Nigerian Agricultural Policy Research Journal (NAPReJ) Agricultural Policy Research Network (APRNet)
Vol. 10, Special Issue. Website:http:// www.aprnetworkng.org ©2022

ISSN 2536-6084 (Print) & ISSN 2545-5745 (Online)

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Cassava Seed Entrepreneur Model: A Strategy for Youth Empowerment among Selected Value Chain Development Project (VCDP) States in Nigeria

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A R T I C L E I NFO

Key words:

Youth,

cassava,

stem,

entrepreneur,

seed,

empowerment

ABSTRACT

One hundred and twenty (120) randomly selected youths from Nine (9) states of Nigeria which include Anambra, Ebonyi, Enugu, Kogi, Nasarawa, Niger, Benue, Taraba and Ogun, under the Federal Government of Nigeria (FGN) and International Fund for Agricultural Development (IFAD) sponsored Value Chain Development Programme (VCDP) in collaboration with Building An Economically Sustainable and Integrated Cassava Seed System (BASICS 11 project)were on boarded into the Cassava Seed Entrepreneur programme and trained on good Agronomic Practices (GAP), enterprise development, marketing and business opportunities in the cassava seed system of Nigeria. Baseline information on the socioeconomic characteristics of the trainees, assessment of their cassava varietal preferences as well as the strengths, weaknesses, opportunities and threats to cassava seed entrepreneurship among the youths were obtained through the use of a well-structured questionnaire. Data generated were analyzed using descriptive statistics. Results obtained show that majority of the youths were males (over 60%), belonging to cooperative societies and well educated. Most of them preferred TME 419 variety and among the threats to a successful cassava seed entrepreneurship is the non-involvement of National Agricultural Seed Council. It is therefore recommended that the youths be more engaged in cassava seed business as a means of improving their livelihoods.

1.0 Introduction

Nigeria leads the world in cassava production (Olutosin and Sawicka, 2019), with about 59 million tonnes in 2017 (FAO, 2019), contributed up to 21.5% of Africa's cassava production (FAOSTAT, 2020). The desire to sustainably increase production, improve food security, while also providing nonfood products from cassava spurred many countries to explore innovative processes within their agricultural systems (Adeyemo *et al*, 2019).

Since its emergence in Africa in the 16th and 17th centuries, the crop has replaced several traditional staples and has been successfully incorporated into many farming and food systems in the continent. About 90% of this is however consumed as food in form of *gari*, l*afun* and *fufu* and also 70% of cassava produced in Nigeria is processed into gari (Onabalu, 1997). The potential of the crop is large because it offers the cheap source of food calories and the highest yield per unit area. It also has multiple roles as famine reserve, food and cash crop, industrial raw material and livestock feed (Ospira-Patino and Ezedinma, 2015). As a cash crop, cassava generates cash income for the largest number of households, in comparison with other staples, contributing positively to poverty alleviation (Obisesan, 2012 and Ezeibe, *et al.*, 2015).

However, Nigeria has not been producing cassava output that would be relatively enough for export simply due to a number of factors which include small scale farming (on plot that are usually less than 1 hectare), manual operation, little or no use of agro-chemicals and limited knowledge in the use of high yielding roots, disease and pest resistance, and environmentally friendly varieties (Olomola, 2007). Cassava stem is gradually becoming relevant in the agribusiness sector due to the rising need to plant

ISSN 2536-6084 (Print) & ISSN 2545-5745 (Online)

improved varieties that are early maturing high yielding and disease resistant.

In Nigeria, the seed industry is rapidly developing especially for crops like cassava whose botanical seeds are not consumed or popularly used for planting. Private seed companies are now becoming interested in multiplication, distribution and marketing of cassava seed. With improved technology, cassava seed can now be multiplied within a very short period of time. Seeds are the foundation of agriculture and the most important input (Onunka *et al* 2016) in the production process of most crops especially root and tuber crops. Clean cassava seeds of high quality needed for planting are often in short supply.

Cassava stem production has been found to be a profitable venture but requires compromising the root yields by reducing the planting distance to as low as 1m x 0.5m inter and intra row spacing instead of the normal 1m x 1m spacing. By this arrangement, the plant population of about 20,000/ha is expected. This will translate to about 400-500 bundles of cassava stem at first ratoon depending on variety. The success of cassava seed multiplication and sales depends on the quality of planting material. Quality should actually separate the local and improved varieties. The criteria used in determining quality of planting materials of cassava are generally based on the threshold levels of infestation of diseases and pests.

