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PROSPECTS FOR ENTREPRENEURSHIP IN THE YAM AND CASSAVA VALUE CHAINS OF NIGERIA: THE ROLE OF KNOWLEDGE IN DETERMINING FARMERS AND PROCESSORS ENGAGEMENT IN DIFFERENT ENTERPRISES

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ABSTRACT: *This study assesses the prospects for locally produced food and industrial products from cassava and yam in Nigeria and aimed to find out how knowledge of these products, their markets, and demand for them impacts on farmers and processors choices of enterprises to engage in. The descriptive survey design was adopted for this study. The multi-stage cluster sampling technique was used in selecting the sample for this study made up of 300 farmers and 300 processors from five top producing states of cassava and yam in Nigeria and a structured questionnaire served as the data collection instrument. Findings indicate that a very low percentage of farmers and processors have knowledge of secondary industrial products such as ethanol, glucose, dextrin, and adhesives and most of them engage only in the processing of food products targeted at domestic markets. Policies aimed at promoting upstream linkages between industrial users and farmers/processors to encourage knowledge spillover down the value chain and policies targeted at building the capacity of farmers/processors to engage in secondary processing were recommended as possible solutions to this situation.*

KEYWORDS: Knowledge; Entrepreneurship Prospects; Industrial products; Value chain.

INTRODUCTION

Cassava and yam are widely grown in Nigeria and are sources of income and food to millions of farmers, processors, and traders. Cassava was one of the crops that have received massive attention from the Nigerian government since 2011 as efforts are made to industrialize the agricultural sector and reduce dependence on crude oil. Nigeria became the world's biggest producer of cassava in 2013 accounting for more than 20% of total cassava production in the world (Food and Agricultural Organization 2014). Yam is among the major cash and food crop grown in West African states and Nigeria is the biggest producer and consumer of yam in the region and in the world (Nigerian Bureau of Statistics, 2012). According to International Institute for Tropical Agriculture (2013), yam production is one of the few very profitable ventures in Nigeria and more than 30% of Nigerians grow yam as a primary source of revenue irrespective of its high cost of production. The yam value chain, therefore, is very attractive to farmers (Izekor and Olumese, 2010). According to Verter & Becvarova (2014) and Nteranya (2015), Nigeria's yam production accounts for approximately 68% of global yam production making it the number one producer of yams in the world. Though Nigeria ranks first in cassava and yam production in the world with an output of 57 million tons and 44 Million tons respectively in 2016 as shown in Figure 1 below according to FAOSTAT (2016), the potential of the cassava and yam industry in Nigeria remains hugely untapped in many ways.

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According to PIND (2011), 90% of cassava and yam produced in Nigeria are processed as food while about 10% is used for industrial production. Less than 1% of the output is exported. One of the issues identified by the Nigerian Federal Ministry of Agriculture and Rural Development (FMARD 2016) in their policy document is the inability of the Nigerian agricultural sector to meet the quality requirement needed to be successful in export markets. This echoed the assertions by World Bank (2013) and FAO (2014) that Nigeria lacks the capacity to export in quantities and qualities desired in the international market. This inability is mostly driven by inefficiencies in the Nigerian agricultural system. With the renewed government interest in resuscitating the agricultural sector of Nigeria to yield revenue for the economy especially given the fluctuating prices of crude oil which is its number one export product, there are prospects for the agricultural sector. Cassava and yam are among the value chains that have attracted investment by the private sectors in Nigeria and have witnessed growth in production in the past decade as shown in figure 2. It is believed that they will continue to attract investment given their potentials as food security crops and importance as raw material for many industrial products. Though ranking first in the world in the production of cassava and yam, Nigeria is not among the top exporters of processed cassava and yam products in the world. Industrial users of cassava and yam products depend mostly on imports to meet their needs. It is possible that part of the reason for these farmers and processors lack knowledge of markets and industrial products demanded in these markets. Different authors have identified lack of adequate market information and poor dissemination of available information resulting in farmers and processors lack knowledge of the best markets for cassava products as a constraint in the marketing of these products (McNulty & Oparinde 2015; PIND 2011). This study, therefore, sought to identify the entrepreneurial prospects in these value chains and understand the role of knowledge of these prospects as a determinant factor for farmers and processors choice of engagement in new enterprises in the value chains. The study aimed to find out if knowledge of these prospects in terms of products, demand trend and markets determine the choice of food and industrial products processed and traded by farmers and processors.

