SOCIAL CONTEXT OF HUMAN CAPITAL DEVELOPMENT AMONG PRODUCERS OF PALM OIL AND LOCUST BEANS IN OSUN STATE, SOUTH WESTERN NIGERIA

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ABSTRACT
Human capital development is invariably linked to skill acquisition and sustainability of any trade including palm oil and locust beans processing. Palm oil and African locust beans possess widespread food and non-food usefulness. Hence this paper examines the social factors responsible for the continual sustainability of these industries despite the discouraging production milieu. The study used a synthesis of the literature in addition to a qualitative data collected from four focus group discussions involving a total of thirty-six processors and three key informant interviews with palm oil and locust beans producers from selected rural communities (Oloba-ogundarin and Gbogan) in Osun State. The communities were purposively selected due to high involvement in oil palm and locust bean production respectively. The study found that human capital development efforts among palm oil and locust beans producers was through social learning which takes the form of learning-on-the-job and the younger ones participating in the trade alongside their family mentors. The predominant use of local methods and implements in production of palm oil and locust beans. Production of palm oil and locust beans production were highly profitable depending on the scale, season and expertise. Labour was divided across gender lines with women been often involved in processing and trading of palm oil and locust beans, while men served as harvesters. The paper advocates for training by government or NGOs on modern methods as well as the procurement of modern machineries to make their work less cumbersome and eliminate stress.

Key words: Social learning, Human Capital Development, Palm oil, Locust beans,

INTRODUCTION

Human Capital Development (HCD) refers to the process of acquiring knowledge and increasing the number of persons who have the skills, education and experience that are critical for economic growth and development of a country's economy. It is seen as the deliberate and continuous process of acquiring requisite knowledge, skills and experiences that are applied to produce economic value for driving sustainable national development (Harbison, 1973; Okojie, 1995; Eigbiremolen and Anaduaka, 2014). HCD comes in two major forms: formal and informal. The formal takes place in an officially organized setting for passing across knowledge, for example in schools, special training programmes and skill acquisition centres, while the informal type take up the form of social learning, in others words, learning from experienced practitioners within the family or community through active participation and hands on learning. Hence, HCD is invariably linked to skill acquisition and sustainability of any trade including palm oil and locust beans processing.

Palm oil and African locust beans are high economic value products processed from plants. Palm oil is extracted from the ripened mesocarp of the fruits of oil palm tree (Elaeisguineensis). The five leading oil palm producing countries are Indonesia, Malaysia, Thailand, Colombia and Nigeria (Mba, Dumont and Ngadi, 2015). Palm oil is a global agricultural commodity used in a host of food and non-food products. It has overtaken soybean oil as the most important vegetable oil in the world (Teoh, 2010). In the same way, Africanlocust beans (*Parkiabiglobosa)* possess widespread food and non-food usefulness throughout West Africa. The seeds, pods, fruit pulp and leaves are edible and used as cooking or drinking ingredients. The tree is particularly valued for its fermentescible seeds. They are fermented to prepare a condiment that is called "soumbala", "dawadawa", "netetu" or "afinti" "irru". This condiment is used for sauce and soup seasoning, it is

one of the most important commercial products traded in western Africa (USDA, 2017; Heuze,Thiollet, Tran, Edouard and Lebas, 2019).

Oil palm and African locust beansare native to Africa (Ofosu-Budu, and Sarpong, 2013; Orwa, 2009, Sina, *et al,* 2002) the two agro products, palm oil and locust beans have been increasingly important driver for the economies of producing countries as a staple part of the national diet and generating revenue from export. They are central pillar of rural development as major generator of rural employment, income, and drivers of rural markets. However, the processors of these agro products face the challenge of low productivity due to the crude of processing, unfair pricing of the finished products, diminishing labour force as result of rural-urban migration and lack of opportune exposure to modern skill acquisition for processing the products (Teoh, 2010; Olapade-Ogunwole, Olawuyi, and Akinniran, 2011; Farayola; Okpodu, and Oni, 2012, Adisa, Ayanshina and Olatinwo, 2014).

