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Promotion and Popularization of Some Elite Cassava Varieties in Igbariam Anambra State: Implication for Food Security and Empowerment

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The study was on promotion, popularisation and dissemination of improved cassava varieties as panacea for increasing production, enhancing food security, income generation and rural empowerment. The study identified the nine best cassava varieties in terms of fresh tuber and gari yield. Sensory evaluation was conducted using a 9 point hedonic scale. The study revealed that all the nine varieties were accepted for food security, income generation and empowerment. Availability of these cassava varieties among farmers in the study area will increase food production, income generation and economic empowerment. The National Root Crops Research Institute, Umudike, Igbariam sub-station should be strengthened to increase cultivation of these cassava varieties for adequate dissemination to the neighbouring communities. This will enable development partners interested in using cassava varieties as panacea to food security and rural empowerment have access to improved cassava planting materials and best agricultural and post-harvest practices.

Keywords: Promotion, Popularization, Panacea, Income Generation, Igbariam, Empowerment.

INTRODUCTION

Nigeria was basically an agricultural nation prior to 1970 but the emergence of petroleum as a foreign exchange earner from the 1980's had ignited a chain of reactions that led to the neglect of the agriculture sector. The consequence of this unfortunate neglect of the agriculture sector has led to high rate of rural-urban migration of youths, unemployment and endemic poverty, especially among the rural populace (Tee *et al*., 2013; Olatunji and Nwakor, 2015). Cassava (*Manihot spp*) once a neglected crop in some places is fast becoming an elite crop in Sub-Saharan Africa, Nigeria inclusive (Phillip *et a.l*, 2004). Nigeria is the largest producer of cassava in the world with a production figure of 54mt (FAO, 2012) and its cassava transformation is the most advanced in Africa (Egesi *et al*., 2006).Cassava is grown throughout the tropics and could be regarded as the most important root crop, in terms of area cultivated and total production (Ano, 2003). It is a major food crop in Nigeria (Ogbe *et al.,* 2007). It is strategically valued for its role in food security, poverty alleviation and as a source of raw materials for agro-allied industries in Nigeria with huge potential for the export market; and provides the livelihood for over 30 million farmers and countless processors and traders (Egesi *et al.,* 2007; CEDP, 2005). Furthermore, Nigeria has the largest

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harvest in the world; three times more than the production level in Brazil and almost double the production level in Thailand and Indonesia. IITA (2005) attributed the large harvest in Nigeria to rapid population growth, internal market demand, availability of high yielding improved varieties of cassava, and increase hectrage of farm land allocated to cassava in the country. Traditionally, an average of three to five crops is often intercropped with cassava. The crops are selected on the basis of differences in growth habits and can be combined in either simple or complex mixtures. Cassava constitutes a major item in the crop combination of the most farmers and contributes significantly to total farm income in Nigeria (Bamire *et al.,* 2004). Cassava growing belts fall within three agro-ecological zones in Nigeria which include: southeast, southwest, and the north-central regions. As a staple, cassava has certain inherent characteristics which make it attractive especially to smallholder farmers in the country. First, the crop is capable of thriving on soils where other crops, most especially grains, failed (Nweke *et al.,* 1994). Secondly, cassava is regarded as a famine reserve crop which requires relatively low amounts of inputs (Enete *et al.,* 2005).

It is the most important food crop in Nigeria (Sanni *et al.,* 2009). However, the volume of production is attributed to the combination of research, promotion, popularisation and extension of new varieties (Akoroda, 2012). Cassava production has witnessed a tremendous increase for different reasons, the introduction of high yielding disease resistant varieties and recently the release of vitamin A varieties (Sanni *et al.,* 2009). Cassava is important in the lives of many Nigerians as it comes first among the root crops. It is processed into different food forms most popular of which is gari in South Eastern Nigeria. Nigeria produces 35 per cent of total African production and 19 per cent of total world production (Sani *et al.,* 2009). The major root and tuber crops grown in Anambra state of Nigeria include cassava, yam, sweet potato and cocoyam.