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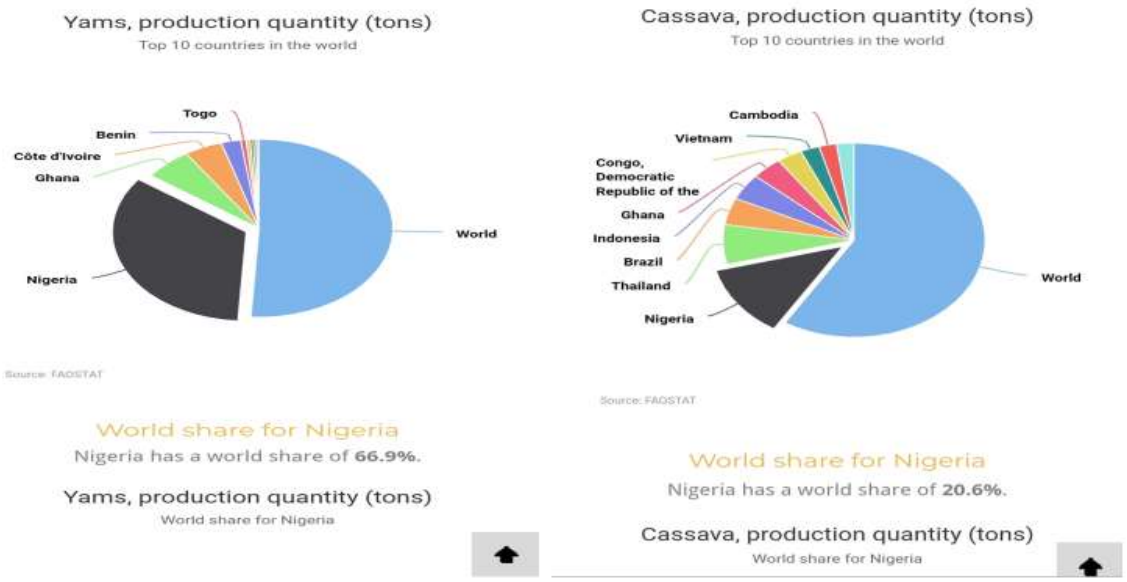

Figure 1: Nigeria's world share of cassava and yam production quantities.
Source: FAOSTAT (2016)

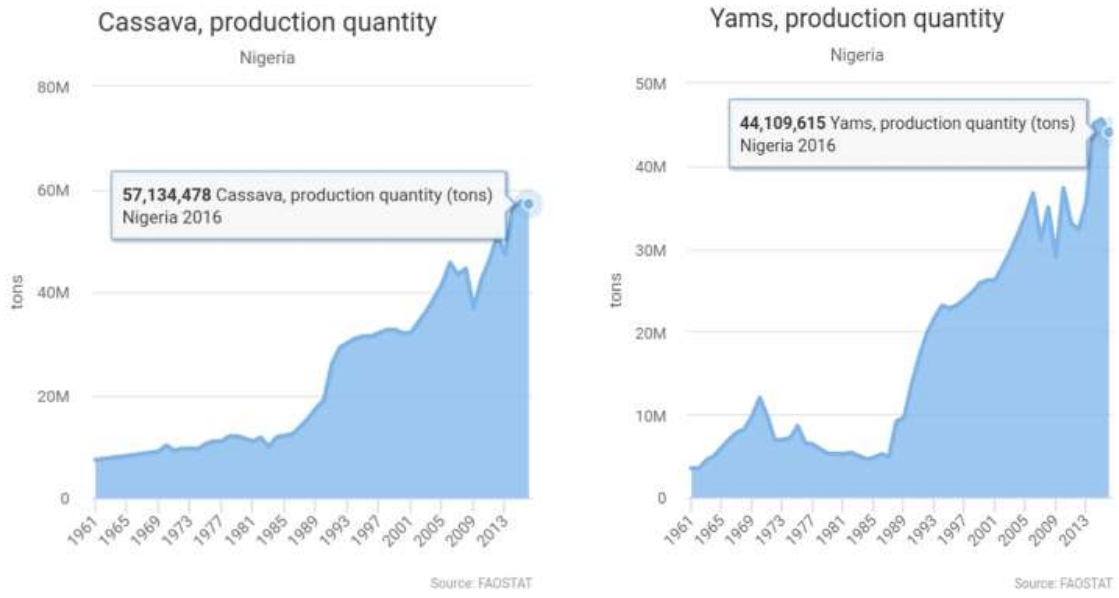

Figure 2: Cassava and yam production quantities in Nigeria
Source: FAOSTAT (2016)

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REVIEW OF PROSPECTS IN THE CASSAVA AND YAM VALUE CHAIN

The Nigerian cassava industry can potentially yield annual revenues above 28 billion Naira if it maximizes its production capacity and minimizes limiting constraints to small-holders (African Development Bank (ADB) 2015). Industrial processing of cassava has four rapidly growing emerging markets according to Asante (2013); the ethanol market (food grade), the High-Quality Cassava Flour (HQCF) market, the starch market and the chips/pellet market. Each of these products is traded in large quantities in the international and local market and their demands all show potential for growth.