Despite the low or non-existent formal human capital development efforts in modern technology use in the palm oil and locust beans processing industry in rural Nigeria, palm oil and locust beans processors have been able to sustain the production of these agro products through traditional indigenous methods. This sustained production, despite the non-availability of machines and the energy sapping process of production, is embedded in social cohesion and interdependence of the processors of the agro products. While there are a lot of studies of the nutritional and economic benefits of the agro products (Ognatan *et al,*2011; Ifeanyieze, Nwapkadolu and Nwareji, 2016), empirical studies are scare on the social factors responsible for the continual sustainability of these industries despite the discouraging production milieu. To this end, the study aims to examine the social context of HCD among producers of palm oil and locust beans In Osun, South Western Nigeria with particular focus on social learning (of processing skills), gender roles and income.

Research objectives

The main objective of this study is to examine the social context of human capital development among producers of palm oil and locust beans In Osun, South Western Nigeria while the specific objectives are to:

1. Investigate the methods of human capital development for skill acquisition for palm oil and locust beans production in Osun State, Nigeria.
2. Examine the roles men and women play in the production of palm oil and locust beans in Osun State, Nigeria.
3. Highlight the role of income in sustained production of palm oil and locust beans in Osun State, Nigeria

Review of literature

Nigeria produced 910,000 tons of palm oil in 2014 and continue to produce large amount tons of palm oil and locust beans (FAOSTAT, 2017). Unfortunately, most of these produce are consumed locally despite the huge demand for palm oil and locust beans in the international market. Nigerian processors have not been able to meet up with demand due to limitation in implements being used in processing the products (Izah and Ohimain, 2016). It is noteworthy that Malaysia which today stands as the world's largest exporter of palm oil actually got the seedlings from Nigeria when Nigeria was the world's largest producer and exporter of palm oil in the 1960s and 1970s (Rathke, 2015; Adeoye, 2016; Ekanem, 2018). However, Nigeria has been relegated to the back in world export ranking index.

Palm oil is a hugely versatile oil used in variety of ways in different cultures, industries and markets. Besides, palm oil is a highly sought-after commodity in homes, restaurants and food processing industries. As a non-food product, palm oil is useful in the production of soaps, detergents, candles, lubricants, biodiesel among others. Moreover, palm oil derivatives are usually used in pharmaceutical and cosmetic industries. Apart from local trade in palm oil, it is heavily sold in the international market as crude palm oil and usually command high premium price (Iwuoha, 2017). Furthermore, Oil palm and all products emanating from it have provided employment for many and provided an avenue for farmers and processors to participate in the cash economy (Norwana *et al* 2011; Budidarsono *et al,* 2013).

Extant studies have documented that rural palm oil and locust beans processors still use traditional methods and implements in processing although there are now modern ways of carrying out the process (Ojewunmi, 2016; Adeoye, 2016; Ekanem, 2018), processing of the agro products involves division of labour along gender lines (Yusuf and Rahji, 2012) and that the trade is profitable (Olapade-Ogunwole, Olawuyi, and Akinniran, 2011; Farayola, Okpodu, and Oni , 2012;Adisa, Ayanshina, and Olatinwo, 2014; Ifeanyieze, Nwapkadolu, and Nwareji, 2016; Iwuoha, 2017). However, little is known about the human development efforts in acquiring skill in the production of palm oil and locust beans and the social factors influencing the sustainability of these processing sector despite the cumbersomeness of the processing procedure. This are the gaps that this study filled.

