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RESEARCH ARTICLE

Profitabilities and Challenges of Provitamin a Cassava Production Enterprise in Nigeria

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ABSTRACT

Bio-fortified cassava variety also known as Vitamin A cassava was developed through convectional breeding similar to most other improved varieties cultivated by Nigeria farmers. African countries produce over 103 million metric tons of cassava per annum with Nigeria accounting for approximately 35 million metric tons per annum. Vitamin A deficiency is an important micronutrient deficiency, particularly in Asia and Sub-Saharan Africa, affecting children and pregnant women to be specific. In the Democratic Republic of African countries with emphasis on the Democratic Republic of Congo and Nigeria, malnutrition and infant mortality are among the highest in the world. According to research carried out in 2003, the prevalence of vitamin A deficiency among children under five was about 60% and Pro-Vitamin A Cassava holds great potential for providing substantially increased amounts of Vitamin A diets as existing cassava varieties have beta-carotene concentrations between <1 µg and more than 15 µg. Despite the potential of Vitamin A cassava in addressing the increasing food demand and malnutrition among the growing population in Nigeria, studies by the International Institute of Tropical Agriculture have shown that one of the barriers to the uptake of new technology among the rural households is usually lack of empirical knowledge about the yield and return on investment. In this article, we addressed the issues of Profitabilities and Challenges to Provitamin A Cassava Production Enterprise in Nigeria.

Key words: Cassava production, challenges, enterprise, farmers, profitabilities

INTRODUCTION

Cassava (*Manihot esculenta*) production is important to the economy of Nigeria as the country is the world's largest producer of the commodity. The crop is produced in the 36 states of the country. The average yield per hectare is 10.6 tons. Cassava was introduced to West Africa from Central America and North-Eastern Brazil by slave merchants about the 16th century ago, in Africa and Nigeria in particular (Oludayo, 2015). In Nigeria, cassava production is well-developed as an organized agricultural crop. It has well-established multiplication and processing techniques for food products and cattle feed. There are more than 40 cassava varieties used in Nigeria. It is the only crop whose production level has tripled over the past 50 years while its development has been further advanced in the continent by the activities of the International Institute of Tropical Agriculture (IITA) and National Root Crops Research Institute Umudike, Nigeria. IITA has distributed more productive new varieties that are resistant to a number of diseases as well as drought. African countries produce over 103 million metric tons of cassava per annum with Nigeria accounting for

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approximately 35 million metric tons per annum (FAOSTAT, 2009; Oludayo, 2015).

In order to grow healthy cassava, improved package of practices relating to plant production and protection is required. These include site selection, soil improvement, variety and planting materials selection, planting and post-planting measures against weeds, pests, and diseases. Cassava is grown throughout the tropical low land. It is regarded as a benchmark for food security in the sub-Saharan Africa. It is ranked second to maize in terms of calorie intake (FAOSTAT, 2009). Cassava grows in different types of soils including marginal soil that cannot support the growth of most crops (Asadu, 2004; Oludayo, 2015). This good attribute of cassava enables it to have a comparative advantage over other tropical crops. It can be processed into many forms such as "garri," cassava chips, flour, bread, starch, and beer, among others. It is worthy to note that rural small-scale farmers are widely involved in cassava production in Nigeria and these farmers use low-level production techniques. They are constrained to adopt improved technologies in cassava production. Other constraints include inaccessibility to credit facilities, illiteracy, small farm size, inadequate access to agricultural information such as market product prices, input prices, high-interest rates, and poor market and rural road networks (Kuye, 2015; Oludayo, 2015).

In Nigeria, cassava is mainly produced for home consumption and for sale in the village markets since the bulk of it is produced by small-scale farmers. But, as a result of its multiple uses, and its large production level in the country, the Federal Government of Nigeria during the regime of President Olusegun Obasanjo introduced the Cassava Expansion Programme to further boost the production of cassava cultivation in the country (Oludayo, 2015). In order to increase Nigeria's foreign exchange, cassava is regarded as one of the non-oil export crops. The federal government further embarked on measures to ensure that cassava exportation is given serious attention.[1-10]