- ***High-Quality Cassava Flour***: According to UNIDO (2016), the demand for cassava flour in Nigeria shows great prospects for growth. Given the government policy on 10% substitution of wheat flour with cassava flour which is aimed at expanding the cassava flour market locally and reducing the import bill on wheat, the demand for cassava flour will continue to grow.
- ***Crude Ethanol:*** The world ethanol market is growing and cassava, unlike maize, wheat and sugarcane are still under-utilized as a feedstock for ethanol (One World group 2014). Nigeria still imports most of its ethanol and has an annual demand of 160 million liters which is expected to rise to 900 million liters once the ethanol policy if completely implemented. There is a huge opportunity for ethanol production from cassava in Nigeria and farmers and processors can benefit from this. Nigeria established an ethanol policy in 2007 known as the E10 policy which required at least 10% ethanol in all motor fuel. 4.4 million tons of cassava is required for Nigeria to produce 550 million tons of ethanol annually (Prakash 2012). Nigeria stands to gain a lot from commercializing cassava production and processing.
- ***Cassava chips and pellets: the*** processing of feeds is the second most important use of cassava globally. According to Prakash (2012), Cassava chips and pellets forms the bulk of the world trade in cassava product, about 70%. the cassava chips and pallets are incorporated into compound feeds for poultry, pork, fish and cattle. There is a worldwide demand for cassava chips and pellets, but the demand is higher in European (Germany, Netherlands, France) and Asian countries and is well above 10 million tons per year. But the supply is very low and barely meets 30% of the total demand as only very few companies produce cassava chips and pellets both in Nigeria and globally. The demand for cassava chips and pellets for animal feed is growing in Nigeria and will increase further as there is a clamor to come up with a policy to include cassava in animal feeds. Also, with the HQCF policy in Nigeria, demand for chips and pellets which is the raw material for cassava flour has intensified. It is a huge opportunity for investors and entrepreneurs to explore according to the Federal Institute of Industrial Research Oshodi (FIIRO 2013). Establishment of ethanol processing plants in Nigeria will also increase the demand for cassava chips and pellets.
- ***Cassava Starch*:** According to UNIDO (2010), the domestic demand for cassava starch in Nigeria is 230,000MT and 95% of that is imported. Demand for cassava starch has increased with the surging growth in the food and non-food usage of cassava globally. Cassava starch serves as the raw material for a wide range of industrial (plywood, alcohol, paper, glue, cardboard) and food products. However, expansion of the starch market is

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severely constrained by the fact that many countries protect their domestic starch market from competition. Compared to other native sources of starches, cassava gives the best quality starch, has the highest volume per unit of the raw material and is also the cheapest to produce therefore will be very competitive in the market if efficiently produced. PIND (2011) opines that the development of a viable local industry for starch in Nigeria will need the policy on imported starch to be revised as this will act as a catalyst for farmers to upgrade in the value chain. Other secondary products cassava products obtained from further processing cassava starch include; dextrin, adhesives and glucose syrup.

All these cassava products face and will continue to face stiff competitions from imported identical product and locally grown or imported substitute products. Cassava flour competes with imported wheat flour, cassava chips/ pellets competes with grain feeds, starch competes with cornstarch and ethanol competes with ethanol from maize and sugarcane. Nigeria, however, has high growth potential for these industrial cassava products and the expansion of these markets will lead to growth in the production and processing of cassava that will substitute imports (PIND 2011). Efforts have been initiated in Nigeria with the aim of making cassava an engine of economic growth since cassava can be processed into many products ranging from ethanol, livestock feed, various food products, and by-products. These can be used to substitute several imported products and positively influence the balance of trade for countries like Nigeria while increasing the income earning potentials of value chain actors at the same time (Nteranya 2015). There is a growing demand for industrially produced cassava products. This has led to the expansion of the cassava markets and thus encourage the increased production of cassava in many producing countries. One of the main products from cassava, the cassava flour has led to the origination of new foodstuffs (cassava cake, cassava bread, donuts, and co) at the rural areas (Djilemo 2007).

Yams comes a close second after cassava as the most significant tropical root crop. Nigeria being the largest producer of yam has a world share of 66.9% in yam production. Nigeria has over the years witnessed increased growth in yam production over the past decades from 26 million tons in 2000 to 37.3 million in 2010 and then slightly over 44 million tons in 2016 (FAOSTAT). The two major food products from yam are the yam flour (Amala) and pounded yam flour popularly known as poundo yam and the demand for them keeps growing.