Theoretical framework

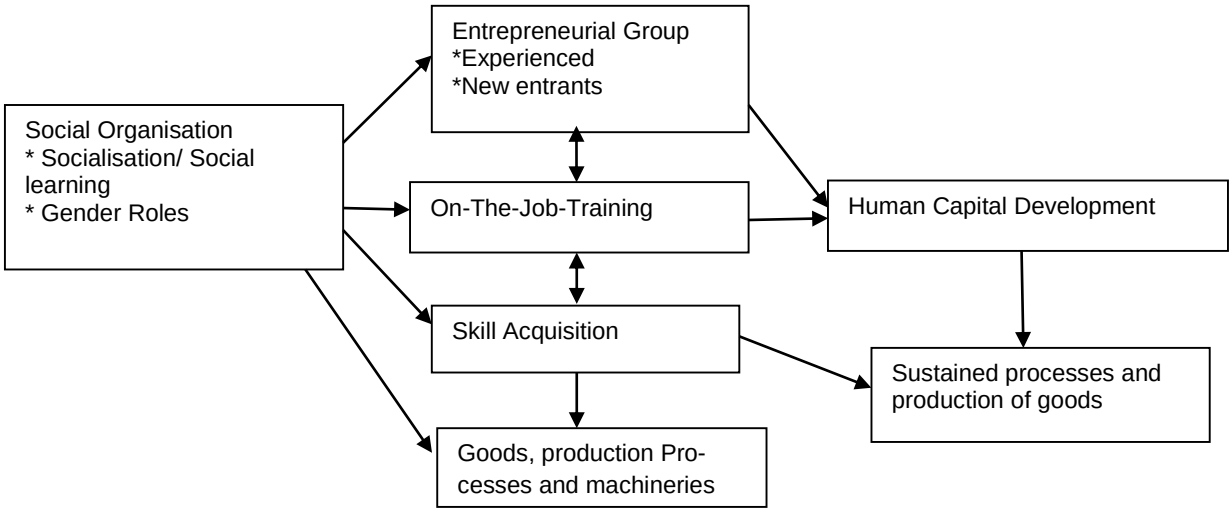
The study is guided by HCD theory by Becker's (1962; 1994). Becker explains that the most important investment in human capital is training. Training does not only happen in formal institutions – like schools. Trainings can also take place outside school in form of informal learning. Basically, human capital development entails investment in aspects of human potentials which can directly contribute to the growth in real income, in particular, and economic well being in general. While formal education is important for acquiring requisite skills, Becker sees on-the-job-training as a key component of human capital development. According to him "many workers increase their productivity by learning new skills and perfecting old ones while on the job". Just as an apprentice learns a completely new skill from his/her master/trainer; an intern joins an organisation, after the completion of a formal education, to further develop the skills he/she has already acquired in school. Hence, the acquisition new skill is germane to productivity and progress.

The fact that learning has to impacted by another who has the requisite knowledge, this brings in a social dimension into human capital development. Acquiring skills for a trade requires social learning and may entail joining an entrepreneurial group in order to be grounded in that field. The "learning-on-the-job" paradigm of Becker is conceptualised as social learning with focus on systemic relations which goes on among entrepreneurial group members and their environment (Jensen, 2005). Prevalent economic resources in a community, societal structures, socialisation processes as well as the associated patterns of social behaviour all impact on the skills an entrepreneurial group learns and pass down (Earle and Earle, 1999) that is, culture drives collective behaviour and what is learnt. This helps to sustain the trade sector as a social and economic unit. Acquisition of skills is driven by learning and acquisition of knowledge from experienced members who have been in the trade for a long time through a form of 'on-the-job training or apprenticeship.

This is applicable to practitioners in the oil palm and locust beans processing industries in rural Osun State, in Nigeria. Although, they lack formal education and government efforts towards improving their human capital is non-existent, older practitioners in the production process see to the continued production of products by passing their knowledge to new entrants in the field and maintaining the social organisational patterns needed to keep the knowledge flow fluid. The oil palm and locust beans industries have sustained productivity, productivity and continuity through informal knowledge transfers and trade solidarity. This is clearly depicted in the conceptual framework (Figure 1).

Conceptual Framework

Figure 1: Conceptual framework of social structure of human capital development in palm oil and locust beans production



Source: Authors concept

METHODOLOGY

Study Design and Population

The study employed a qualitative research design using case studies. Data were also collected from oil palm and locust beans processors from selected rural communities with high production in the study area. The study populations were oil palm and locust beans processors in the selected communities and data were collected using qualitative methods such as focus group discussions processors and key informant interviews with processors and agricultural extension agents in the selected communities.

Study Area

The study was carried out in selected rural areas in Osun State, Nigeria. The state covers a land mass of 9, 251Km^2, it is border by Ogun State to the south, Kwara State to the north, Oyo State

to the west and Ekiti and Ondo State to the east. Osun state is predominantly a rural state, comprising of a few semi-urban cities and many villages. The state is within the tropical rain forest with abundance of resources and suitable climate for the cultivation of tree and food crops. The common tree crops are cocoa, kolanut and oil palm, while the common food crop grown are maize, yam banana and cassava. The state is known for high production of palm oil and locust beans. Palm oil is gotten from abundant oil palm plantations, while locust beans is gotten from Kwara, one of the neighbouring states. The study was conducted in selected rural communities that are predominantly known for palm oil and locust beans processing.