Cassava is one of the crops that have assumed the role of food security crop, which is a situation in which all people at all times have physical and economic access to sufficient safe and nutritious food to meet dietary needs and food preferences for active healthy life (IFPRI, 2005). Hence, at a cultivation of 3 million hectares and a yield of 11 – 12 tonnes per hectare, at 25% dry matter, at four calories per gram, at an average energy requirement of 2220 calories per capita per day, it is estimated that each of the over 160 million Nigerians can be provided with enough calories for 100 days from cassava alone. This is a sure proof of the contribution of the crop to national food security and that is why the crop remains a miracle crop for Nigerians and must be preserved and supported (Akoroda, 2011). Similarly, cassava is a crop for hunger alleviation and it has a great potential for sustainable food security and export promotion. The advantages of cassava as a candidate crop for hunger alleviation, poverty eradication and food security include tolerance to drought, low demands on soil nutrient, capacity for providing good root yields in areas where other crops fail to grow, low cost of inputs production, flexibility in planting and harvesting periods and long period of ground storage (Eke-Okoro, 2011). The biochemistry of the crop has proved that the protein in the leaves is equal to the protein in egg (Lekule and Sarwatt, 2006). Cassava leaves and roots, if properly processed, can provide balanced diet protecting millions of African children against malnutrition. Its potentials in the fight against hunger and food insecurity are documented (Gregory *et al.,* 2000).

Cassava contributes a lot to the household income in Nigeria and indeed in Africa (Nweke, 1992). Meanwhile, gari is the most consumed and traded of all food products made from cassava. It is a partly gelatinized roasted free granular flour with a slightly fermented flavour, creamy white, yellow if from yellow fleshed roots (vitamin A varieties) or fortified with palm oil. The demand for and market share of Gari appear to be on the rise (Sanni *et al.,* 2009). However, for the research efforts put into this crop to be appreciated the results should be translated in farmers' field and subsequently their livelihood.

Meanwhile, empowerment may be defined as the process of removing the factors which cause the powerlessness. Empowerment has been used to represent a wide range of concepts and to describe a proliferation of outcomes. The term has been used more often to advocate for certain types of policies and intervention strategies than to analyse them, as demonstrated by a number of documents from the United Nations (UNDAW 2001; UNICEF 1999). Kabeer (2001), whose definition is the most widely accepted, defines empowerment as "the expansion of people's ability to make strategic life choices in a context where this ability was previously denied to them". Bennett (2002) described empowerment as "the enhancement of assets and capabilities of diverse individuals and groups to engage, influence and hold accountable the institutions which

affect them." Keller and Mbwewe (1991) described women empowerment as "a process whereby women become able to organize themselves to increase their own self-reliance, to assert their independent right to make choices and to control resources which will assist in challenging and eliminating their own subordination". The core of the meaning of women empowerment lies in the ability of a woman to control her own destiny. Similarly Bennett (2002) describes empowerment as the enhancement of assets and capabilities of diverse individuals and groups to engage, influence and hold accountable the institution which affects them. Narayana (2002), World Development report 2002/2000 defined empowerment as the access to resources expansion and individual agency. Kishore (2002), also opined that empowerment is the power of decision making which is autonomy. Therefore, cassava production attribute of

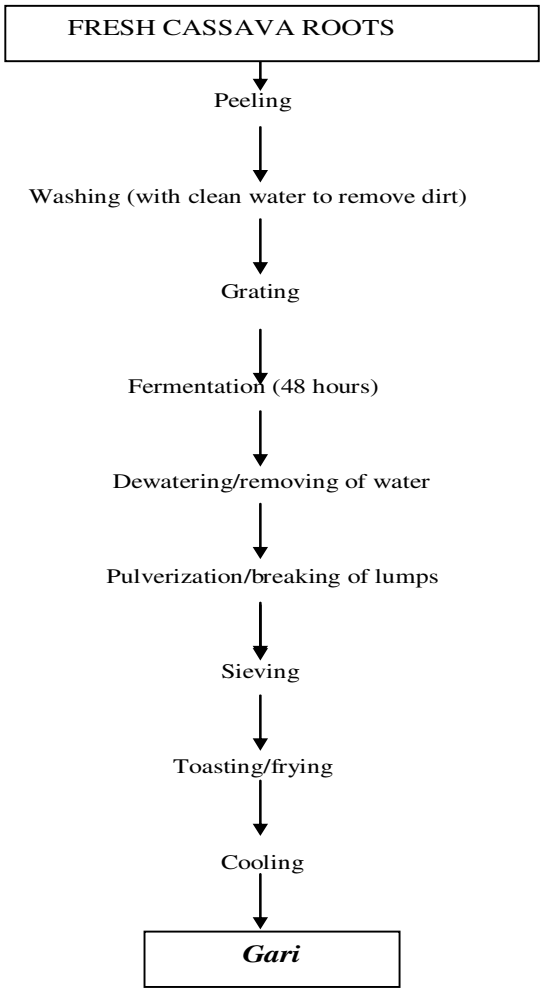

Figure 1: Flow chart for the production of *Gari*.

income and employment generation makes it a candidate of empowerment.