Figure 1: Improved cassava seed multiplication farm

Improving access to quality seeds and transiting from subsistence to commercial production requires an integrated seed system, where certified cassava stems are available and accessible from formal (seed companies, NGOs and research institutes) and informal sources (Cassava Matters, 2017). However, government monopoly in the seed industry of Nigeria has caused undue delays in distributing approved planting materials to farmers. There is the need to establish a formal seed distribution system that will involve multi stakeholder participation in the cassava seed multiplication and distribution system.

The cassava seed entrepreneurship model emphasizes the production and distribution of certified cassava seed with the approval of National Agricultural Seed Council of Nigeria (NASC). Certified seed is the progeny of foundation seed and its production is supervised and approved by certification agency. This is the commercial seed which is available to the farmers. It is produced through the multiplication of basic/foundation seed. Here, production, fields are managed by small-scale farmers and NGOs, but under the supervision of a certification scheme. Crop fields which fall within the acceptable score range of quality standards qualify as good planting materials, while those outside the range are rejected. The certified seed producers are the cassava seed entrepreneurs who are trained and have the capacity to undertake seed production and distribution as a business. They will ensure that preferred improved clean planting materials are available in the right quantities and time to the local cassava farmers. By this Entrepreneurship-based model, the problem of variety mixture, distribution of infested materials, and damage to stems on transit are avoided.

Development of an efficient and formal cassava seed production and distribution system will:

- ✓ Encourage entrepreneurship in the multiplication and distribution of cassava seed
- ✓ Guarantee knowledge of source of planting material and varieties
- ✓ Provide an affordable and timely means to deliver Clean and quality planting materials to cassava farmers in Nigeria
- ✓ Enable more efficient dissemination and adoption of new cassava varieties of cassava
- ✓ Increase stakeholder synergy and networking along the cassava value chain
- ✓ Enhance business capacities of cassava farmers and processors
- ✓ Encourage gender participation and youth involvement in cassava seed multiplication and distribution
- ✓ Enhance availability and accessibility of true-type and clean planting materials to cassava farmers
- ✓ Boost export and Quality control
- ✓ Efficient Cassava pests and diseases management
- ✓ Encourage seed companies to venture into vegetative seed marketing
- ✓ Increase cassava yield

ISSN 2536-6084 (Print) & ISSN 2545-5745 (Online)

To achieve these, individuals who are already cassava farmers that have the capacity and show interest to drive this agenda of cassava seed multiplication and marketing as a business are encourage to become entrepreneurs in the cassava seed business.

The term 'entrepreneur' has been said to derive from the French word 'entreprende' which means to 'begin something' or to 'undertake'. Hence, at its simplest, an entrepreneur can be said to be someone who begins something. However, the term is normally associated with those starting up a business but is more than simply "starting a business." It is a process through which individuals identify opportunities, allocate resources, and create value. This creation of value is often through the identification of unmet needs or through the identification of opportunities for change" (Chidiebere *et. al.*, 2014). Njoku *et al*. (2014) sees an entrepreneur as a person who brings in overall change through innovation for the maximum social good. Human values remain sacred and inspire him to serve the society. He has firm belief in social betterment and he carries out this responsibility with conviction. In this process, he accelerates personal, economic as well as human development. The entrepreneur is a visionary and an integrated man with outstanding leadership qualities. With a desire to excel, he gives top priority to Research and Development. He always works for the well-being of the society. More importantly, entrepreneurial activities encompass all fields/sectors and foster a spirit of enterprise for the welfare of mankind.

The core mission of Building a Sustainable and Integrated Cassava Seed System (BASICS) is a fundamental overhaul of the cassava seed sector into a responsive, sustainable and integrated value chain that has the potential to significantly raise the cassava productivity in Nigeria. To achieve this, the project in partnership with major stake holders in Cassava such as International Institute for tropical Agriculture (IITA) and National Root Crops Research Institute (NRCRI) developed the Cassava Seed Entrepreneurs Model. The model seeks to identify, onboard and encourage already existing cassava farmers, who have the capacity and willingness to undertake cassava seed production and marketing as a business. The most visible aspect of this encouragement is by training and retraining of the cassava seed farmers on Good Agronomic practices, pests and disease control, business and marketing strategies among others.