Sampling Procedure

The study population was all palm oil and locust beans processors. Locations used for the study were purposively selected with respect to areas having palm oil and locust beans processing being the predominant economic activities. Iwo and Ayeide local government areas were purposively selected due to their involvement in oil palm and locust bean production respectively. One rural community was selected in each LGA, Oloba-ogundarin and Gbogan was selected in Iwo and Ayeide LGA respectively. A total of four focus group discussions were held, one male and one female FGDs for oil palm and locust beans each. A total of thirty-six participants were involved. Each focus group discussion consisted of a minimum of eight and maximum of twelve participants.

Data collection and reporting

Data were collected using an interview protocol for the Key Informant Interviews (KII) and Focus Group Discussion (FGD). The instruments were backed up with audio-tape recording and notes taken by researchers. Information obtained from focus group discussions and key informants' interviews were later transcribed and analyzed. The notes taken during the FGDs and KIIs were also utilized in analysis. Researchers understand that the results from the focus group discussion and key informant interviews are the opinions of a small sample size which is small for generalization. However, they are very useful for enriching the existing literature on human capital growth in agricultural production.

RESULTS AND DISCUSSIONS

Palm oil and locust beans are necessary additives to food, especially to soup, in African countries. Palm oil, in particular is in high demand globally, hence, the ubiquitous importance of the agro products. The study found out that palm oil and locust beans processing has been going on in Osun State for several decades through the use of traditional processing techniques and in instrument. The findings of this study are further presented under four major sections corresponding with the specific objectives of the study.

Socio- demographic characteristics of the respondents

All the respondents were adults, married and have been in the business for average of fifteen (15) years. The age range of the respondents was between 30 and 71 years, both males and females Majority of the respondents had no formal education, while a minority had School Certificate and an additional technical education.

The methods of human capital development for skill acquisition for palm oil and locust beans production

Every trade requires acquisition of skills in order to be productive, which could be conceptualised in different ways. It could be explained as that knowledge accumulated over time which translates to increased mastery. It could also be conceptualised as the skill demanded by the job which the worker must develop if he/she does not have it already (Nickson, 2017).

Results shows that skill acquisition is embedded in knowledge transfer within the family. Parents or guardians who have been in the trade pass down the knowledge to the younger ones. Learning takes place as younger ones participate in the trade alongside their family mentors. When these ones grow up, they transfer the knowledge to the offspring and younger ones too. Knowledge transfer on how to harvest palm nut and process palm oil are passed down from generation to generation. Respondents emphasized that they learnt the trade as they grew up in the family. Moreover, the traditional labour-intensive way of processing palm oil and locust beans meant that household members are used for labour. Hence, the knowledge is passed to the younger generations through hands-on-learning. It was observed that the rural population have not been exposed to the use of modern technologies in oil palm processing. The key informants and focus group discussants highlighted that:
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> *We grew up to meet and learn the trade. I learnt the palm oil trade from my great grandmother. She used to farm the vast farm land in those days (pointing to the palm tree farmland around*)
> ***IDI/Male/Palm tree grower and Palm oil producer/Osun State/2018***

> *We have experts here amongst us. We already have the requisite skills for this trade…We inherited it from our fore fathers*.
> ***Men/FGD/Palm tree grower and Palm oil producer/Osun State/2018***

> *We inherited the trade from our fathers...It is the traditional way we know and that is what we have been using.*
> ***Women/FGD/ Palm oil producer/Osun State/2018***

A discussant from the locust beans processing group has this to say:

> *I was still a very young girl when I started (laughter). You see, my mum was into the trading of locust beans... It was since that period I have learnt it and I've been doing it. I didn't learn it from outside the home/family. My aunt, the younger sister of my father, whom I lived with, it was there I started my own personal business on locust beans.*
> ***Women/FGD/Locust Beans Processor/Osun State/2018***

It was discovered from the study that the process of making the palm oil and locust beans into finished products is very tedious and takes about three days to complete. Some discussants have this to say:

> When the seeds are harvested, we will dress it, then cook it, afterwards, we will take it to the mill and grind it. Afterward, we'll pour it in a large pit designed for processing and start extract the oil. After extracting the oil, we will put it back on the fire. The shafts will be separated from the oil. The kernel will also be separated. We will boil the oil until it is well cooked. The process could take about three days. When you see us when we are working, we are covered in dirt.

