

A decade (2002 – 2012) of presidential intervention on cassava in Nigeria; the successes and challenges

Abstract

Agriculture used to be the mainstay of Nigeria before crude oil was discovered in commercial quantities in 1956. (And due to the oil boom of the early 1970s, the country neglected agriculture in preference to oil. The country soon became a major importer of food particularly wheat and rice to the detriment of the country's economy.) However, Nigeria neglected agriculture in preference to oil due to the oil boom in the early 1970s, resulting in the country to become a major importer of food, particularly of wheat and rice to the detriment of the country's economy. Hence, the government of Nigeria, a comma which wished (wishes) to reduce the food importation bill of the country, pursued a presidential intervention on cassava (PIC) programme. The government created policies that supported the industrialization of cassava, a comma such as 10% cassava bread policy, 10% bioethanol in gasoline and replacement of paraffin (household cooking fuel) with ethanol gel fuel as the cooking fuel. The paper presented both the success and challenges of the PIC in Nigeria. The PIC brought massive investment and employment in the cassava subsector, reduction in (Nigeria's) the food import bills of Nigeria , no comma and increase in cassava yield from 10.8 t/ha to 20 t/ha. As a result, Nigeria became the largest producer of cassava in the world. (But) However, the PIC led to some problems, such as the expansion of cassava farm into virgin forest, cassava gluts in some areas of the country (and) whereas scarcity in other areas, no comma and increased (production) amounts of cassava processing wastes which were among the challenges of the policy.

Key words

Automotive biofuel, cassava bread, cassava industrialization, ethanol gel fuel, food policy

1 Introduction

Agriculture used to be the mainstay of Nigeria before the discovery of oil in commercial quantities in the country. (From 1961 – 1970,) Agriculture contributed to (on the average) about 50% of the GDP on the average with an annual growth rate of 4.5% between 1961-1970. (CBN, 2010). However, the attention of the government was diverted to oil and gas by the oil boom in the early 1970s. (But in the early 1970s, when oil boom occurred in Nigeria, attention of the government was diverted to oil and gas.) Hence, (during the period of 1981 – 1990,) the average agricultural GDP was 25.7% while the annual growth rate declined by 2.6% during the period of 1981-1990 (,) no comma and (from 1991 – 2000,) the agricultural GDP rose to 40.4% with an annual growth rate of 4.1% during 1991-2000. (CBN, 2010). (From 1960s up till the oil boom of the early 1970's,) Nigeria was self sufficient in most food commodities and even exported some food stuff and raw materials, a comma such as (oil palm) palm oil, cocoa, groundnut, no comma and rubber from 1960s to the oil boom of early 1970s. However, Nigeria became a net food importer by 1975. (But by 1975, Nigeria became a net food importer) (Mokwunye, 2010).

From the oil boom era of the **1970s (1970's and up till now) until now**, the oil and gas sectors **have (has) taken over (over taken)** agriculture and **have (has)** become the major contributors to Nigeria's GDP. Nigeria became solely dependent on oil **(to the neglect) at the expense** of agriculture and other sectors. Nigeria became a net food importer spending ₦ 62.7 billion (\$ 1 = ₦160) **(from 1991 – 2000)** on food importation **between 1991-2000. (But)** Nigeria's crude oil resources are located in the Niger Delta region. The over 60 years of oil and gas exploration in the Niger Delta, **no comma** has led to political agitation due to inequitable proceeds sharing, **no comma** and environmental degradation. Ethnic militias **(emerged,)** which threatened the oil and gas sectors **emerged**. Militias are involved in community conflicts, kidnapping especially of oil workers and illegal bunkering/stealing of crude oil and petroleum products causing oil pollution in the process (Nodu and Ohimain, 2014). The activities of these militants have led to loss of crude oil and refined petroleum products, loss of revenue due to deferred production and cost of repair of damaged facilities. Sometimes the country is unable to meet **(her) the** supply target based on OPEC's quota. As a result of the general insecurity, some major multinational oil producing companies have started divestment from the country.