- ***Instant Pounded Yam Flour (IPYF)*:** The emergence of instant pounded yam flour in the market as a suitable alternative has seen the yam sector growing as more people embraced poundo yam (Olatoye, Akinoso, Lawal, & Babalola 2014). The industrial processing of pounded yam in Nigeria has been on the increase as it is easier and less costly to transport than the fresh tubers (Akoroda et al., 2010). Despite the concern expressed on quality control (Adeleke, 2009; Dossou et al., 2010) and loss of nutrient from processing (Opara, 2003), the sector continues to witness growth because of the high reduction in drudgery and processing time associated with the traditional pounded yam (Akinoso and Olatoye 2013). World Bank (2012) observed that there is an expanding and sustainable IPYF market in Nigeria and estimated the demand for IPYF to be more than 150,000 tons per year while the current supply is less than 25%. The supply gap was estimated to grow at 3.5% per annum as the population grows. There is an opportunity for farmers and processors to move up the value chain into the processing of IPYF.

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- ***Industrial uses***: Apart from serving as food, yam also has a lot of industrial uses just like cassava. Industrial products like all-purpose adhesives are manufactured from yam starch as well just like from cassava starch. Yam flour is used in the production of high-quality biscuits, bread, and cakes in many European countries. The yam chips and pellets also serve the same function as that of cassava chips & pellets in the manufacturing of livestock feeds (PIND 2011).

Nweke, Aidoo & Okoye (2013) projects that gross production of yam in Nigeria will be 10 million tons higher than the total consumption by the year 2025. These projections show that there will be a surplus of 10 million tons that can be exported to other countries. Despite the high costs involved in the production of yam, it remains a highly profitable venture and with the demand for yam growing in both the local and export market, there is a need for farmers and processors to take advantage of the opportunity to expand their production capacity (AngelCapitalMarket.com 2014). According to Beckford, Campbell & Barker (2011), yams have grown to become an important export crop with a considerable earning potential that is hugely untapped. Demand for processed yam products has also witnessed an increase in recent years even though most consumers prefer fresh ware yam (EPAR 2012). According to Foraminifera (2015), the global market for fresh ware yam is estimated to be growing at 3% annually. Nigeria has a comparative advantage in the production of yam and therefore should be competitive in fresh yam exports.

Materials and Methods

The target population for the study were small to medium- scaled farmers and processors in the cassava, yam and plantain value chains of Nigeria. The study was carried out in five southern states of Nigeria which happens to be the five top producing states for these crops in the country according to the Nigerian Bureau of Statistics (NBS 2016) namely; Ondo state, Ogun state, Edo state, Delta state, and Cross Rivers state. The study employed the use of multi-stage sampling and technique in selecting the 600 participants for this study. A structured questionnaire with Likert scale-based items and mostly closed-ended questions was developed and used to gather the primary data for the study. The questionnaires were administered to the respondents using face-to-face survey strategy to ease the primary data collection process. Secondary data was gathered from journals and internet articles. Collected primary data were analyzed using descriptive statistics and presented with the aid of charts.

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FINDINGS AND DISCUSSIONS

Demand prospects for cassava and yam products

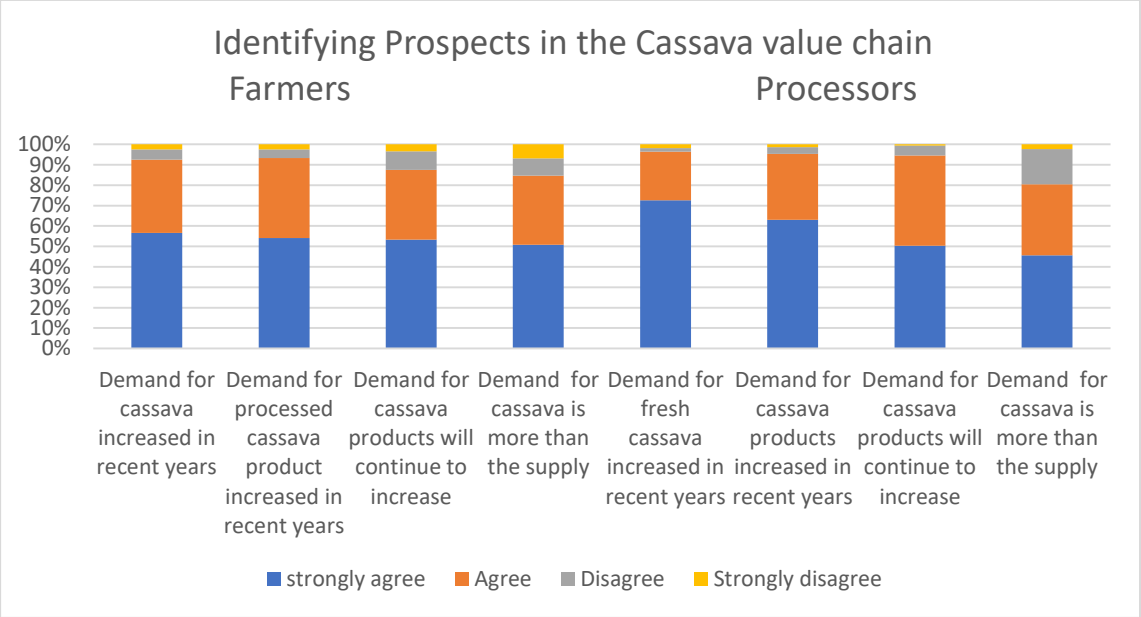

Figure 3: Farmers and processors level of agreement with the demand prospects in the cassava value chain.