The main objective of this work was to promote and popularise improved varieties of cassava and their implications on food security and empowerment. Specifically, the objectives of the study included to identify the best varieties in terms of root and gari yield, identify the best varieties as perceived by the farmers, and disseminate the chosen varieties.

METHODOLOGY

The study was carried out in Anambra State Nigeria. Anambra State is one of the States in South Eastern Nigeria. It is inhabited by Igbo with about 2% of the population speaking decent. Anambra state lies between Latitude 6^0 20' North and Longitude 7^0 East. It occupies a land area of 4,816 square kilometres. It has a population of 4,177, 828 (NBS, 2006). It is bounded on the West by Edo and Delta States, south by Imo and Rivers States, East by Enugu State and the North by Kogi State. However, Igbariam community was purposively selected because a sub – station of National Root Crops Research Institute (NRCRI), Umudike is located there and the rural farmers have been exposed to improved production and post-harvest technologies from the Institute.

Nine improved varieties of cassava were planted on 0.75 hectare farm in Igbariam. The cassava varieties were TMS 002, TME 419, TMS97/0057, TMS87/184, TMS98/0510, TMS 98/0505, TMS97/4763, TMS 92/0326 and TMS97/2205. The land was ploughed, harrowed and ridged. Ten (10) stands of each variety were harvested and weights taken. Finally, fifty (50kg) of each of the nine varieties were processed into gari using standard method described by Ukpabi *et al* (2013) as shown in Figure 1.

Gari yield was evaluated using simple method that can be easily adapted by the rural gari processor. The weights (kg) and number of cups of gari from each variety were recorded. Gari from the nine varieties were reconstituted

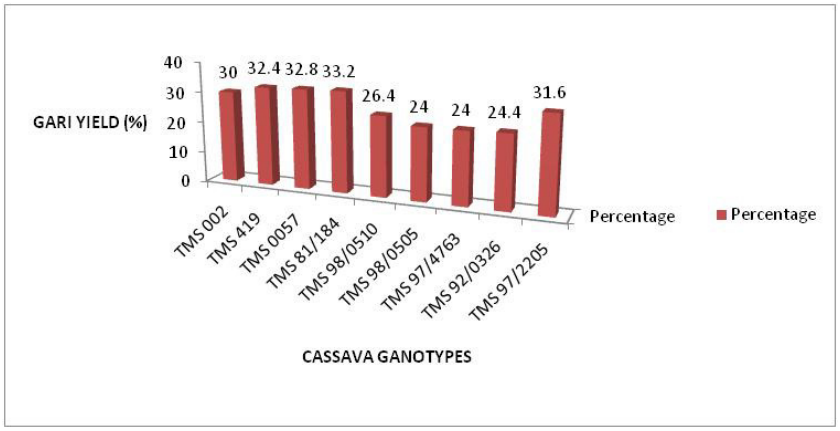

Figure 2: Percentage gari yield
Source: Field Survey 2013

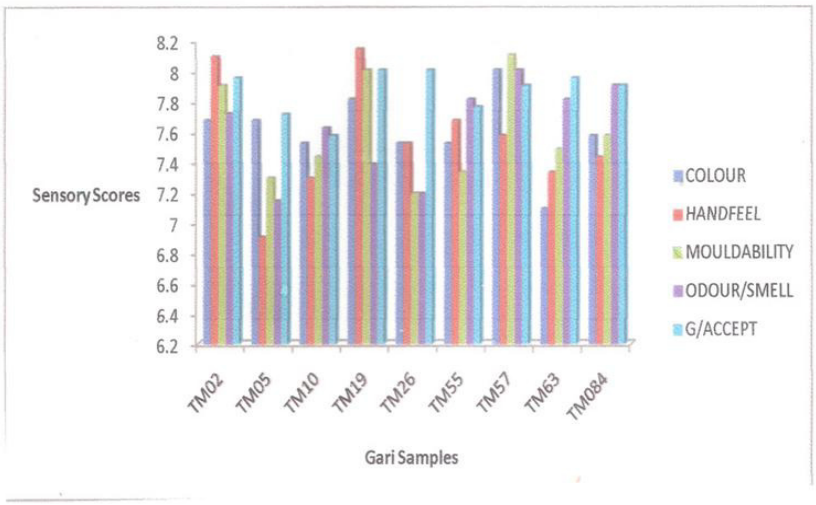

Figure 3: Percentage gari yield
Source: Field Survey 2013

into eba and subjected to organoleptic evaluation. A 9 – point hedonic scale was used by randomly selected 20 trained rural women drawn from around the NRCRI farm. (Where 9 = like extremely, 5 = neither like nor dislike and 1 = dislike extremely; any score above 5 is regarded as acceptable by the panellist) (Iwe, 2002). who under took a sensory evaluation of the eba made from the gari samples.