Threatened by the activities of ethnic militias, Nigeria wishes to diversify **(her) the** economy **(.) by returning to agriculture to boost the economy and engage the youths. (The country wishes to return to agriculture to boost the economy and engagement of the youths.)** Unlike petroleum resources that are physically located in Niger Delta, agriculture is widespread. Moreover, the rate of unemployment in Nigeria was 23.9% in 2012 (Elemo, 2013; Adebile, 2012). Hence, agriculture was considered as a viable option for the creation of massive employment opportunities. **(In 2002,)** The government of President Olusegun Obasanjo (1999 –2007) launched the Presidential Initiative on Cassava (PIC) among other crops **in 2002**. The PIC **(aimed) aims** at generating ₦5 billion annually from **the** exportation of cassava products (pellets, starch and chips) while diversifying the domestic use of cassava. The strategy is to develop the domestic market and create national policies for cassava development (Knipscheer et al., 2007). Cassava **(was) is** promoted as a poverty fighter. The PIC **(was) is** designed to develop domestic industries for the production of value added products including ethanol, glucose syrup and adhesives to encourage rural industrialization and rural job creation (Awoyinka, 2009). Hence, the aim of this study is to assess the effect of the PIC after 10 years of operation.

2 Policy frameworks

The government actively pursued policies and **(programs) programmes** that could create demand for cassava products. Some of the notable policy interventions and **(programs) programmes** include:

2.1 Cassava bread policy

The government mandated the flour milling industries and bakeries to **(incorporate) contain** 10% cassava flour into all bread produced in Nigeria. Implementation of **(his) this** policy created a demand of 250,000 tonnes of high quality cassava flour (HQCF) **,no comma** which will require about 1 million tonnes of cassava tuber annually (Ohimain, 2014a, Ohimain, 2014b, Ohimain, 2014c). The current government of

President Goodluck Jonathan is implementing 40% cassava bread policy, **no comma** which **(could) can** require 5.2 million tonnes of cassava tubers.

2.2 Automotive biofuel policy 2007

The government mandated the **(Nigeria)** National Petroleum Corporation **of Nigeria** (NNPC) and **(her) its** subsidiary, **a comma** the Petroleum Product Marketing Company (PPMC) to distribute gasoline containing 10% bioethanol (E10). This policy **(could) can** create a demand of 1.3 billion litres of fuel grade ethanol annually (Ohimain, 2010), which **(could) will** require over 3.6 million MT of cassava if half of the bioethanol will be produced from cassava feedstock. Furthermore, 16.33 **million tonnes of cassava, 1.43 million tonnes of sweet sorghum and 15.48 million tonnes of sugarcane** which are equal to 33.24 **million tonnes of raw materials are required per annum in order to produce the 2.66 billion litres of fuel grade ethanol per annum by the first generation bioethanol projects under construction in Nigeria.** (Ohimain, 2010) **(in order to produce the 2.66 billion litres of fuel grade ethanol per annum by the first generation bioethanol projects under construction in Nigeria,) the following quantities of feedstock are required per annum cassava 16.33 million tonnes, sweet sorghum 1.43 million tonnes and sugarcane 15.48 million tonnes, which equal 33.24 million tonnes of raw materials per annum)** .

2.3 Replacement of paraffin **(cooking fuel)** with ethanol gel **(fuel)** as the cooking fuel

The government of Nigeria planned to replace paraffin **(cooking fuel)** with bioethanol **as the cooking fuel**. This will create a demand of 3.75 billion litres of ethanol (Ohimain, 2010, 2012; Azih, 2007; Awoyinka, 2009), **no comma** which **(could) can** require nearly 21 million MT of cassava tuber since the ‘cassakero project’ was designed for the production of ethanol gel fuel from cassava feedstock (Ohimain, 2012, 2013).

2.4 Nigeria cassava master plan 2006

A strategic action plan for the development of **(the)** Nigerian **assava** industry was developed (UNIDO/FGN, 2006). The master **(plaplan) plan/preplan** articulates the plan of the government towards the diversification of **(the)** cassava subsector.

3.0 Materials and Methods

The study relied heavily on secondary data including published literatures, government publications, pronouncement and official statistics. The **report of** Central Bank of Nigeria (CBN, 2010) **(report)** which assessed the PIC from 2001 – 2007 **period** was reviewed extensively and the findings **are** summarized in Tables 1 and 2. **(while)** Information covering **the period** up to 2012 was obtained from other literature sources. Additional information was **(also)** obtained from other sources.