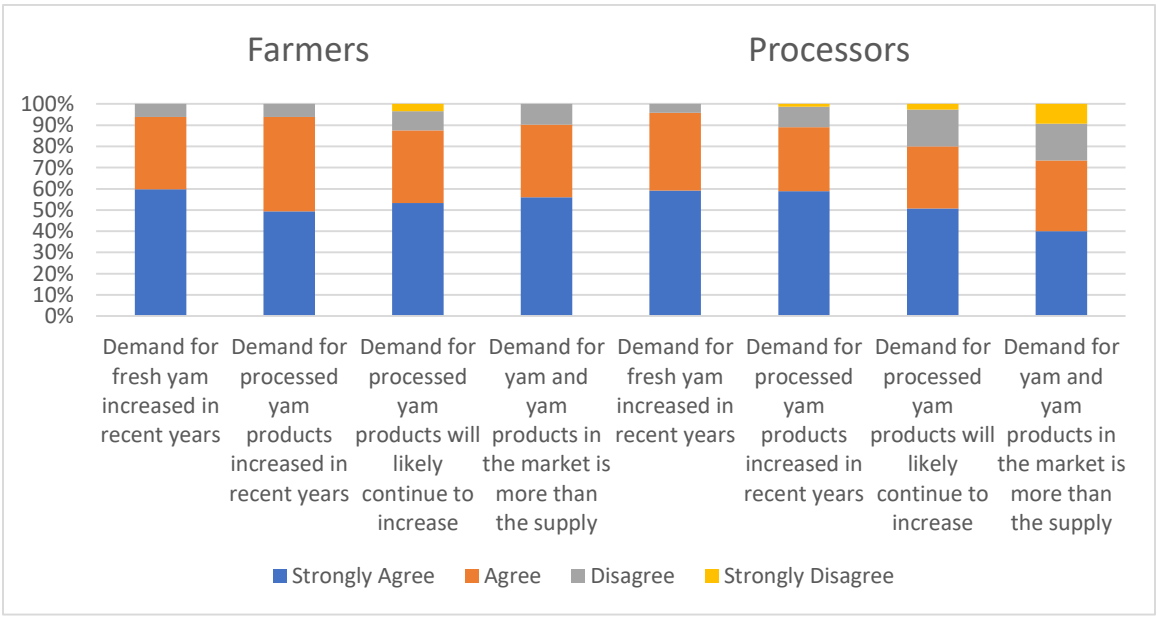

Figure 4: Farmers and processors level of agreement with the demand prospects in the yam value chain.

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Comparing farmers and processors knowledge of food and industrial products and markets with their produce.

This section aimed at finding out how knowledgeable the farmers and processors are on the food and industrial products that can be processed from cassava and yam. This is to show if they are aware of the many prospects in the value chains, they operate in. Respondents were asked questions on the products they produce, their knowledge of other products their commodity can be processed into and their knowledge on emerging markets for these products.

