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Seed Entrepreneurship in Benue State- Exploring A Sustainable Cassava Seed System for Job Creation and Wealth Generation in 2022

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Abstract

The major reason for low yields among crops in Africa is the continuing use of old, often diseased materials and the low level of adoption of new, higher yielding varieties. This is also true for cassava. Plant breeders and seed scientist have collaborated and developed a variety of improved varieties but the challenge has been delivering these to the farmers as quality seeds for planting. The public service in Nigeria in collaboration with nongovernmental organizations have previously launched campaigns to multiply and distribute cassava seeds (stems) but these efforts have been sporadic, unreliable and especially unsustainable as no one knows the next time such an activity will come again. This gives no room for planning. This work examines the critical components necessary for a sustainable cassava system that if implanted will completely solve the perennial problem of acute shortage of cassava seeds (stems) in Benue State and by extension Nigeria.

Introduction

African Farmers rarely have access to a reliable supply of disease-free planting materials of improved and preferred varieties (Atser et al., 2019). Cassava production has increased five folds in sub-Saharan Africa, Nigeria inclusive since 1970 up to the latest year of available statistics in 2019, where it has grown upward to 192 million tons from 41 million tons (Food and Agriculture Organization Statistics [FAOSTAT], 2019). The statistic went further to state that cassava yield however has remained low, with the highest yield hovering around 12 tons per hectare per year. This implies that cassava production is largely being driven by area expansion rather than yield per unit area. This means that despite huge efforts going into production, the returns on investment per unit area of the land have been low. As a solution to this challenge, especially bearing in mind that comparable yields with other countries is higher than Nigeria by up to 10 million tons per hectare, a new model is being implemented. This model creates new enterprises for the rapid and regular production of Early Generation Seeds (EGSs) that are sold to a decentralized network of Commercial Seed Entrepreneurs (CSEs) for further mass production and sale to end user farmers for direct field planting for purpose of root (tuber) production.

This model known as BASICS focuses on economic sustainability to ensure the regular and reliable supply of quality planting materials of improved and most preferred cassava varieties that enhance yield and profitability of production. The model is also being implanted in Benue State by the Joseph

Sarwuan Tarka University, Makurdi, Benue State as a partner of the International Institute of Tropical Agriculture, Ibadan.

The demand for food to feed the ever growing population of Africa's rapidly growing population is very high. Crop yields on the continent are struggling to keep pace. With estimates of over 200 million people in Nigeria, cassava yield of 10 tons per hectare per year is a far cry from where we ought to be. Climate change is making farming generally more difficult by causing droughts, less reliable rainfall onset time for the season and especially rainfall amounts. There is shift in pest and disease attacks.

Cassava plays an important function in the food requirement of Nigeria, but yields would have to rise to meet the diverse demand to tackle food security. In Benue State for example, for the third year running, the price of Garri for a 4-liter capacity rubber paint container has maintained between N1, 000 to N 1,300 across the biggest markets of Adikpo, Ihugh, Korinya, Daudu, Zaki –Biam, Onyagede, Ugbokolo and Otukpo. The price for Akpu for the smallest bag of about 10kg is been sold between N 3, 500 to N 5,000. A bag of dry cassava chips has been within the range of N 20, 000 to N 28, 000 per 100kg bag. Starch production is only being explored by few investors in Benue State. The new variety of ways of consumption of cassava in Benue State has resulted in a surge in the demand in 2021 not seen before. It is being eaten boiled, roasted, pounded directly after boiling and eaten or boiled and eaten with oil or pounded groundnut. This is very popular among

the Tiv, Idoma and Iggede tribes. Some boil the roots and pound with sweet potatoes while others boil the roots with yam and pound into a fine thick paste that is eaten with soups, especially pounded or crushed boiled okra. There is still room for further studies on forms of utilization of cassava as direct edible food without much processing across different ethnic groups in Nigeria, a way of celebrating and showcasing the crop to the world. Cassava is being used as a choice crop for stabilization after the herdsmen/ farmers crisis by farmers in Guma, Logo, Kwande, Agatu Gwer West, Gwer East etc. This is also the case in local governments coming out of crisis between militias like in Katsina –Ala, Ukum, Oju and Konshisha where large amount of damage was done to those communities. Cassava has become their easiest beacon of recovery through the new/ improved varieties that maximally mature early, between 10 -12 months.