Table 1: Objectives, targets and strategy for implementation of PIC

Aspects	Issues considered
Objectives	• Ensure poverty alleviation; • Promote import substitution through the local production of value-added products like starch, glucose, syrup, etc; • Diversification of the Nigerian economy • Promote rural industrialization; and • Ensure increased income to farmers
Strategy	• establishment of Federal, State and Local Government Implementation Committees; • production of 9.2 million bundles of breeder stock by NRCRI* Umudike; • production of 73.2 million bundles of foundation stock by RTEP*; • production of 20 million bundles certified stock by state ADPs*; • training of fabricators of processing machinery; • conduct of programme facilitation and sensitization workshops for cassava producing states; • establishment of farm gate processing centres for the production of value-added cassava products; • collaboration with relevant ministries, parastatals and agencies in the legislation and actualization of 10 per cent flour policy; • advocating interest on loans to be pegged at not more than 8% per annum; • market development through trade missions, publicity and exhibitions/trade fairs; and • procurement of tractors/equipment, amongst others, for concessionary access to farmers

	• 21 artisanal equipment fabricators were trained at the National Centre for Agricultural Mechanization (NCAM) in the fabrication and production of processing machinery such as cassava peelers, chipping machine and manual harvester; • increased private sector investment in large-scale cassava plantation; and • trade missions were undertaken to Latin America, Europe, six African countries and China to source for market for cassava products
Achievements	• increased annual cassava production from 31.7 million tonnes in 2003 to about 49.0 million tonnes in 2006; • over 5,000 tonnes of cassava flour had been supplied by flour producers to flour millers under the 10 per cent cassava policy as at December 2006; • prior to the take-off of the initiative on cassava production and export, about 90% of the cassava produced was consumed as food. 2,500 tonnes of cassava chips worth N55 million was exported to China by Ladmoks Nigeria Ltd in 2006; • increased private sector investment in the cassava downstream sector, as exemplified by Ekha Agro Farms (glucose syrup), Ogun State, Nigerian Starch Mills, Ihiola, Anambra State and Vesa Farms (Flour) Benin City, to mention a few; • two (2) farm gate primary processing cassava centres established in Benue and Oyo States, while six others were being re-allocated to new beneficiaries; • increased foreign investment typified by the; Dutch Trading Company (DATCO) in Benue State for cassava flour production; and Thai Farm International • Improvement in the design and development of processing equipment by both the mainstream (e.g. Haniga, Nova, Tropical, Peak Products) and institutional fabricators (like NCAM).
Challenges	• There has been an increased production of cassava as a result of the activities of the Initiative without commensurate rise in processing facilities and market outlets, leading to lower prices and glut. • Inadequate market information linking farmers and end-users. This also accounted for the glut being experienced by cassava producers. • Inadequate supply of improved planting materials to meet demand. • Lack of specialization in the cassava chain, consequently, everybody seems to be doing everything at the same time i.e. producing, processing and marketing. • Misconception about the programme, as most farmers were under the impression that the government was going to buy up all produce. • Inadequate access to credit and slow disbursement where credit is available. • Cost of production is high due to low level of mechanization and low yield as a result of adherence to cultural practice (plant population) and non-application of modern technology and improved seedlings.
Overcoming the challenges	• Massive investment by the State and Local Governments in the establishment of farm gate processing centres, especially at the initial stage. • The private sector in their backward integration efforts should empower outgrower farmers through the provision of processing machinery to produce value-added products e.g. chips, flour, etc. • There is need for improved dissemination of market information to farmers, processors, marketers and end-users. Information should be updated from time to time. • SMEDAN (Small and Medium Scale Enterprise Development Agency) should assist the small-and medium-scale producers and marketers by providing entrepreneurship development training.