With an estimated 70% of the total population of Nigeria living in rural areas, agriculture is the mainstay of economic activity. The livelihood of smallholder farmers has been constrained by a host of challenges: low productivity; paucity of opportunities for value addition; environmental degradation; limited access to productive assets and inputs; inadequate support services; limited access to rural financial services; inadequate market and rural infrastructure; post-harvest losses and a constrained enabling environment. To address these challenges, the VCDP aims to enhance productivity, promote agro-processing, access to markets opportunities, facilitate engagement of the private sectors and farmers' organizations in the developmental efforts.

National Root Crops Research Institute, Umudike in collaboration with FGN/IFAD Assisted Value Chain Development Programme conducted a 2-week training for 120 youth Cassava farmers from 9 states of Nigeria (Anambra, Ebonyi, Enugu, Kogi, Nasarawa, Niger, Benue, Taraba and Ogun), to onboard them into Cassava seed entrepreneurship after the training on Good Agronomic practices, pest and disease management, business and enterprise development strategies, as well as, seed certification, seed tracking, nutritional perspectives and benefits of producing Pro-vitamin A cassava as keys in ensuring cassava production and food security in Nigeria. This paper therefore examined the socioeconomic characteristics of the youth participants in the FGN/IFAD VCDP, assess cassava varietal preferences among the youths as well as identify the strengths, weaknesses, opportunities and threats to cassava seed entrepreneurship in the states.

ISSN 2536-6084 (Print) & ISSN 2545-5745 (Online)

NRCRI Umudike Management Team flanked by the 120 youths from 1st and 2nd cycle

Cassava seed certification

Seed certification is a process designed to maintain and make available to the general public continuous supply of high-quality seeds and propagating materials of notified kinds and varieties of crops, so grown and distributed to ensure physical identity and genetic purity (www.vikaspedia.in/agriculture). Seed certification is a legally sanctioned system for quality control of seed multiplication and production. The main objective of the Seed Certification is to ensure the acceptable standards of seed viability, vigour, purity and seed health. A well-organized seed certification should help in accomplishing the following three primary objectives.

- The systematic increase of superior varieties;
- The identification of new varieties and their rapid increase under appropriate and generally accepted names.
- Provision for continuous supply of comparable material by careful maintenance.

Cassava seed certification therefore implies a continuous process of quality control that ensures compliance to specific guidelines in the production of cassava seed and supervised by the agency approved by law to carry out such supervision. In Nigeria, the National Agricultural Seed Council has the responsibility to supervise and approve cassava seed farms for certification based on established laws of the country. The agency is also empowered to prosecute offenders to the seed Law.

Procedure of certification

The process of cassava seed certification begins with field preparation until harvesting. The following procedure is recommended:

- Verification of seed source, class and other requirements of the seed used for raising the seed crop.
- Inspection of the seed crop in the field (minimum of 3 visits) to verify its conformity to the prescribed field standards. (Ensure that variety planted is true to type, no crop mixtures, minimum protection distance and disease-free crops)
- Supervision at post-harvest stages including processing and packing.
- Drawing of samples and arranging for analysis to verify conformity to the seed standards; and
- Grant of certificate, issue of certification tags, labeling, sealing etc.

However, certification is field specific, attracts a fee and done annually.

Farmers' perception to the use improved cassava varieties

Cassava production is essentially an age long activity in most communities in southern and middle belt areas of Nigeria. Its seed production and distribution pattern are largely informal and the farmers tend to hold on to their production system tenaciously, believing that the routine practice of sharing and using available planting material does not affect output. In describing market imperfections associated with vegetatively propagated crops (VPC) in Nigeria, Wossen et al (2020) stated that Cassava in Nigeria offers a useful contrast to the prevailing narratives on cereal seed systems in Africa not least because Nigeria is host to a poorly functional VPC seed system within an economy that is significantly fuelled by cassava, and is in search of new and innovative solutions to problems facing the crop's cultivation and use.

Improved cassava seed use and distribution is a new concept driven by the need to improve yield and income to the farmers. Since the commencement of a project named Building an Integrated and Sustainable Cassava Seed System in 2016, a concise effort is being made to change the narrative in cassava seed system and get the farmers to adopt and use improved cassava varieties through the network of seed entrepreneurs in the rural cassava growing communities of Nigeria. BASICS project has really reoriented farmers' perception in the use of improved varieties. Most farmers in the pilot states of South east and south-south have adopted improved varieties of cassava.