The Benue State cassava boom of 2022 kick-started this January by a new cassava product ethanol from the cassava processing company, Pure Biotech Company Limited, Makurdi. The company announced commencement of procurement of the chief raw material cassava roots on the 1st of November, 2021, and that it would be requiring 300 -500 metric tons of fresh and dry cassava daily. This requires doubling of efforts to forestall an imminent cassava shortage crisis which might push up the prices of cassava derivatives out of the reach of the ordinary urban dwellers in Benue State.

The cassava shortage crisis in Benue State can only be averted if farmers discontinue using diseased cassava planting materials of old varieties that were not bred for the changing environment. Farmers need reliable access to cassava stems of new, improved, climate –smart varieties to increase yields and move towards a more food secured society that will also be able to buffer any further instantaneous sharp demands by emerging enterprises in cassava processing.

A Working Seed Supply Model

In an attempt to provide a way out of the quality cassava seed shortage of now and in the future, a well designed, developed, tested and proved the Building Economically Sustainable Integrated Cassava Seed System (BASICS) is being advocated. This is to create a sustainable formal seed system that connects the value chain from growing the breeder and foundation seeds to commercial seed production, incorporating genetic purity and quality assurance for health and varietal purity. This model leverages on high propagation ration methods such as the semi Autotrophic Hydroponic (SAH) technology to increase the pace of seed multiplication at the breeder seed level and nurtures the creation of new Early Generation Seed Enterprises to produce and sell foundation seeds to a network of Commercial Seed Entrepreneurs who multiply and sell cassava stems as planting to farmers. A digital tracking system called seed tracker aids in quality certification.

The main thrust of the BASICS mode is that it places emphasis of clean and disease-free varieties that are in high demand by the farmers, who are the end users. The two devastating diseases in cassava are the Cassava Brown Streak (CBS) and the Cassava

Mosaic Disease (CMD). Bred varieties must be tolerant of these two diseases. To ensure this, the model stresses the active participation of the certification actors in the seed value chain. The creation of the early generation seed component ensures that breeder seeds are rapidly multiplied overcoming the constraint from the low multiplication ratio of vegetatively propagated corps. The last but very important thing is that the BASICS model highlights the need for commercialization at all levels. This is achieved through the activities that create demand such as advocacy about yield potentials of improved cassava varieties, marketing and promotion through training of farmers of field days, video shows, dissemination through printed papers and radio interviews on Harvest FM Makurdi to ensure sustenance of interest by the farmers/ investors, thereby ensuring that producers of cassava seeds have access to markets to sell their products (stems). In Benue State this model is being implemented in conjunction with the Catholic Relief Services (CRS), where there are youths who are employed as marketers who are involved in aggressive advocacy and marketing in both Makurdi and Gboko Catholic Dioceses. They have links with local seed entrepreneurs and when there is demand, they link buyers with them. In this way, the seed entrepreneurs are always assured of market for their stems. This is empowering many seed entrepreneurs in places like Naka, Aondoana, Taraku, Howe Ahumbe, Oju, Vandeikya, Fiidi, Aliade, Otukpo, Ugba, Buruku, Agidi, Jov Ikyundan, Tse-Agbaragba, Wuese, Zaki-Biam, Kwande etc. This has also created commercial cassava seed vendors in Makurdi, Gboko, Otukpo and outside Benue State that depend on these seed entrepreneurs. The case of Open Doors Women Multipurpose Cooperative Society in Mbatie, Buruku is noteworthy. These women have moved from about 3 -4 Hectares in 2018 to 54 hectares in 2020, with efforts in 2021 to move up to 100 Hectares in 2022. They are playing a major role as cassava seed producers in the State.