Table 2: Action taken, achievements and challenges of PIC

Aspects	Issues considered
Actions taken	• establishment of the National Cassava Development and Technical Committees; • Establishment of State Implementation Committees by Delta, Edo, Enugu, Kaduna, Kogi, Niger and Osun States; • 3,000 improved cassava planting materials supplied to the Republic of Senegal; • One (1) set of cassava processing machinery supplied to the Republic of Sierra Leone; • official release of five (5) improved varieties of cassava selected from 43 varieties screened under the Pre-emptive Management of Cassava Mosaic Disease (CMD) to farmers; • Literature/sensitization materials: 15,000 cassava production and 7,500 processing manuals and 15,000 posters produced and distributed to farmers' organizations and NGOs for distribution to their members in the states; • 60 ha planted by NRCRI to produce 24,000 bundles of breeder stock; • 80 ha planted by RTEP to produce 32,000 bundles of foundation stock; • 148 ha planted by state ADPs to produce 59,200 bundles of certified stock; • programme facilitation and sensitization workshops held at Moore Plantation (Ibadan, Oyo State), Confluence Hotel (Lokoja, Kogi State) and National Water Research Institute (Kaduna, Kaduna State); • 500 extension agents from the south-west, south-east, and north-central were trained at Akure and Minna;

	21 artisanal equipment fabricators were trained at the National Centre for Agricultural Mechanization (NCAM) in the fabrication and production of processing machinery such as cassava peelers, chipping machine and manual harvester; - increased private sector investment in large-scale cassava plantation; and - trade missions were undertaken to Latin America, Europe, six African countries and China to source for market for cassava products
Achievements	- increased annual cassava production from 31.7 million tonnes in 2003 to about 49.0 million tonnes in 2006; - over 5,000 tonnes of cassava flour had been supplied by flour producers to flour millers under the 10 per cent cassava policy as at December 2006; - prior to the take-off of the initiative on cassava production and export, about 90% of the cassava produced was consumed as food. 2,500 tonnes of cassava chips worth N55 million was exported to China by Ladmok Nigeria Ltd in 2006; - increased private sector investment in the cassava downstream sector, as exemplified by Ekha Agro Farms (glucose syrup), Ogun State, Nigerian Starch Mills, Ihiala, Anambra State and Vesa Farms (Flour) Benin City, to mention a few; - two (2) farm gate primary processing cassava centres established in Benue and Oyo States, while six others were being re-allocated to new beneficiaries; - increased foreign investment typified by the; Dutch Trading Company (DATCO) in Benue State for cassava flour production; and Thai Farm International - Improvement in the design and development of processing equipment by both the mainstream (e.g. Haniga, Nova, Tropical, Peak Products) and institutional fabricators (like NCAM).
Challenges	- There has been an increased production of cassava as a result of the activities of the Initiative without commensurate rise in processing facilities and market outlets, leading to lower prices and glut. - Inadequate market information linking farmers and end-users. This also accounted for the glut being experienced by cassava producers. - Inadequate supply of improved planting materials to meet demand. - Lack of specialization in the cassava chain, consequently, everybody seems to be doing everything at the same time i.e. producing, processing and marketing. - Misconception about the programme, as most farmers were under the impression that the government was going to buy up all produce. - Inadequate access to credit and slow disbursement where credit is available. - Cost of production is high due to low level of mechanization and low yield as a result of adherence to cultural practice (plant population) and non-application of modern technology and improved seedlings.
Overcoming the challenges	- Massive investment by the State and Local Governments in the establishment of farm gate processing centres, especially at the initial stage. - The private sector in their backward integration efforts should empower outgrower farmers through the provision of processing machinery to produce value-added products e.g. chips, flour, etc. - There is need for improved dissemination of market information to farmers, processors, marketers and end-users. Information should be updated from time to time. - SMEDAN (Small and Medium Scale Enterprise Development Agency) should assist the small-and medium-scale producers and marketers by providing entrepreneurship development training.

	- There is need for entrepreneurs to specialize in specific aspects of the cassava value chain either as producers, processors or marketers. - There is need for partnership between Nigerian entrepreneurs and foreign investors in the provision and operation of mobile processing units. - There is need for intensive mechanization to reduce cost of production.
--	--

Source: Compiled from CBN (2010) report with additional information from Philips et al (2004), Shima (2011), Knipscheer et al (2007) and UNIDO/FGN (2006)

4.0 Results and Discussion

In addition to the aims listed by the CBN (2010) (Table 1), other aims of the PIC include (Shima 2011):

- To expand primary processing and utilization of cassava produced in Nigeria to prevent glut.
- To identify and develop new market opportunities for import substitution and export.
- To stimulate increased public sector investment in cassava sector.