Women/FGD/Palm Oil Processor/Osun State/2018

Individuals used either sand or mortar and pestle to remove the dirt. That's why the finished product usually have stones at times. Another method some people use is rubbing the dirt away with ashes. At times, producers use their legs to marsh and wash off the dirt.

Male/IDI/Locust Beans Processor/Osun State/2018

For instance, the locust beans you met us cooking has been on fire since yesterday. We keep on adding fire wood until it is well cooked.

Women/FGD/Locust Beans Processor/Osun State/2018

From the findings, processors used their hands and legs as well as implements like mortar/pestle and local pits and drums in processing. While the local methods and implements of palm oil production involve little costs to the processors, it is rather cumbersome. Moreover, it does not allow the processors to extract the oil fully from the palm nuts, hence, a high percentage of edible oil is lost in the process. The findings of this study correspond with Ojewunmi (2016); Adeoye (2016); Ekanem (2018).

Figure 3: Traditional way of processing Palm Oil
Note: Picture of lady palm oil processor from Iwuoha, 2017

Gender roles in the production of palm oil and locust beans

For palm oil processing, there is a sort of division of labour along gender lines in the palm oil processing in rural areas. Though men and women grow palm trees and do all the necessary tasks to make the palms grow well in order to have a good harvest, men are usually the harvesters while women are mainly the processors. However, this does not mean that men do not partake in processing the product. Findings from the FGDs supports this:

When our men harvest it from the farm, they bring it home. It is from there our own work start. We will remove the bad ones, grind it, sieve it then cook it, until it becomes edible.
Women/FGD/ Palm oil producers/Osun State/2018

Men are the ones that usually harvest the palm nuts because harvesting is laborious…When we bring the seeds from the farm… the women will help us extract the oil…
Men/FGD/Palm tree grower and Palm oil producer/Osun State/2018

The division of labour on gender lines is because harvesting palm fruit tree is seen as a laborious task for women. Women who do not have a male family member to assist her with harvesting the palm nuts often engage male harvesters to do this for her. Women were often involved in processing and trading of palm oil and locust beans. These findings are in agreement with Yusuf and Rahji (2012) as well as Adejumo, Azeez, Geply, and Oboite; (2013) they found that locust beans processing and trading, in particular, are dominated by female. The reason for this is that the trade is a traditional family art done primarily by rural women.

The role of income in sustained production of palm oil and locust beans

Building human skill through formal or informal human capital development improves the earning capacities of individuals. This is because those skills give those in a field of enterprise avenues of getting income by engaging in that enterprise. Hence, skill acquisition and human capital development improve productive capacities, thereby leading to higher earnings (Son, 2010). Findings from the study revealed that the profitability of the business, despite the stress involved, is one the major factor encouraging the processors to still remain in the sector. In the light of the discussion on the profitability of the enterprise, the key informants and FGD discussants revealed that:

There is ample profit in it but … the income depends on the size of one's farm…the income It is … is quite enough if one has a large plantation…
Women/FGD/ Palm oil producers/Osun State/2018

It is profitable. But when we sell through middle men, we don't make as much profit.
IDI/Male/Palm tree grower and Palm oil producer/Osun State/2018

A discussant said:

It is profitable. The thing is that it is seasonal. During the harvesting times, palm oil use to be cheap…So, you may not make as much profit. At the harvest season, one may sell a 20-liter keg for about N7000. But when you harvest, process and store it away for the off-season periods, like December and January, you'll make more money.
Men/FGD/ Palm oil producers/Osun State/2018

Some other discussants said:

Locust beans business is now very lucrative. Income from the trade is good now compared to time past. Yoruba has an old adage that talked about how unprofitable locust beans business used to be before. The proverbs says " O k'ọjaoniruko to se pepa" (meaning a person that wants to change a naira note into lower denominations will go past a locust bean seller before he/she can

get a person to change the naira note) but the adage is no longer true. Locust beans processors and sellers are making good profits now.
Male/IDI/Locust Beans Processor/Osun State/2018
…the money we make from making and selling it is good … The money helps to meet our basic needs…
Women/FGD/ Locust Beans processors/Osun State/2018

There was a unanimous agreement that the palm oil and locust beans processing business are profitable. These findings corresponding with the findings of Adisa, Ayanshina, and Olatinwo (2014); Ifeanyieze, Nwapkadolu, and Nwareji, (2016); Iwuoha, (2017). The only set back was that when the sell through middle men, a big chunk of their profit is taken away. One of the respondents cited an example that, sometimes middle men buy finished products from them for about N6000 and resell in another community at N12, 000. That is twice the price of the cost. If processors were able to sell directly to end users at that price (N12, 000), then, they will have more profits. Figures 4 and 5 show the value chain and potentials for revenue generation for palm oil and locust beans processing.