Bio-fortified cassava variety popularly known as Vitamin A cassava was developed through convectional breeding similar to most other improved varieties cultivated by Nigeria farmers (Akinwumi, 2011). The varieties that were released by the National Variety Release Committee of Nigeria are; UMUCASS 36, UMUCASS 37, and UMUCASS 38; and are recognized as IITA genotypes TMS 01/1368, TMS 01/1412, and TMS 01/1371. These were developed by the IITA in partnership with the National Root Crops Research Institute Umudike, Nigeria using traditional breeding methods in a HarvestPlus- funded project. The development and delivery of Vitamin A cassava in Nigeria has been ongoing for more than a decade and it is intended to complement existing national strategies in combating nutrient deficiency (Ogunleye, Bamire and Awolola,2019). Despite the potential of vitamin A cassava in addressing the increasing food demand and malnutrition among the growing population in Nigeria, studies by IITA (2011) have shown that one of the barriers to the uptake of new technology among the rural households is usually lack of empirical knowledge about the yield and return on investment. In this paper, we addressed the issues of Profitabilities and Challenges of Provitamin A Cassava Production Enterprise in Nigeria.

GOVERNMENT'S EFFORTS ON CASSAVA INITIATIVES AND SHORTFALLS

In order to promote self-sufficiency, the government promoted the use of cassava while curtailing rice and wheat imports (The Guardian, 2013). According to a Nigerian Presidential Initiative of July 2002, the cropped area of cultivation of cassava was proposed to be increased to 5 million hectares by the end of 2010 with a projected annual yield of 150 million tons resulting in an annual export earnings of US$5 billion. An adopted innovation is the introduction of vitamin A-rich cassava. The Federal Government of Nigeria launched a project to introduce pro-Vitamin A cassava varieties to 1.8 million farmers in the country (HarvestPlus, 2013) The 2002 Presidential Initiative by former president, Olusegun Obasanjo, on composite cassava flour was, however, reversed even before it reached maturity by his successor, President Umaru Musa Yar' Adua (Okpetu, 2012). Obasanjo's initiative became stillborn owing to the fact that his policy lacked a legislative bill that will survive any government policy. Based on this, Boma Angar and Hon. Commissioner Of

Agriculture, Ogun State, Engr. Ayo Olubori were of the strong opinion that the new FG Cassava Initiative by President Goodluck Jonathan will suffer the same fate as the old one except backed by a legislative bill (Okpetu, 2012).

PROFITABILITIES OF PRO-VITAMIN A CASSAVA ENTERPRISE

Cassava, which is rich in starch in the form of carbohydrates, has multiple uses. It is consumed in many processed forms, in the industry and also as livestock feed Adeniji *et al*. (2005). Roots or leaves are made into flours. Flours are of three types, yellow garri, white garri, or intermediate color, with yellow garri considered the best product in Nigeria. Its other products are as dry extraction of starch, glue, or adhesives, modified starch in pharmaceutical as dextrines, as processing inputs, as industrial starch for drilling, and processed foods.

According to HarvestPlus (2010), Vitamin A deficiency is an important micronutrient deficiency, especially in Asia and Sub□Saharan Africa, affecting children and pregnant women in particular. In the Democratic Republic of African countries with emphasis on the Democratic Republic of Congo (DRC) and Nigeria, malnutrition and infant mortality are among the highest in the world. According to a national survey carried out in 2003, the prevalence of Vitamin A deficiency among children under five was about 60%. Pro-Vitamin A Cassava holds great potential for providing substantially increased amounts of Vitamin A diets as existing cassava varieties have beta□carotene concentrations between <1 μg and more than 15 μg. Cassava with high beta-carotene can be visibly distinguished from normal cassava by its yellowish color. Cassava leaves are widely consumed as fresh vegetables. Their leaves contain proteins and many Vitamins including Vitamin A. A survey of the markets in Kinshasa showed the following breakdown for the various cassava products available: 26% is flour for making fufu, 23% is chikwangue, 19% is fresh cassava leaves, and 15% is fresh cassava roots. The main precursor for making flour for fufu is cassava chips, which are commonly found on the market. Only 4% of cassava products are not for human consumption and are used as animal feed. Cassava rootstocks are locally marketed and generate income for farmers. Global demand for Cassava products (flour, starch, ethanol, chips and pellets) runs into several billions of dollars in transaction value with China leading the demand pack at 60% of total imports (Business a.m., 2019). Other cassava import destinations could be found in North America, Europe, and so on. The local demand value for cassava is projected to hit over $8 billion in 2022 while global value for exports was put at $51 billion as at 2013 (Business a.m., 2019). Cassava industry is still very attractive, both locally and globally. Cassava has both traditional and industrial application. Traditionally, it is consumed as food in form of fufu or further processed into garri for consumption. The industrial application for cassava includes the production of starch, high-quality cassava flour, ethanol, cassava chips, and dried pellets. Cassava leaves are nutritious vegetables and can be used as animal feed. The stem can be sold as planting materials. There is also large importation of processed starch which is sold by various supermarkets, as well as ethanol and other cassava derivatives into Nigeria. These are opportunities for local investments. Agricultural production, marketing, and trade serve as major sources of employment, income, and foreign earnings before Nigeria became independent. Cassava production sector provided the basis for the agro–industrial development and contributed significantly to the commercialization, monetization, and integration of rural sector.[11-19]