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Methodology

120 youths were randomly selected from nine states (Anambra, Ebonyi, Enugu, Kogi, Nasarawa, Niger, Benue, Taraba and Ogun) for the study. The distribution of participants by states and Local government Area are shown in table 1 below.

ISSN 2536-6084 (Print) & ISSN 2545-5745 (Online)

Table 1: Distribution of participants across states and Local Government Areas

States	Number of LGAs	Number of Representatives
Kogi	4	20
Nassarawa	5	20
Enugu	3	20
Anambra	3	9
Benue	3	9
Ebonyi	3	9
Niger	3	9
Ogun	5	15
Taraba	3	9
Total	32	120

A well-structured questionnaire was used to elicit information on the socioeconomic characteristics, production status and varietal preferences of the VCDP youths in the selected states. Data collected were analyzed using descriptive statistics and likert scale. Results are presented in tables, frequency distribution and percentages.

Results and discussion

Socioeconomic characteristics of the VCDP youths
The descriptive statistics obtained from SPSS was used to determine the socioeconomic characteristics of the youths (trainees) who were trained on cassava seed production and marketing. Table 2 presents the socioeconomic profile of the trainees. The Table indicates that the majority (66.7%) of the trainees were males with relatively small farms.They are experienced in cassava production; however, most of them had no formal training on agronomic practices of cassava seed production. Although, a vast majority of the youths (98.3%) are members of cooperative societies, they had limited access to credit. Table 3 displays the distribution of the socioeconomic characteristics of the trainees. It reveals that most of the youths were farmers who had tertiary education. On average, 79.5% of them were farmers while 70.7% had tertiary education. They were previously involved in cassava stem commercialization (marketing of uncertified stems) in Nigeria. About 99% of the youths indicated that their clients usually pay cash at the point of sale of stems ('cash and carry' basis. Nevertheless, some of them (9.4%) pre-order stems. Purchases are made regularly as indicated by the youths (88.70%)

Table 2: Socioeconomic profile of the trainees

Variables	Trainees
Gender (% male farmers)	66.7
Membership of cooperative society	98.3
Engagement in thrift	33.3
Access to loan	23.9
Average household size	6.0
Average farm size(ha)	1.62
Farming experience(yrs)	8.6
Training on agronomic practices	33.3

Source: Field survey, 2021

3. Distribution of socioeconomic characteristics

Variables	Farmers (%)
Education	
No formal education	
Primary	4.3
Secondary	24.1
Tertiary	70.7
Total	100.0
Primary Occupation	
Farmer	79.5
Civil Servant	8.9
Others	11.6
Total	100
Marital Status	
Single	49.6
Married	50.4
Total	100.0
Frequency of purchase	
Rarely	11.3
Often	44.4
Most often	44.3
Total	100
Order of cassava seed	
Cash and carry	98.9
Pre order	9.4
Total	108.3

Source: Field survey, 2021
Note: Percentage could exceed 100% because of multiple responses

Previous involvement of VCDP youths in cassava value chain
The trained youths were previously engaged in informal cassava stem marketing, although commercialization of cassava stem is not popular in most parts of Nigeria. Selection of youths who were previously engaged in cassava stem production is an indication of commitment (on the side of the trainees)

ISSN 2536-6084 (Print) & ISSN 2545-5745 (Online)

and success in the cassava seed system. Table 4 shows production and marketing of cassava stems by trainees in Nigeria. The Table indicates that youths are expanding area under cassava stem production. This could be due to the profitability of the business. Although there was an increase in the area cultivated, quantity of stem produced declined from 180 bundles in 2020 to 115.7 bundles in 2021. The quantity of stem marketed also decreased from 120.4 - 86.3 bundles in 2020 and 2021 respectively. The decline in the quantity of marketed cassava stem could be on one hand, due to buyers' dissatisfaction in the quality of cassava stems purchased and on the other hand, could be due to the recycling of cassava stems by the buyers. Continuous use of cassava cuttings from previous harvest (the common practice in Nigeria) should be discouraged. Cassava is propagated vegetatively; the cuttings accumulate pathogens over time if repeatedly used. Pathogens that affected the parent are transmitted to the newly established plant through the cuttings (Legg et al., 2022). Also, poor knowledge of the agronomic practices of stem production, hence the need to train farmers on agronomic practices of cassava stem production.