Figure 4: Value chain and income generation potentials of palm tree farming and palm oil processing (picture model developed by Authors)
(Note: Pictures 1,2 and 5 from Google search; Pictures 3 and 4 from Punch Nigeria Online)

Figure 5: Unprocessed and processed locust beans sold in the market at Gbogan Osun State
(Source: Field work)

Conclusion and recommendations

The study concludes that practitioners in the palm oil and locust beans business sector acquire their skills for the trade through social learning which takes the form of learning-on-the-job. This is their own major form of human capital development. These communities have not had the benefits of being trained in the modern way of processing these two agro products. Local methods and implements are still being used to process and produce palm oil and locust bens in these communities. Although this method involves little cost in processing (since it involves little or no modern machineries), it is quite cumbersome and stressful. For the palm oil processors, in particular, they do not get all the contents of edible palm oil out of the palm nuts as a result of using the traditional method. A considerable amount is still left in the shafts which are being disposed of as waste or used for other purposes. However, in the long run, the trade is profitable to the practitioners. Furthermore, work processes involved in palm oil and locust beans processing are divided on gender lines. However, this division is not based women inequality to men but rather to facilitate the speed of work while allowing men to do the more labourious aspect of harvesting.

It is recommended that government agencies and Non-Governmental Orgnisations (NGOs) should train practitioners on the use of modern methods of processing in order to make their work less cumbersome. Furthermore, using machineries will also allow the processors to get full oil extracts from the palm nuts and increase their financial earnings locally and internationally.

REFERENCES

Adejumo, A. A., Azeez, I.O., Geply, J.J. & Oboite; F.O. (2013). Processing, utilization and challenges of African locust bean (P*arkiaBiglobosa, Jacque Benth*) In Arigidi Akoko, Ondo State, Nigeria. *Journal of Agriculture and Social Research*, 13(1), 39-49.

Adeoye, G. (2016). Working like elephants, eating like ants: Sad tales of Nigeria's poor female palm oil processors (1). Punch Nigeria Online. Accessed on 14/2/2019.

Adisa, R. S., Ayanshina, S. O & Olatinwo, K. B. (2014). Economic analysis and constraints of traditional processing of African locust bean in Kwara State, Nigeria. *Kasetsart Journal of Social Science* 35(1), 124 –133.

Becker, G. S. (1962). Investment in human capital: A theoretical analysis. **http://www.nber.org/chapters/c13571** accessed on 23/4/2019.

Becker, G. S. (1994). Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education (3rd Edition). Accessed from http://www.nber.org/books/beck94-1 on 2/11/2018.

Earle, L and Earle, T. (1999) Social context theory. *South Pacific Journal of Psychology*, 11(2), 1-12.

Eigbiremolen, G. O & Anaduaka, U. S. (2014). Human Capital Development and Economic Growth: The Nigeria Experience. *International Journal of Academic Research in Business and Social Sciences*, 4 (1), 25-35

Ekanem, I. (2018). Palm oil production In Nigeria: Leveraging Global Value Chains. Accessed from http://uipalm.com.ng/palm-oil-production-in-nigeria/ on 14/2/2019.

FAOSTAT (2017). FAO Crops Statistics Database. Available at: http:// faostat3.fao.org/browse/Q/QC/E (accessed 12 April 2017)

Farayola, C. O., Okpodu, V. & Oni, O. O. (2012). Economic Analysis of Locust Beans Processing and Marketing in Ilorin, Kwara State, Nigeria. *International Journal of Agricultural Resources Innovation and Technology*. 2 (2), 36-43.

Harbison, F. H. (1973). Human Resources as the Wealth of Nations. New York: Oxford University Press.

