balance of decision-making. In some way, farmers' perceptions about new technologies or research commodity can influence their level of adoption in real times. Their views about those technologies can also generate a balance feedback to the research domain for concrete reaction.

Data also revealed that most farmers (48.0%) could not agree that the cost of growing improved cassava varieties surpasses local types, neither do they accept the notion that it does not satisfy them as farmers (55.3%), nor do its production cost outweigh local types (Table 2). They also strongly agree to the opinion that improved variety yield (52.9%) better, as it grows and mature faster. Even though some were of the view that

access to planting materials of the technology is easier (45.8%), but some farmers were not sure (41.7%). They could also not oppose to neither the taste nor the smell of the new varieties. For them, its resistance to diseases such as Cassava Mosaic Disease (CMD) is agreeable, but for pest and drought they are not sure (46.0%). Despite, many (38.9%) were neutral of the opinion that improved types can better process into multiple products, some agreed and many more agreed strongly in equal percentage (27.3%) respectively (Table 2).

Extract from the perceptions (Table 3) indicate that half (50.2%) of the cassava farmers in the survey areas have high (very good) perception about the improved cassava varieties diffused in their communities for evaluation and possible adoption. Closed to half (48.7%) have fair (judgment) appreciation and acceptability for the technology. Implying that, the technology has promising tendency of being adopted.

Table 3: Summary of perception level of farmers

Rating the perception level of farmers	Frequency	Percentage
0.17-0.24 (Low)	5	1.1
0.25-0.30 (Medium)	219	48.7
0.31 and above (High)	226	50.2
Total	**450**	**100.0**

Source: Survey data (2019)

Knowledge of farmer on improved cassava technology

According to Rogers (1995), literature on agricultural innovation asserts that awareness and knowledge of a new technology is the first step in the adoption process. As Azman et al., (2013), put it 'knowledge enables farmers tounderstand how to apply good agriculture practices'. From Table 4, majority (67.1%) of the farmers have moderate knowledge, 18.9% with low knowledge and 14.0% have high knowledge of introduced improved cassava technology.

Table 4: Summary of knowledge of farmers about technology

Rating the knowledge level of farmers	Frequency	Percentage
0.28-0.35 (Low)	85	18.9
0.36-0.45 (Medium)	302	67.1
0.46 and above (High)	63	14.0
Total	**450**	**100.0**

Source: Survey data (2019)

In a study by Hothongeum K., et al (2014), where knowledge test was used about Tailor-made Fertilizer, in which the parameters low, moderate (medium) and high were used, more than half of the farmers had moderate level of knowledge of the technology (TMF). Indicating that, based on the of the farmers experience in the cultivation of the crop, couple with information from farmers and other sources have given them fair knowledge with regards the management of the crop. It also suggested that more need to be done to increase the farmers knowledge to higher level.

Adoption of Sierra Leone Agricultural Institute (SLARI) improved cassava varieties.

In this study, an adopter is defined as a respondent that had grown at least one of the introduced improved cassava varieties for at least one season prior to year 2019 and had the variety on his farms in the year 2019. Over the years, Sierra Leone Agricultural Institute (SLARI) through one of its unit (Njala Agricultural Research Center) and in collaboration with Ministry of Agriculture and Forestry (MAF)has generated and disseminated up to 14 improved cassava varieties throughout the country. Data on the reachability and utilization of this research commodity will be to a larger extent useful information for current research domain.

Table 5: Respondents by types of technologies adopted

Technology	Frequency	Percentage
Improved cassava planting materials	421	93.6
Ecology	353	78.4
Cutting spacing (1M x 1M/0.8M)	194	43.1
Weeding (2 times)	417	92.7
Planting method (1 cutting per hole/hill)	53	11.8
Use of fertilizer	19	4.2
Pest and disease management	194	43.1
Planting method (row)	16	3.6

Multiple responses. ***Source: survey data (2019).***

In Table 5, more farmers (93.6%) have cultivated the right planting materials, adapting to the right ecology (78.4%), and adhering to appropriate weeding regime (92.7%) in cassava cultivation. However, adoption level is lower in the area of number of cutting per hill/hole, pest and disease management, etc.

In Table 5, many (93.6%) farmers access the planting materials, cultivate in the right ecology (78.4%), adhere to the weeding regime (92.7%). They however, grapple with row planting, number of cuttings to be planted per hole/hill, improve strategies for pest and disease management, etc. In a study conducted by Mkamilo and Jeremiah (2005), asserted that the majority of farmers in Tanzania were still confined with traditional technologies such as use of local planting materials, improper spacing, no fertilizer application, land preparation, weeding and traditional cassava processing. Doss et al. (2003) mentioned several reasons for farmers not adopting improved technologies in maize and wheat; unaware or misconception of technologies, farmers did not understand the benefit of the improved technologies.