One of the major impacts of the PIC is the creation of new interest/attention on cassava. The federal government and many international donor agencies supported the project including the Food and Agricultural Organization (FAO), International Fund for Agricultural and Development (IFAD), UK Department for International Development (DFID), NEPAD and recently the Bill Melinda Gates Foundation. Many of these organizations funded research on improved cassava varieties, processing and strengthening of cassava value chain. Due to the huge publicity that followed the PIC, the interest of all Nigerians including consumers, farmers, processors and marketers was renewed.

(The government) Along with the development partners , **the government** funded research, development and demonstration projects as well as training on the fabrication of cassava processing equipment including graters, hydraulic press, hammer mills with cyclones, cabinet and flash dryers. The International Institute for Tropical Agriculture (IITA) and the National Root Crop Research Institute (NRCRI) led research in the development of improved cassava varieties. Under the **(pre-emptive) pre-emptive** management of cassava mosaic disease (CMD) project, 10 improved cassava varieties **which were selected from 43 high yielding cultivars** were officially released. **(These improved cassava varieties were selected from 43 high yielding cultivars and officially released.)** These improved cassava varieties were multiplied by several agencies including IITA, NRCRI, Root and Tuber Expansion Program (RTEP) and State Agricultural Development **Programmes (Programs)** (ADP) using certified stocks (Sanni et al., 2009). The PIC provided opportunities for partnerships in the agricultural sector. **(Also,) Moreover,** the IITA, NRCRI and Federal Institute for Industrial Research Oshodi (FFRO) led the research on **the** processing of cassava into various products including chips, pellets, starch, glucose syrup and high quality cassava flour (HQCF) for bread making (Elemo, 2013; Sanni et al., 2009). As a result of the PIC, the low average national yield of cassava (10.8 t/ha) doubled to 25 t/ha even without the use of agrochemicals (Sanni et al., 2009; Mokwunye, 2010; Tarawali et al., 2012). Mokwunye (2010) reported that **(between 1999 and 2006,)** cassava production rose by 44% **between 1999-2006** while Obasanjo (2008) reported **an increase of** 50% for the same period. The area cultivated and total cassava productivity also increased. **The** production of cassava rose from 32.7 million MT in 1999 **(through) to** 34.5 million MT in 2002 (Echebiri and Edaba, 2008) , **a comma** to 49.0 million in 2006 (Obasanjo, 2008) and **to** 54.4 million in 2012 (Elemo, 2013). **(which was lower than the 150 million MT targeted for 2010 (Philips et al 2004))** . Recent studies suggest that large scale farmers are increasingly adopting the improved cassava varieties (Tarawali et al., 2012). Increased production led to increased private sector investment in the sector (Mokwunye, 2010).

Through research and development, 6 new varieties of cassava **(possessing) having** pro-vitamin A (β Carotene) were released for bread making (Aniedu and Omodamiro, 2012), thus **(improving)** the nutritional quality of cassava bread **was improved**. The PIC generally improved food security because cassava production grew at 6% while the Nigerian population grew at 3% (Mokwunye, 2010). Due to the PIC,

cassava processing to value added products has increased in Nigeria. **Apart from traditional fermented food (garri and fufu),** various products made from cassava (**apart from traditional fermented food (garri and fufu)**) include ethanol, native and modified starch, chips and pellets, HQCF, adhesives and glucose syrup. Apart from bread (Ohimain, 2014a, Ohimain, 2014b, Ohimain, 2014c), instant noodles are increasingly being made from cassava (Sanni et al., 2007).