Heuze, V., Thiollet, H., Tran G., Edouard, N.& Lebas, F. (2019). *African locust bean (Parkiabiglobosa&Parkiafilicoidea)*. Feedipedia, a programme by INRA, CIRAD, AFZ and FAO. https://www.feedipedia.org/node/268

Ifeanyieze, F.O; Nwapkadolu, G. & Nwareji, F. (2016). Business benefit concerns of women processors of African locust bean seeds for poverty reduction in Enugu State-Nigeria. *Global Journal of Agricultural Research*, 4 (4), 47-56.

Iwuoha, J. (2017). Red Palm Oil – How to make money from this lucrative but overlooked business. Accessed http://www.smallstarter.com/browse-ideas/red-palm-oil-production-in-africa-2/ **on 14/2/2019.**

Izah S. C. & Ohimain, E. I. (2016). The opportunities and weakness of Nigerian oil palm industry. *Biotechnology research*, 2(1), 33-43

Jensen, P. E. (2005). A Contextual Theory of learning and the learning organization. *Knowledge and Process Management,* 12 (1), 53–64.

Mba, O. Dumont, M & Ngadi, M, (2015), "Influence of palm oil, canola oil and blends on characteristics of fried plantain crisps", *British Food Journal*, 117(6),1793-1807.

Nickson, D. (2017). Skill requirements in retail work: the case of high-end fashion retailing. Work, employment and society, 31(4), 692– 708.

Ofosu-Budu, K., & Sarpong, D. (2013), Oil palm industry growth in Africa: A value chain and small holders study for Ghana, In: Rebuilding West Africa's Food Potential, A. Elbehri (ed.), FAO/IFAD.

Ognatan, K ; Adi, K ; Lamboni, C; Damorou, J.M ; Aklikokou, KA; Gbeassor, M *et al* (2011). Effect of Dietary Intake of Fermented Seeds of *Parkiabiglobosa*(Jacq) Benth (African Locust Bean) on Hypertension in Bogou and Goumou-kope Areas of Togo. *Tropical Journal of Pharmaceutical Research*, 10 (5), 603-609.

Ojewunmi, M. O. (2016). Optimizing the conditions and processes for the production of protein nutrient from *ParkiaBiglobosa s*eeds. PhD Thesis submitted at Department of Chemical Engineering, College of Engineering, Covenant University, Ota.

Okojie, C.E.E. (1995). Human Capital Formation for Productivity Growth in Nigeria. Nigerian Economic and Financial Review, June, 44-55.

Olapade-Ogunwole, F; Olawuyi, S. O. & Akinniran, T. N. (2011). Economic analysis of locust bean processing and marketing in Iwo local government, Osun state. *International Journal of Applied Agricultural and Apicultural Research* 7 (1& 2): 54-63.

Orwa, C., Mutua, A., Kindt, R., Jamnadass, R. & Anthony, S. (2009). Agroforestree Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, Kenya

Rathke, S. (2015). The problem with palm oil: The next wave of supply chain class Actions?https://www.globalsupplychainlawblog.com/consumer-products/the-problem-with-palm-oil-or-the-next-wave-of-supply-chain-class-actions/ Accessed on 14/2/2019

Sina, S.; Traoré, S. A., (2002). *Parkiabiglobosa* (Jacq.) R.Br. ex G.Don.. In: Oyen, L.P.A.; Lemmens, R.H.M.J. (eds), PROTA (Plant Resources of Tropical Africa/Ressourcesvégétales de l'Afriquetropicale), Wageningen, Netherlands

Son, H. H. (2010) Human Capital Development Asian Development Bank Economics Working Paper Series No. 225

Teoh, C. H. (2010). Key sustainability issues in the palm oil sector. A discussion paper for multi-stakeholders consultations (commissioned by the World Bank Group).

United States Department of Agriculture (2017). GRIN - Germplasm Resources Information Network. National Germplasm Resources Laboratory, Beltsville, Maryland. Accessed from **https://npgsweb.ars-grin.gov**

Yusuf, O. I.S & Rahji, M. A. Y. (2012). The Processing and Preference for Locust Beans Products (Parka Biglobosa) In Lagos. *Journal of Biology, Agriculture and Healthcare*, 2(11),105-112

Zusman, M; Knox, D & Gardner, T. (2009). The Social Context View of Sociology Carolina Academic Press Durham, North Carolina,