Table 4: Production and marketing of cassava stems by the trainees

Farm size 2020	Farm size 2021 (ha)	Quantity of stem produce2020 (bundle)	Quantity of stem produce 2021 (bundle)	Quantity of stem sold 2020 (bundles)	Quantity of stem sold 2021 (bundles)
1.35	1.62	180.04	115.7	120.4	86.28

Source: Field survey, 2021

Cassava varieties and their prices in the VCDP States Nigeria

This investigation reveals that a vast majority of VCDP youths plant improved varieties. Table 5 displays the cassava varieties under production in Nigeria. It reveals that most of the youths (86.3 %) planted TME 419, followed by Yellow Root (29.9%), then TMS 0505 (17.9%). Insignificant parentage of the trainees (6%) planted local varieties. Table 6 shows cassava varieties and preferred stem prices. The Table indicates that youths were willing to pay more for TMS 0505 (N1541.67/bundle) and yellow root (N1228.37/bundle). Tabe 7 presents the ranking of cassava varieties according to preference. It shows that TME 419 is the most preferred variety, followed by Yellow Root, then TMS 0581 (Dixon) among others. TME 419 and TMS 0581 were preferred possibly because of their high yield and dry matter content while the choice of yellow root may be due to its nutritional value.

Table 5: Cassava varieties under production in Nigeria

Varieties	*Farmers (%)
TME 419	86.3
Yellow root	29.9
TMS 0505 (fine face)	17.9
TMS 0581 (Dixon)	9.4
TMS30572	15.8
Local varieties	6.0
NR 8082	0.9
TMS 4(2)1425	4.3

Source: Field survey, 2021
Note:* Percentage could exceed 100% because of multiple responses

Table 6:. Cassava varieties and preferred stem prices

Varieties	TME 419	Yellow root	TMS 0505	TMS 0581	TMS 30572	Local variety
Preferred price (₦/bundle)	1141.33	1228.57	1541.67	1035	1100	1125

Source: Survey 2021

Table 7. Ranking of cassava varieties according to preference

Varieties	4	3	2	1	Weighted average	Ranking
TME 419	82.9	6.8	1.7	0	35.54	1
Yellow root	2.6	20.5	7.7	0.9	8.82	2
TMS 0581 (Dixon)	3.4	13.7	8.5	4.3	7.6	3
TMS 0505(fine face)	2.6	12	6	1.7	6.01	4
Local varieties	1.7	2.6	0.9	0.9	1.73	5
4(2)1425	0	0	0	0.9	0.09	6

Source: field data, 2021
Note: 1- 4 denote scores in increasing order of magnitude; the most important was ranked 1. These variables did not add up to one hundred because zero percent was excluded from the estimation

ISSN 2536-6084 (Print) & ISSN 2545-5745 (Online)

Strengths, Weaknesses, Opportunities and Threats (SWOT) of cassava seed business in the VCDP state

Strengths	**Weaknesses**
✓ New and improved cassava varieties available ✓ NRCRI/IITA developing farmer preferred varieties ✓ Network of trained CSEs and farmers ✓ CSEs already in Agribusiness	• Poor synergy among VCDP States • High transportation cost • Stem buying behaviour of small holder farmers • Existence of older varieties with farmers
Opportunities	**Threats**
➢ High demand for Cassava products ➢ Availability of numerous small holder cassava farmers in the VCDP network ➢ Expanding markets for improved cassava seed ➢ Partnership between IFAD and NASC in Third Party Certification	❖ Non certification of improved cassava stem **(may be a killer threat)** ❖ Quality of cassava seed sold is not guaranteed ❖ Varietal mix up could lead to loss of traceability

Conclusion

Production and marketing of cassava seed is one way of ensuring that only certified quality seeds are in circulation, increasing incomes to youth cassava farmers and reducing unemployment in Nigeria. The VCDP youths have the capacity and are willing to undertake cassava seed entrepreneurship as a veritable source of income and livelihood improvement. It requires stakeholders' synergy to be efficient. The IITA/NRCRI BASICS 11 project has provided the platform for this to happen by on boarding the 120 youths from nine States to propagate this initiative. NASC involvement is paramount to the success of this activity.

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