Profitability in Cassava Seed Supply

The difference between the BASICS model and traditional multiplication schemes is that it emphasizes profitability to ensure a reliable and sustainable supply of planting materials. Farmers buy stems from cassava seed entrepreneurs who use these revenues to sustain their seed businesses and are encouraged to continue to sell stems for years to come. Early generation seed businesses are similarly designed to sell foundation seeds to the cassava seed entrepreneurs for multiplication, generating huge revenues to sustain their operations. This model incorporates quality control, inspection and certification systems to ensure trueness to type and phytosanitation.

Benefits of a Good Cassava Seed System

There are many benefits of a good cassava seed system like BASICS. The main ones include:

1. Increase in cassava productivity
Research data show that farmers who use improved varieties can achieve yields of 64% higher than those who plant saved “seeds” of older varieties (Assfaw et al., 2017).

2. Promotion of quality and disease-free seeds
This is achieved by systematically linking farmers to the seed supply chain that involves Foundation Seed Producers and Cassava Seed Entrepreneurs.
3. Preventing the spread of cassava diseases
This model ensures that seed quality is assessed at all levels of the system, ensuring that only high quality material is sold to farmers.
4. High multiplications ratio through the Semi-Autotrophic Hydroponic (SAH) technology and associated complementary techniques. There are currently five SAH laboratories in Nigeria, one at IITA, Ibadan and another at National Root Crops Research Institute in Umudike as well as three in private processing companies.
5. Job and wealth creation
The problem of youth unemployment is a huge problem in Benue State even with the huge agricultural land and river and streams available for production. Youths who have adopted the cassava seed entrepreneurship programme are making a decent living by growing and marketing stems of improved and preferred cassava varieties. SAH labs provide employment for youths and women. Also, producing early generation seeds is a great opportunity for job creation and empowerment for women and young people, especially young graduates.
6. Responds to feedback to and from end users.

This leads to breeding of cassava variates with the preferred qualities.

Moving forward in the cassava seed system in Benue State

In order to move forward, the following should be done

1. The Benue State Ministry of Agriculture and Food Security to partner with the Joseph Sarwuan Tarka University, Makurdi and the Akperan Orshi Polytechnic Yandev, Gboko to rapidly multiply planting materials of the most promising new cassava varieties for sale to farmers in the state at subsidized rates.
2. The Joseph Sarwuan Tarka University to establish a Root and Tuber Research and Development Center (RTRDC) under the institute of food security of the university to coordinate the multiplication of Early Generation Cassava Seeds or rapidly multiply Breeder Seeds.
3. The RTRDC established will nurture the creation of a network of cassava seed Entrepreneurs. These are farmers who will be trained and supported even if on loan arrangement to multiply and sell cassava stems profitably in their communities.
4. The Federal Ministry of Agriculture and Rural Development of Nigeria should strengthen the capacity of the National Agriculture Seed Council (NASC) to continue to carry out the necessary regulatory functions for quality and seed assurance.

Some Newly Released Cassava Varieties

The most recently released cassava varieties are presented below:

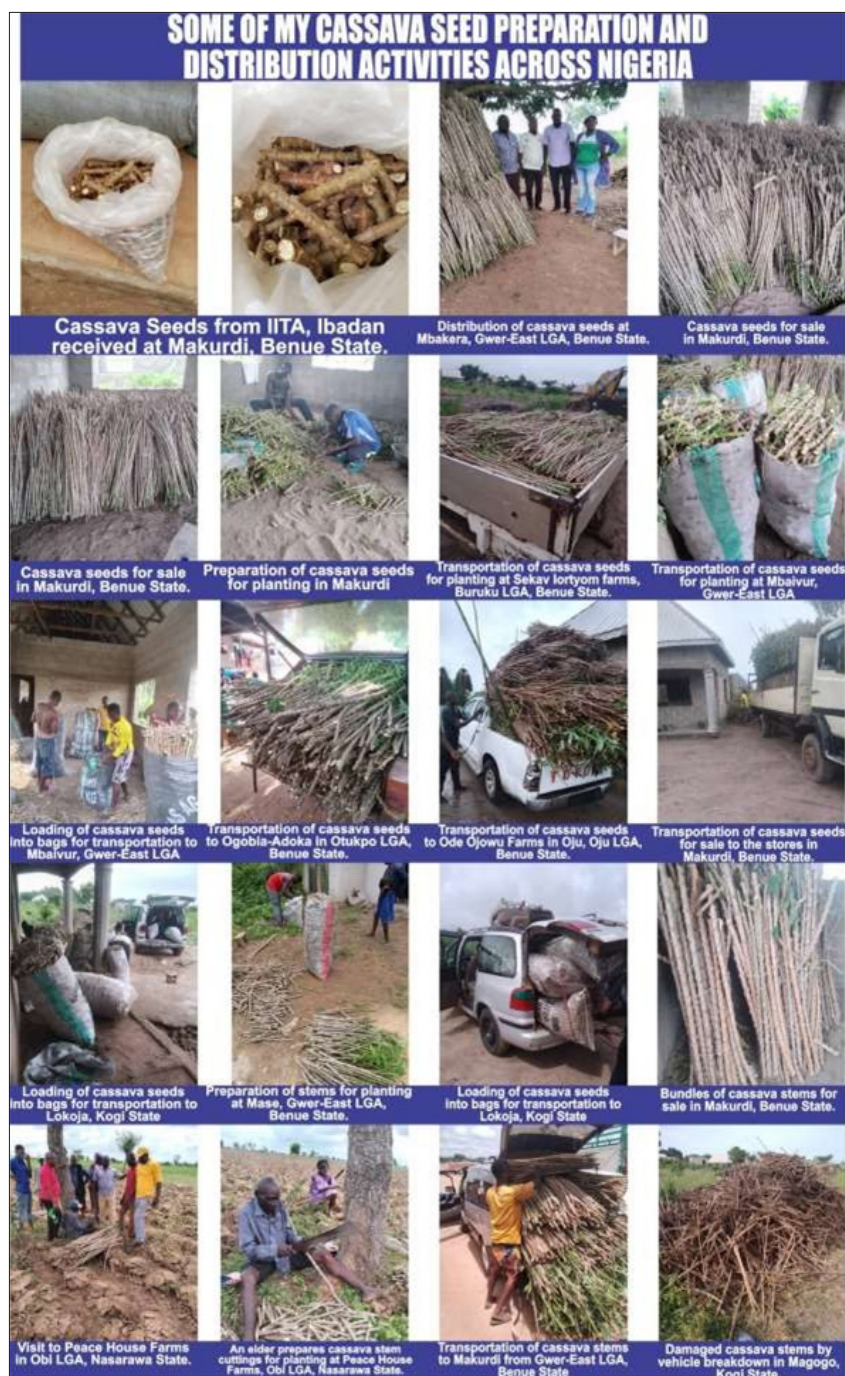
New High yielding Cassava Varieties				
Official Name	Promotional Name	Yield (t/ha)	Dry Matter Content (%)	Maturity Period (Months)
CR 36-5	Ayaya	35	40	10-12
IBA 961632	Farmer's pride	35	39	10-12
IBA 980505	Fine face	34	35	10-12
IBA 070593	Sunshine	30	30	10-12
TME 419	TME419	36	40	10-12
TMS13F1160P0004	Game changer	38	44	10-12
TMS13F1343P0022	Obasanjo-2	38.7	40.7 (starch, 28.6)	10-12
NR130124	Hope	40.1	33.2 (starch, 24.3)	10-12
TMEB693	Poundable	32	38	10-12
IBA 980581	Dixon	35	35	10-12
TMS 000070	Baba-70	37.5	38.5 (starch, 28)	10-12

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SOME OF MY CASSAVA SEED TRAINING WITH FARMERS ACROSS NIGERIA.



Mbaivur, Gwer-East L.G.A.



Dan-Anacha,
Taraba State



BNARDA Office,
Makurdi.



Mbakera,
Gwer-East L.G.A.



Obi LGA,
Nasarawa State



BNARDA Office,
Makurdi.



Kimbis Hotel,
Makurdi.



Mbakange, Mbayegh/Mbakyer,
Ward, Konshisha L.G.A.