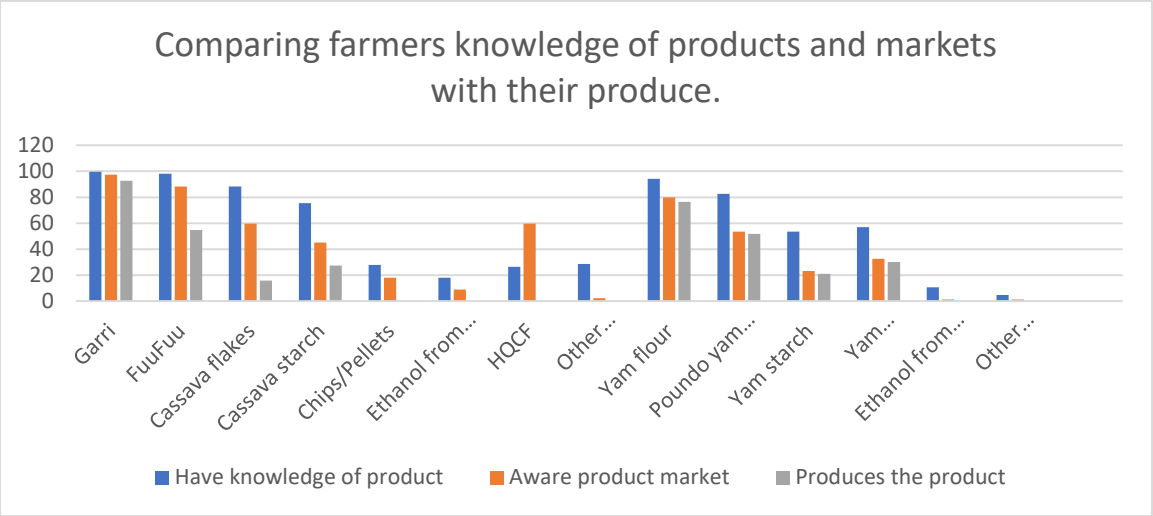

Figure 6: Comparing farmers knowledge of products and markets with their produce.

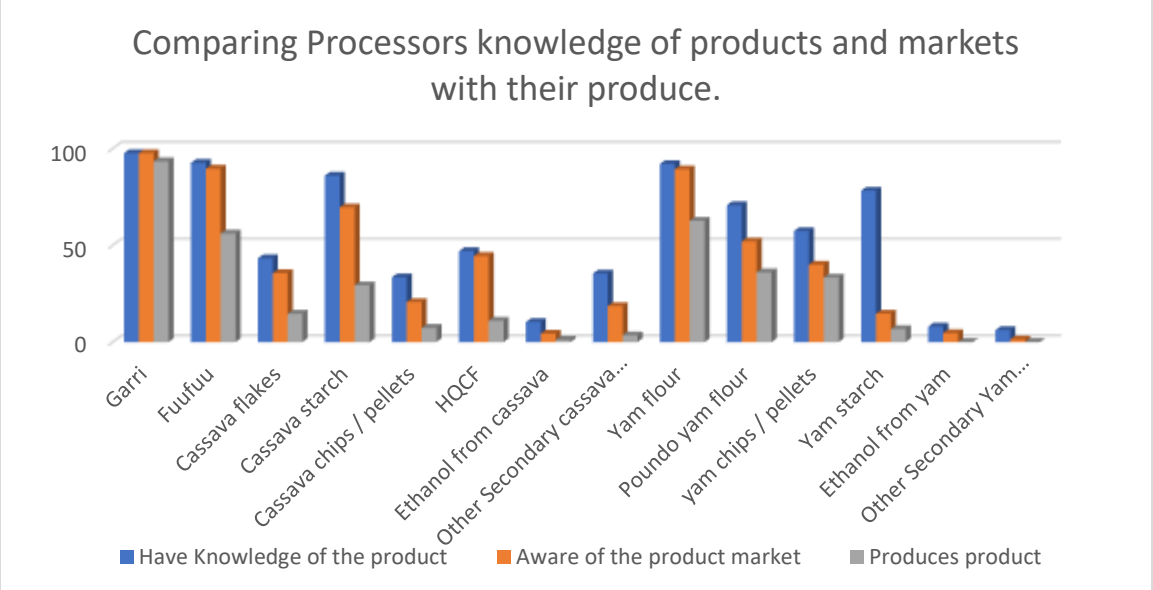

Figure 5: Comparing processors knowledge of products and markets with their produce.

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DISCUSSIONS

Farmers and processors in the value chains under study have a good understanding of the prospects in the value chains they operate in. More than 90% of cassava farmers and processors either strongly agreed or agreed that demand for fresh cassava and processed cassava products have increased in the past few years and will continue to increase. They also agreed that the demand for fresh cassava for food and industrial use is more than the supply. The same pattern is seen with yam farmers and processors with a higher percentage of farmers and processors falling into the strongly agreed and agreed category on demand for yam for food and industrial growing in the last few years and the demand outstripping the supply. These findings imply that they are aware of the prospects in these value chains. If the demand for these commodities or products from them is higher than the supply and the demand is growing, then there is a need for players in the value chain to take advantage of the growth in demand and either expand their production capacity or engage in new functional enterprises to meet these demands.

From the findings, a low percentage of farmers have knowledge of industrial products cassava and yam can be processed into. Less than 30% of the cassava farmers have knowledge of industrial products like cassava chips and pellets, High-Quality Cassava Flour (HQCF), Tapioca, and others (Dextrin, Adhesives, and Glucose). A similar pattern is observed with yam farmers apart from yam chips and pellets with almost 59% of yam farmers stating they have knowledge of it, less than 5% of yam farmers have knowledge of products like Dextrin, Glucose, and adhesives. Less than 20% of cassava farmers and 12% of yam farmers have knowledge of Ethanol. This is in comparison with the knowledge of the food products they can be processed into. Garri has the highest percentage for cassava farmers with 98%, followed by Fuu Fuu with over 88% and starch with 75%. Yam flour has the highest percentage for yam farmers with 90%, followed by poundo yam flour with 82%