Vitamin A cassava varieties have a high potential to reduce poverty and malnutrition among the smallholder farm households in Nigeria. Biofortified Vitamin A "yellow" cassava can help address the adverse health effects of Vitamin A deficiency. By 2016, HarvestPlus and its partners had successfully developed and delivered Vitamin A cassava varieties to more than one million farming households in Nigeria and the DRC. HarvestPlus has established the proof of concept that Vitamin A cassava varieties can be developed without compromising yield levels and that these varieties are widely accepted. The delivery program has shown that farmers are willing to grow Vitamin A cassava varieties and consumers are willing to buy and eat Vitamin A cassava products (Ilona *et al*., 2017).

CHALLENGES OF PRO-VITAMIN A CASSAVA PRODUCTION ENTERPRISE IN NIGERIA

The challenge of provitamin A cassava is the inability of the stem cuttings to meet its targeted population of farmers' participation. The shortage of the stems among the farmers makes some not interested provitamin A cassava production.

Literacy levels of farmers in particular make them shy away from opportunities provided by the IITA and NRCRI.

Inadequate funding: The high-interest rate demanded by most of the financial institutions made it difficult for the farmers to access credit facilities as the loans were unattractive. The major challenge was in the interest rates, rather than willingness to serve. Lack or poor access to credit has been cited in several studies (Doss, 2003; Acheampong, 2015) as a key constraint limiting new technologies/improved seeds for increased production.

High cost of transporting fresh roots from farm to processing centers/home and then to the markets due to bad road network is affecting cassava production. This position was corroborated by the findings of Akinnagbe (2010) and Olaosebikana *et al*. (2019).

Lack of improved mechanized cassava processing equipment. Large percentage of harvested cassava roots are processed into garri with simple implements, especially in some Nigerian communities.

Inadequate infrastructure and technology: This has resulted in the continued classification of smallholder as subsistence with low production capacity and income. Hence, a cassava smallholder is mainly interested in selling his roots as fast as possible, while processing just enough for the subsistence of the farm family (Oruonye *et al*., 2021).

High cost of production: The high cost of good stems, labor, and farming equipment are the major constraint to the quality of cassava produced. However, many farmers cannot afford to buy the equipment which will increase their yield output.

Activities of middlemen: The high handling charges by the middlemen affect the price of the cassava and also control the market.

Inadequate funding of research work: Lack of funds in carrying out research work on cassava inhabits the findings of solutions to the problems faced by farmers. There is a need to encourage more research work on the poor variety of stems that is currently used by farmers. The existing research center established by the government for root and tuber research such as National Root Crops Research Institute, Umudike and IITA, Ibadan should be strengthened to achieve their mandate.

Poor disease and pest management: The management of disease and pest that affect sweet potato is one of the major problems that farmers face as it reduces their cassava yield and may even destroy the crop once the farm is affected.

CONCLUSION AND RECOMMENDATIONS

Policies that would bring about reliable demand and strengthen cassava value-added chains are essential for agricultural sustainability as a result of the above, this paper used available findings to review: government's efforts on cassava initiatives and shortfalls, profitabilities of pro Vitamin A cassava production enterprise and the challenges of pro Vitamin A cassava production enterprise in Nigeria. Some of the challenges include inadequate funding, lack of adequate support to the marketing component, lack of improved mechanized cassava processing equipment. Recommendations based on this, the following recommendations were suggested; Support for marketers more in terms of capacity building, market information, and linkages to sources of finance for access to credit should be pursued with enthusiasm. Financial linkages, there is a need to source for friendly financial institutions that can grant credit facilities at very low and favorable interest rate of 2%. More cassava processing centers should be established in the different 36 states of the country, Nigeria. Cassava producers should be trained on cassava waste management to avoid excess wastage of the produce.

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