There have been massive investments following the PIC pronouncements. For example, over \$3.86 billion was invested in the construction of 19 large scale bioethanol refineries and 10,000 units of mini-refineries (Ohimain, 2010). Unfortunately, some of these projects have not been completed, **no comma** while others have been abandoned altogether perhaps because of less emphasis on bioethanol by the current government. Before the PIC, there were only 2 flash **driers (dryers)** installed in Nigeria for processing cassava tubers into HQCF. **(But following)** **After** the PIC, about 156 small-scale (2-4 tonnes HQCF/day) were installed in Nigeria. **Following the collapse of the 10 % cassava bread policy in 2007 due to the reluctance of the flour industry to accept HQCF for bread making, most of the flash driers (dryers) folded up. (But as at 2007 when the 10% cassava bread policy collapsed, due to the flour industry reluctance to accept HQCF for bread making, most of the flash dryers folded up.)** The flash **driers (dryers)**, which were locally fabricated, were faced with several challenges including frequent breakdowns, lack of spare parts and inefficient fuel consumption.

Consequently upon the PIC, Nigeria exported 2,500 million MT of chips to China valued at N 55 billion in 2006. **Nigerian food importation bills are declining due to increased domestic production. The CBN (2010) estimated that Nigerian food import bill, which used to be ₦ 62.7 billion in 1991 – 2006, was N 170 billion in the 2001-2006 period. (while Mokwunye reported \$ 2 billion in 2000, but in the period of 5 years (2001 – 2006) the country spent ₦ 170 billion on food importation)** (CBN, 2010). Employment in the agricultural sector is increasing **and** this trend is likely to continue since the current government of President Jonathan is building on the success of his predecessor, **no comma** and is even more **(ambitions) ambitious**. He has scaled up the percentage of cassava in composite bread from 10% to 40%. Elemo (2013) **(estimated) estimates** that if **(the)** 40% cassava bread policy is properly implemented, **(could create)** 3 million jobs **can be created** within the next 3 years. Awoyinka (2009) **(reported) reports** that Ekha Agro farms invested over ₦ 2.4 billion in glucose syrup plant. The company engaged over 300 cassava **out growers** for the supply of cassava tubers.

On the other hand, there are some constraints related to the PIC. One of the major challenges **(of the PIC)** is **(policy)** the inconsistency **of policy** especially between successive governments. President Olusegun Obasanjo (1999 – 2007) backed up the PIC with 10% cassava inclusion in bread policy **(,)** **while** President Umaro Yar'Adua (2007 – 2010) reduced **the ratio of 10 % to 5 %.** **(the policy to 5%, which was later abandoned in 2005 – 2007.) (But)** **Nowadays,** the current administration of President Goodluck Jonathan is **(now)** pursuing 40% cassava inclusion in bread policy. Another major challenge of the PIC is the price of cassava flour. **(From 2002-2007,)** **T**he factory gate price of wheat was ₦ 50,000 /t, **no comma** while that of cassava was ₦ 75,000/t **between 2002-2007**. Hence, the flour mills were reluctant to use HQCF, **no comma**

which (they) was considered as more expensive and inferior to wheat for bread making (Ohimain, 2014a). (But) However, the trend has reversed recently due to the application of more levies by the current administration and wheat flour now costs ₦ 140,000/t. (Wheat flour now cost ₦ 140,000/t.) Even though recent estimates suggest that HQCF can only be sold profitably at ₦81,250/t (Elemo, 2013), studies have shown that cassava products produced in Nigeria are uncompetitive in the world market. As a result, Nigeria could only export these products to China in 2005-2006 since cassava chips were subsidized by the government. (but recent estimates suggest that HQCF could only be sold profitably at ₦81,250/t (Elemo, 2013). But studies have shown that cassava products produced in Nigeria is uncompetitive in the world market; hence the country was only able to export to China in 2005/2006 when cassava chips were subsidized by the government.)

Conclusion

Cassava is the most important tuber crop in Nigeria. It is mostly processed into garri, a fermented roasted granule. The government of President Obasanjo intervened in the cassava sub-sector and promoted the industrialization of cassava by (releasing) producing policies which are targeted towards the (utilization of cassava for the production of diverse) production and diversification of cassava products including cassava flour and chips, cassava ethanol and gel fuel, cassava starch and glucose syrup. As a result, Nigeria became the largest producer of cassava in the last decade due to the presidential initiative on cassava.