In the same manner, a lower percentage of cassava farmers are aware of markets for industrial products than the markets for the food products apart from the market for HQCF with almost 60% of the farmers stating they are aware of the market. This can be attributed to the highly publicized government policy on HQCF of 2013 requiring food manufacturers to use a minimum of 10% cassava flour for their products. Less than 10% of the farmers are aware of the markets for the other industrial products. More than 90% of the farmers are however aware of the markets for the food products. Consequently, none of the farmers are into the processing of cassava industrial products. Majority of them process their cassava into food products majorly for home consumption with Garri having the highest percentage. Cassava is consumed in several forms in the country and has a robust domestic market, so this is not surprising. This finding agrees with PIND (2011) findings that 90% of cassava produced in Nigeria are processed as food while about 10% is used for industrial production and that more than 70% of cassava used for food is processed into garri which is hugely preferred by consumers. Similarly, the yam farmers are more aware of the local/export markets for the food products yam can be processed into than the markets for the industrial products. Only yam chips/ pellets are processed by about 23% of the yam farmers. None of the farmers' process yam into fuel-grade ethanol or other industrial products. An emerging market is the export market for fresh yam and over 40% of the farmers are aware of it but none exports.

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Like that of the farmers, a low percentage of the processors have knowledge of the industrial cassava and yam products compared to their knowledge of the food products. The same pattern is repeated in their knowledge of the markets with HQCF having the highest percentage of cassava processors aware of the market and ethanol having the lowest percentage. Consequently, only a few of the processors process cassava into industrial products. Majority of the processors' process into food products with garri having the highest percentage followed by fuu fuu, starch, and cassava flakes. The responses from the yam processors also follow a similar pattern to that of the cassava processors, with a higher percentage of the processors having knowledge of the market for food products and processing food products rather than industrial products. Similarly, the yam processors are more aware of the local/export markets for the food products yam can be processed into than the markets for the industrial products. The processors mostly process their yam into food products. The only industrial product they process into is the yam chip/pellets used for livestock feed.

Implications for Practice

Promote upstream linkages and knowledge spillover; the presence of market linkages between farmers/processors and industrial users of cassava and yam products is a major step in solving this problem of lack Knowledge. Nigeria has the capacity to meet both the domestic food needs and industrial needs of these products being the biggest producer of yam and cassava in the world. There is a need for the government to come up with a policy that promotes linkages between industrial users of cassava and yam and farmers/ processors. There is also need for an improvement in coordination amongst value chain players to increase the supply of cassava, yam, and plantain from farmers to processors. This will ensure that processors get their raw materials in an efficient and cost-effective manner. It will also assure farmers of markets for their supplies and reduce their dependence on spot markets.

Knowledge and Information Framework: More effort should be put into developing the information and knowledge framework for the sector. Knowledge is power and to increase entrepreneurship levels in this value chains, knowledge and information is an important ingredient that will guide decision making. Findings from this study indicate that farmers and processors generally lacked knowledge of industrial products and markets. Extension services should be focused on creating awareness for farmers and processors on industrial products they can produce. The need for information on products and markets both domestic and export cannot be overemphasized. Raising their awareness of these products and markets alongside equipping them with training on how to process these products with a focus on quality and safety will empower a lot of the farmers and processors to upgrade their functions and go into processing these products.

Build capacity of processors to engage more in secondary processing of industrial products with policies: There is need to build the capacity of processors to engage in secondary processing of industrial products and this can be done through the enactment of policies. Industrial products are big money earners that can impact more on the livelihood of processors than income from food products. The government can come up with similar policies to the 10% HQCF to promote secondary processing of these products. The government can partner with private investors to promote the processing of products such as ethanol, glucose, chips, and pellets for both the

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domestic market and the export market. The government can protect local industries and promote local production of these products with the use of policy tools like import quotas. This will drive local demand which will ripple through the value chain and create an opportunity for people to start producing and processing these products thereby increasing entrepreneurship levels in these value chains.

CONCLUSION

From the study, it can be concluded that there is an overall lack of knowledge of industrial products and markets by farmers and processors in these value chains. Despite the huge prospects that these value chains have to offer, most farmers and processors are not aware of the industrial products, especially those produced through secondary processing; ethanol, glucose, adhesives, and dextrin. Quite a few are aware of the HQCF and this can be attributed to the 10% HQCF policy the government publicized a few years back but still, not many of them process HQCF. Processing is focused more on food products targeted at the domestic market. Findings from the study show that a high percentage of the respondents in this study have knowledge of the food products and the markets for them. This lack of knowledge of industrial product and markets can be attributed to the weak linkages between industrial users and farmers/processors. The little to no linkage between them causes farmers and processors not to take advantage of the inherent entrepreneurial opportunities processing these industrial products present for them while it causes industrial users to be hugely dependent on imports. The situation is a paradox that should be handled as Nigeria being the biggest producer of cassava and yam in the world should not be dependent on imports of industrial products manufactured from these commodities.