Table 6: Reason for selecting Improve cassava varieties (SLICASS varieties)

Two reasons why prefer SLICASS variety 1-14	**Frequency**	**Percentage (%)**
High yielding and quality root	394	43.7
High dry matter for quality gari for market	92	10.2
Vigorous growth & Early maturity	56	6.2
Malleable & Good taste (palatability of root)	62	6.9
Easily processed into vegetable (leaf)	22	2.4
Resistant to pest and diseases	26	2.9
Good for food	106	11.7
Job & High income & family welfare/support	142	15.7
Total	**900**	**100.0**

Multiple choice. *Source: Survey data (2019)*

Data from Table6, shows that farmers who opt for improved cassava varieties have reasons ranging from its yield qualities and quality root (43.8%), because the enterprise create job opportunities that provide income which them to take care of their families (14.9%), its good quality products when process into different food stuff. Furthermore, for its high dry matter and quality market value gari, which earn them income is also evident in the data. Its vigorous growth and fast maturity especially for family food security was also considered.

Table 6 highlights three things. First, there are four key factors that influence adoption: cost (both the cost of the technology and the impact it has on income); efficacy (that the technology is useful or creates efficiency); ease of use; and risk (Rogers 2003).The SLARI improve cassava varieties resonate to the characteristics. Farmers acknowledge its high-yielding potentials, with a tendency of producing marketable gari when processed. Similarly, Asiedu-Darko (2013) found that farmers easily adopt technologies with traits associated with their own traditional practices.

In the table, Pearson moment bivariate Correlation was used to analyze the test relationship between knowledge and adoption of technologies by cassava farmers since the data was normally distributed. From the result, there is no significant relationship between knowledge of cassava farmers and the adoption of cassava production technologies. This means that at a probability ($P<0.01$) value, there is no significant correlation between knowledge and adoption of cassava production technologies. In addition, the table also shows that there is a significant strong positive relationship between knowledge and perception of cassava production technologies. This means that as knowledge of farmers' increases, perception of farmers in cassava production technologies also increases at a probability ($P<0.01$). Moreover, the table further shows that there is no significant relationship between adoption of cassava production technologies and the perception of farmers in cassava production at a probability value of ($P<0.01$).

Table 7: Comparing farmers knowledge, perception and adoption levels of cassava production technologies

Correlations				
		Knowledge Level of Farmers in Cassava Production Technologies	Adoption Level of Farmers in Cassava Production Technologies	Perception Level of Farmers in Cassava Production Technologies
Dependent Variable: Knowledge Level of Farmers in Cassava Production Technologies	Pearson Correlation	1	.060	-.130**
	Sig. (2-tailed)		.203	.006
	N	450	450	450
Dependent Variable: Adoption Level of Farmers in Cassava Production Technologies E	Pearson Correlation	.060	1	-.030
	Sig. (2-tailed)	.203		.524
	N	450	450	450
Dependent Variable: Perception Level of Farmers in Cassava Production Technologies	Pearson Correlation	-.130**	-.030	1
	Sig. (2-tailed)	.006	.524	
	N	450	450	450
****. Correlation is significant at the 0.01 level (2-tailed).**				

Source: Computed from Field Survey 2019

IV. Conclusions And Recommendations

Majority of farmers have fair or moderate understanding of technology and the information surrounding its cultivation for optimal yield. However, there still remain some knowledge gap in the area of number of cuttings to be planted per hole/stand, fertilizer/nutrient management, pest management, row versus random planting, etc. About half of the farmers have high level of perception about the technology, believing that the crop can fulfilled their sole desire of increase productivity, thereby improving on their income level and livelihood sustainability. In addition,farmers adoptedsome component of the improved cassava technology package. For obvious reasons, adoption was extensively based on trialability, characteristics of the commodity, experience of adopters and promising nature of the crop. Because majority of the farmers acquire land through inheritance, access made it possible for them to crop at will. Even though hired labour was prevalent and most times available, especially for activities like land preparation, weeding and harvest, etc., the cost of labor per man-day poses some challenges. Findings also shows that as knowledge of farmers' increases, perception of farmers in cassava production technologies also increase at a probability ($p<0.01$).

POLICY RECOMMENDATIONS

As a way of policy suggestion:

The government through the Ministry of Agriculture and Forestry in collaboration National Research System and other partners to review and establish a robust extension system, which enables farmers to access developed and released improved cassava varieties. More effort should be made to enable the farmer get a deeper understanding of introduced technology, thereby increasing their perception and subsequent adoption of the fully package of the introduced technologies. This will then improve their livelihood through increased income through marketing of the crop.

More vibrant outreach program to promote released and improved cassava varieties with associated information to unleash its fullest potentials in farmers' field. Suggestion for future studies is recommended in areas of cost benefit analysis of production per hectare/acre with the aid of measuring the actual fields cultivated by the cassava farmers.