RESULT AND DISCUSSION

The study evaluated fresh tuber yield, gari yield in weight and number of cups. The result as shown in Table 1 revealed that fresh tuber yield from 10 stands of TMS 98 /0510 gave the highest yield of 57.0kg. This was followed by TMS 97/0057 which gave 55.0kg. There was not much significant difference in fresh tuber yield as observed from the table apart from TMS 98/0505 that had fresh tuber yield of 12.2kg. This was attributed to both rodent attack and rot. However, Gari yield from 50kg of the different cassava varieties ranged from 12.0kg to16.60kg. It was found that TMS87/184 variety had the highest number of cups. This was closely followed by TMS97/0057 with yield of 16.40kg. Similarly, TMS97/2205 variety gave the highest number of cups (77.5 cups), this was followed by TMS 97/0057 which gave $69^{1}/_{2}$cups. Although TMS 98/0505 variety had the lowest fresh tuber yield the gari yield was comparatively high. Interestingly, the results show that the yields did not differ much in terms of fresh tuber yield (kg) gari yield (number of cups). This is in tandem with the a priori expectation since these varieties had been adjudged improved in the sense that they are high yielding and pest and disease tolerant hence the yield recorded from all of them. The result of the sensory evaluation of the eba made with gari from the new cassava varieties revealed that there was no significant difference in colour, hand feel

Table 1: Cassava fresh tuber yield, gari yield and number of cups of the different varieties.

Sample	Fresh Tuber Yield from 10 stands.	Gari from 50kg	No of cups
TMS 002	46.0 kg	15.0 kg	66 cups
TMS 419	47.0 kg	16.2 kg	66.5 cups
TMS 0057	55.0 kg	16.4 kg	69.5 cups
TMS 81/184	52.5 kg	16.6 kg	68 cups
TMS 98/0510	57.0 kg	13.2 kg	66 cups
TMS 98/0505	12.0 kg	12.0 kg	62 cup
TMS 97/4763	42.5 kg	12.0 kg	57 cups
TMS 92/0326	50.0 kg	12.2 kg	77.5 cups
TMS 97/2205	39.5 kg	15.8 kg	77.5 cups

Source: Field Survey 2013.

Table 2: Sensory Evaluation of Gari made from new cassava Genotypes.

SAMPLE	COLOUR	HANDFEEL	MOULDABILITY	ODOUR/SMELL	G/ACCEPT
TM02	7.67	8.09	7.90	7.714	7.95
TM05	7.67	6.90	7.29	7.14	7.71
TM10	7.52	7.29	7.43	7.62	7.57
TM19	7.81	8.14	8.00	7.38	8.00
TM26	7.52	7.52	7.19	7.19	8.00
TM55	7.52	7.67	7.33	7.81	7.76
TM57	8.00	7.57	8.10	8.00	7.90
TM63	7.09	7.33	7.48	7.81	7.95
TM084	7.57	7.43	7.57	7.90	7.90
SE of mean	0.209	0.292	0.207	0.199	0.199

Source: Field Data 2013
Mean of triplicate data presented.

mould ability and general acceptability. The eba from all the varieties are acceptable to the panellist as shown in table 2. The result shows no significant pairwise difference among the means.

CONCLUSION/RECOMMENDATION

The study examined promotion and popularisation of some elite cassava varieties and its implication on food security and empowerment. It was observed that these varieties are acceptable in terms of fresh tuber yield, gari yield and quality. Thus, availing the farmers planting these improved cassava varieties increased productivity; enhanced income, food security and empowerment. Similarly, increase in gari production in the study area will take care of their food needs, additional income thus empowering the rural women who are the major stakeholders involved in the processing of cassava. Women from the environment mainly sold their gari in cups thus there should be institutional policies to ensure that correct unit of measurements are made available to prevent double dealing. The National Root Crops Research Institute, Umudike, Igbariam sub-station, Anambra State should be strengthened to increase cultivation of these cassava varieties for adequate dissemination to the neighbouring communities. This will enable development partners interested in using cassava varieties as panacea to food security and rural empowerment have access to improved cassava planting materials and best agricultural and post-harvest practices.

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