Eyah's Hotel, Makurdi.



JOSTUM, University,
Makurdi.



Amile Community,
Konshisha LGA



Akure,
Ondo State.



Amile Community,
Konshisha LGA



Palm Garden Hotel
Makurdi.



Obi LGA,
Nasarawa State.



Lafia,
Nasarawa State.



Yandev, Gboko,
Benue State



Bureau for Local Govt. &
Chieftaincy Affairs, Makurdi



JOSTUM University,
Makurdi.

SOME OF MY FIELD VISITS TO FARMERS' FARMS ACROSS NIGERIA.



Nasarawa-Eggon,
Nasarawa State.



Lafia,
Nasarawa State.



Nasarawa-Eggon,
Nasarawa State.



Mbakya, Makurdi,
Benue State.



Amile, Shangev-Tiev,
Konshisha LGA



Laminga, Keffi,
Nasarawa State.



Tse-Kwembe,
Makurdi, Benue State.



Tse-Kwembe,
Makurdi, Benue State.



Alowagana, Assakio,
Nasarawa State



Alowagana, Assakio,
Nasarawa State



Fertilizer Distribution for SASAKAWA at Amile, Community,
Shangev-Tiev, Konshisha LGA, Benue State.



Tse-Kwembe,
Makurdi, Benue State.



Obi LGA,
Nasarawa State.



North Bank, Makurdi,
Benue State.



Utur Community,
Makurdi, Benue State.



Tse-Kwembe,
Makurdi, Benue State.



Tse-Kwembe,
Makurdi, Benue State.



Shanna, Gwer-East,
Benue State.



Mbakange Community,
Konshisha, Benue State.



Tse-Kwembe,
Makurdi, Benue State.

SOME OF MY COLLABORATIONS WITH FARMERS ACROSS NIGERIA.



With SASAKAWA in Lafia, Nasarawa State.



With Benacres in the lab in Makurdi



With Indorama Fertilizers, Makurdi



Receiving Indorama Soil Doc gift in Makurdi



With Federal Grain Reserves, Makurdi



With SASAKAWA in Gboko, Benue State



With SASAKAWA in Makurdi



With SASAKAWA in Makurdi



With Indorama fertilizer in Makurdi



With Indorama fertilizer in Makurdi



With Peace House Farm, Lafia, Nasarawa State



With SASAKAWA in Gwer-East, Benue State



With Indorama for Safety boots Distr. in Makurdi



With Benue State Min. of Agric., Makurdi



With UN Women in Jalingo, Taraba State



With IITA at Akure, Ondo State.



With IITA at Akure, Ondo State.



With Divine Open Doors Women Coop. in Buruku LGA, Benue State.



With Benue ADP, BNARDA in Makurdi, Benue State.

SOME OF MY OTHER CASSAVA RELATED ACTIVITIES/VISITS



Cassava harvesting in Tse-Kwembe, Makurdi



Cassava harvesting in Tse-Shigh, Makurdi



Cassava harvesting in Tse-Shigh, Makurdi



Cassava harvesting in Tse-Kwembe, Makurdi



Donation of school desks to LGEA, Sule Tyough and Dabur after cassava sales in Mbakange, Mbayegh, Konshisha LGA, Benue State



Building of Cassava House in Makurdi, Benue State.



Visit to Nigerian Breweries Ltd. in Lagos, sponsored by IITA, Ibadan



Public Enlightenment on Radio Benue, Makurdi



Training of Extension Agents at BNARDA, Makurdi



Akpu Market in Igbor, Gwer-East LGA, Benue State



New 5 hectares of cassava farm at Shanna, Gwer-East LGA.



Local processing of cassava at Amile, Konshisha LGA



Transportation of cassava roots for sale at Pure Biotech, Makurdi



Preparation of manure for cassava farm at Asukunya, Tarka LGA, Benue State.



Built a house after cassava sales in Mbakange, Mbayegh/Mbakyar, Gaav, Konshisha LGA.



Visit to Government House, Makurdi for Cassava advocacy



International Passport for Cassava journeys

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