References

[1]. Abdoulaye T, Abass A, Maziya-Dixon B, Tarawali G, Okechukwu R, Rusike J, Alene A, Manyong V, Ayedun B (2014) Awareness and adoption of improved cassava varieties and processing technologies in Nigeria. Journal of Development Agricultural Economics 6(2):67–75

[2]. Acheampong, P.P. and Owusu V. (2015). Impact of improved cassava varieties' adoption on farmers' incomes in Rural Ghana: A propensity score matching analysis. International Conference of Agricultural Economist, August 8-14, **2015**, Milan, Italy

[3]. Adofu I, Shaibu SO, Yakubu S (2013) The economic impact of improved agricultural technology on cassava productivity in Kogi State of Nigeria. International Journal of Food and Agricultural Economics 1(1):63–74Google Scholar

[4]. Afolami C A, Obayelu A E and Vaughan I I (2015).. Welfare impact of adoption of improved cassava varieties by rural households in South Western Nigeria. Agricultural and Food Economics volume 3, Article number: 18

[5]. Akinnagbe OM, Agwu AE, Igbokwe EM (2008) Agricultural Extension policy for enhancing women participation in sustainable agricultural development in Nigeria. In: Developing Agricultural Extension Policy for Nigeria Proceedings of the 13th Annual National conference of AESON 8 -11 April 2008. Publisher AESONGoogle Scholar

[6]. Asiedu-Darko E., (2013) Agricultural extension delivery in Ghana: A case study of factors affecting it in Ashanti, Eastern and Northern regions of Ghana. Council for Scientific and Industrial Research, Plant Genetic Resources Research Institute, P. O. Box 7, Bunso Eastern Region, Ghana. E-mail: easiedudarko@yahoo.com.

[7]. Atieno, R. (2001) Formal and Informal Institutions' Lending Policies and Access to Credit by Small-Scale Enterprises in Kenya: An Empirical Assessment. African Economic Research Consortium. http://dspace.africaportal.org/jspui/bitstream/123456789/32164/3/RP111.pdf?1

[8]. Azman, E., J.L D'Silva, B.A. Samah, N. Man and H.A.M. Shaffril, 2013. Relatioship between attitude, knowledge and support towards the acceptance of sustainable agricultureamong contract farmers in Malaysia, Asian Soc. Sci., 9: 99-105.

[9]. Doss, C.R. (2003). Understanding Farm Level Technology Adoption: Lessons Learned from CIMMYT's Microsurveys in Eastern Africa. CIMMYT Economics Working Paper 03-07. Mexico, D.F.: CIMMYT

[10]. Food and Agricultural Organization of United Nations - FAO, 2010. FAOSTAT. Food and Agriculture Organization of the United Nations

[11]. Gboku MLS, Karimu S, Davowa AG. (2017). Thematic report on Agriculture, Sierra Leone 2015 Population and Housing Census. Statistic Sierra Leone.

[12]. Guillem, E.E. and A. Barnes, 2013. Farmer perceptions of bird conservation and farming management at a catchment level. Land Use Policy, 31: 565-575.

[13]. Hassan &Nhemachena, (2008). Determinants of African farmers' strategies for adapting to climate change: Multinomial choice analysis. Centre for Environmental Economics and Policy in Africa (CEEPA), University of Pretoria

[14]. Meinzen-Dick R, Adato M, Haddad L, Hazell P (2004). Science and Poverty: An Interdisciplinary Assessment of the Impact of Agricultural Research International Food Policy Research Institute Washington, D.C

[15]. Mkamilo, G.S., and Jeremiah, S, "Current status of cassava improvement programme in Tanzania," in *Afri. Crop Sci. Conference Proceedings*, 7. 1311-1314. 2005

[16]. Hothongeum K., Suwunnamek O., Suwanmaneepong S. (2014). Assessment of Farmers' Knowledge and Attitude Towards the Commercialisation of Tailor-made Fertilisers in Thailand. Administration and Management Colledge, King Mongkut's Institute of Technology Ladkraband. 10520, Bangkok, Thailand.

[17]. Moranga, L.O., 2016. Analysis of factors influencing tomato farmers' willingness to adopt innovative timing approaches for management of climate change effects in Taveta County, Kenya. A Thesis Submitted In Partial Fulfillment Of The Requirements

For The Award Of The Degree Of Master Of Science In Agricultural And Applied Economics, Department Of Agricultural Economics, University Of Nairobi
[18]. Oluwasola, O. (2010) "Stimulating Rural Employment and Income for Cassava (Manihot sp.) Processing farming households in Oyo State, Nigeria Through Policy Initiatives". Journal of Development and Agricultural Economics, 2(2): 018 – 025 February. (Kenya).
[19]. Pender J, Gebremedhin B (2006). Determinants of agricultural and land management practices and impacts in crop production and household income in highlands of Tigray, Ethiopia. Journal of Africa Economics 17(1):395–450
[20]. Rogers EM (1995) Diffusion of innovations, 3rd edn. The Free Press, New YorkGoogle Scholar
[21]. Rogers EM (2003) Diffusion of innovations (5th ed.). New York: Free PressGoogle Scholar
[22]. Samura AE, Fomba SN, Conteh AR, Mansaray A, Norman JE and Dixon AGO. Screening and Identiying Farmers' Prefered Varieties for Adaptability and Resistance to Cassava Mosaic Disease (CMD) in Sierra Leone. (2018). Journal of plant Sciences and Crop Protection, volume 1 / Issue 1
[23]. World Bank: Agriculture for Development, World Development Report 2008. Accessed 4 November 2013, Washington, DC 2008Google Scholar

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