Future Research

There is a need to carry out a research to find out what other factors apart from lack of knowledge, contribute to farmers and processors inability to engage in the processing of industrial cassava and yam products and why the high dependency on imports by industrial users when it could be sourced locally at lower cost.

References

Adeleke S.I. 2009. Food poisoning due to yam flour consumption in Kano (Northwest) Nigeria. *Online J Health Allied Scs.* 2009;8(2):10

Akinoso, R. & Olatoye, K. K. 2013. Energy utilization and conservation in instant- pounded yam flour production. International Food Research Journal 20(2): 575-579 (2013) Journal homepage: http://www.ifrj.upm.edu.my.

AngelCapitalMarket.com. https://www.angelcapitalmarket.com/.../istant-pounded-yam-flour-manufacturing-090...

Asante-Pok A., 2013. Analysis of incentives and disincentives for cassava in Nigeria. Technical notes series, MAFAP, FAO, Rome.

Print ISSN: 2058-9093, Online ISSN: 2058-9107

Beckford, C.; Campbell, D.; Barker, D. 2011. Sustainable Food Production Systems and Food Security: Economic and Environmental Imperatives in Yam Cultivation in Trelawny, Jamaica. *Sustainability* 2011, *3*, 541-561.

Djilemo, L. 2007. Cassava flour (Manihot esculenta Crantz) unfermented: The future of cassava cultivation in Africa. In: Cassava International Workshop, Abidjan, Ivory Coast.

Dossou, R.A., Baco, M.N. and Aihou, K. (2010), Diagnosis of production, preservation, processing and yam marketing in Benin: elements of the elaboration of a regional research program on yam. A report commissioned by the International Institute of Tropical Agriculture under a planning grant from the Bill and Melinda Gates Foundation.

FAO, 2014: Food and Agriculture Organization of the United Nations. Crop yield. http://faostat.fao.org/site/567/DesktopDefault.aspx?PageID=567#ancor

FAO. 2016. FAOSTAT database. [Online]. Available at: http://bit.ly/NmQzZf. [Accessed: 10. April 2017].

Federal Institute of Industrial Research, Oshodi (FIIRO). 2013. High-Quality Cassava Flour Production. http://www.fiiro.org/index.php/products/134-bottles. [Accessed: 16 April 2017]

Food and Agriculture Organization of the United Nations Statistics Division (FAOSTAT), 2015

Izekor, O. B., & Olumese, M.I. 2010. Determinants of yam production and profitability in Edo State, Nigeria. African Journal of General Agriculture, 6(4): 205-21.

National Bureau of Statistics (NBS). 2012. LSMS – integrated surveys on agriculture: general household survey panel 2010/11. Available at: www.nigerianstat.gov.ng/pages/download/194. [Accessed: 27. February 2017].

Nteranya Sanginga. 2015. Root and Tuber Crops (Cassava, Yam, Potato and Sweet Potato). IITA background paper.

Nweke F., Aidoo R. & Okoye B.C. 2013. Yam Consumption Pattern in West Africa. Technical Report.DOI:10.13140/RG.2.2.18917.50401}.

Opara L. U. 2003. Yam Post-harvest Operations. Edited by AGST/FAO: Danilo Mejía, Ph.D. INPHO Post-harvest Compendium. Food and Agricultural Organization.

Partnership Initiatives in the Niger Delta (PIND) 2011. A Report on Cassava Value Chain Analysis in the Niger Delta.

Prakash A. 2012. "Cassava: International market profile," Trade and Markets Division, FAO.

UNIDO (United Nations Industrial Development Organization). 2006. Cassava Masterplan: A Strategic Action Plan for the Development of the Nigerian Cassava Industry. Abuja, Nigeria. World Bank. 2013. World Bank Online Statistical Database. Accessed 10/02/2013. http://data.worldbank.org/

Print ISSN: 2058-9093, Online ISSN: 2058-9107

Verter, N. And Bečvářová, V. 2014. Yam production as a pillar of food security in Logo Local Government Area of Benue State, Nigeria. European Scientific Journal, 10(31): 27–42.

World Bank. 2012a. Africa Can Help Feed Africa: Removing Barriers to Regional Trade in Food Staples. Washington, DC.

World Bank 2013.Growing Africa: Unlocking the potential of agribusiness. World Bank. January 2013. Communicated to Reuters in April 2014 by Nigeria's finance minister Okonjo-Iweala.

Print ISSN: 2058-9093, Online ISSN: 2058-9107