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Agro-based Industrial Linkages: Evidences from the Cotton and Textile Industry in the Agrarian Funtua Region of Katsina State, Nigeria.

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Abstract
The study examined at local level the role of cotton and textile industrial linkage in employment opportunities in the cotton value added chain in Funtua region of Katsina State. An interview and direct observation method of data collection methods were typically undertaken to learn about the cotton and industrial processes and how they give rise to their respective products and by-products. Seven (7) agro-based industries were identified and visited in their various locations in the study area were purposively selected. The study investigated the forward and backward linkages processes that the five (5) active cotton and textile industry agreed to. Results indicated that few cotton and textile industry had folded up but majority of them are operating at low capacity most especially Funtua textile Limited that is currently hit with high cost of production, poor raw material supply, erratic power supply and lack of government support. The study identified the existence of weakness in backward linkage of agriculture in the developing economy of the study area. Finally, the conclusion offers suggestions that the weakness in the backward linkage can be alleviated when local farmers are empowered, by introducing them into mechanized system of farming, providing them with farm inputs and market opportunities. This would amount to making the study area an economic 'growth pole' for the northwest geo-political zone.

Keywords: Agro-based industry, Funtua region, cotton, textile industry, linkages, northwest

INTRODUCTION
The role of agricultural sector in industrialization process of any country has been well established in development economic literature (Waniko, 2016). An agricultural sector contributes to economic development in four different ways; it supplies the labour force, the raw materials, the savings and food needed to establish and maintain industrial production (da Silva et al., 2009). This input in form of raw materials that the agricultural sector contributes and outputs of material in relation to non-agricultural sectors is what forward and backward linkages explained (Richardson *et al.,* 2017). The concept is widely used in industrial and economic geography to portray inter-firm interdependence. A firm's linkages can be divided into: backward linkage, which provides goods and services for its production activities; and forward linkage, which refers to links with customers purchasing its products (Adan *et al.,* 2020).

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Furthermore, the industrial sector in return is expected to provide more efficient agricultural inputs and improved socio-economic infrastructure that can enhance agricultural productivity. Hence, the relationship between both sectors is seen as jointly reinforcing (Todaro and Smith, 2011). This mutual relationship between agricultural and industrial sectors is what becomes obvious in Nigerian cotton and textile industry because of chain-value that it provides. For example, between 1975 and 1985, the Nigerian textile industry had grown to become the third largest in Africa after Egypt and South Africa (Tolagbe and Burnip, 1987). Okeke (2000) according to Diogu *et al.* (2014) observed that by 1996, the number of textile mills in Nigeria was estimated at 134, half of which were significantly large and made up of integrated spinning, weaving, bleaching, dyeing, printing, and finishing mill. When the textile allied factories are added to this estimated number, the number of textile industry established in Nigeria was estimated at over 250. Okeke (2000) further noted that the growth and stability of Nigerian textile industry encouraged the establishment of chemical industry for provision of synthetic fibers, bleaching salts and dye stuff. In all these, integrated textile mills and allied industry provided jobs for thousands of Nigerian peoples, as most Nigerians were trained as weavers, spinners, dyers and designers (Odey *et. al.,* 2018).

Moreover, the textile industry in particular has ceased to be an important contributor to foreign exchange earnings and employment generation in Nigeria due to inadequate power supply, inconsistent government policies, rampant smuggling of foreign textiles and insecurity (Owen *et. al.,* 2016). Nigeria has become a mono-economic country that depends on oil for most of its earnings since 1968 and this has remained so making oil money the major source of foreign exchange earning accounting for almost 80% (Sule and Inedu, 2018).

One of the ways to mitigate this problem of (mono-economy syndrome) sole reliance on oil amongst other bleak features, by which the Nigeria's economy is characterized, is to empower the country's agro-based firms, particularly the cotton and textile industry. This is because of Nigeria's potentiality of harnessing the human and material resources that is endowed with as well as cotton and textile industry capability of generating cluster of related and dependent industries, which create linkages phenomenal attributes. This is quite feasible because it is done in other developing countries like Nigeria. For example, Raihan and Khondker, (2010) reported that the performance of the export-oriented textile and clothing sector has been one of the most notable success stories in South Asia, as countries like Bangladesh, India and Pakistan. The importance of the sector to the region is also reflected from the share of the sector in total exports of all its major economies. Raihan and Khondker, (2010) further reported that in 2007, textiles constituted around 80 per cent of total exports of Bangladesh, 55 per cent of Pakistan and around 12 per cent of India. The textile sector is of great importance in South Asia in terms of direct and indirect employment generation, women employment and empowerment, contribution to export earnings and economic growth (Raihan and Khondker, 2010).

Due to favourable geographical location of Funtua region, it gives her an upper economic and social advantage over all other places in Katsina State (Tukur, 2009). Funtua is blessed with all required factors capable of spurring agricultural production: beneficial climate; good clay-loam soil; and able workforce. According to Adamu (1987), the highlighted factors attracted the British Colonial Administrators to settle in Funtua thereby making the region an agricultural hub where cash crops such as seed cotton and Soy-beans were grown, processed and marketed. Economic activities in Funtua region, due to her endowed physical and human

factors were at its peak during the periods of Colonial Administrators (Tukur, 2009), when the British established the British Cotton Growers' Association (BCGA) through which farmers were encouraged to produce cotton by supplying them with American type of cotton seed called 'Allen long staple crop' *Gossypium hirstutum L.* (Adamu, 1987 and Ammani, 2014). The seed cotton production and processing for both domestic and international trade was encouraged by the construction of railway that reached Funtua town from Zaria in the year 1928. This was to serve as a means for the evacuation of cash crops from the northwest of Nigeria to Apapa Port at Lagos for shipment to Europe (Onyemelukwe and Filani, 1983).
The purpose of this study was to examine at local level, the role of cotton and textile industrial linkages in the creation of employment opportunities in the cotton value added chain. The specific objectives were to: i) identify the cotton and textiles processing industries in Funtua; ii) examine in practice the economic geographic concept of agro-based industrial linkages; and iii) suggest a plan of action for the potentiality of Funtua in becoming a 'growth pole' for northwest geo-political zone. The research question for the study was; does agriculture acquire the strong linkages necessary to drive agro-based processing industries in the agrarian Funtua region of Katsina State?

MATERIALS AND METHODS

Study Area

Funtua is a town in the southern part of Katsina state of Nigeria. It is located at approximately 11°32′N and 07°19′E coordinates.

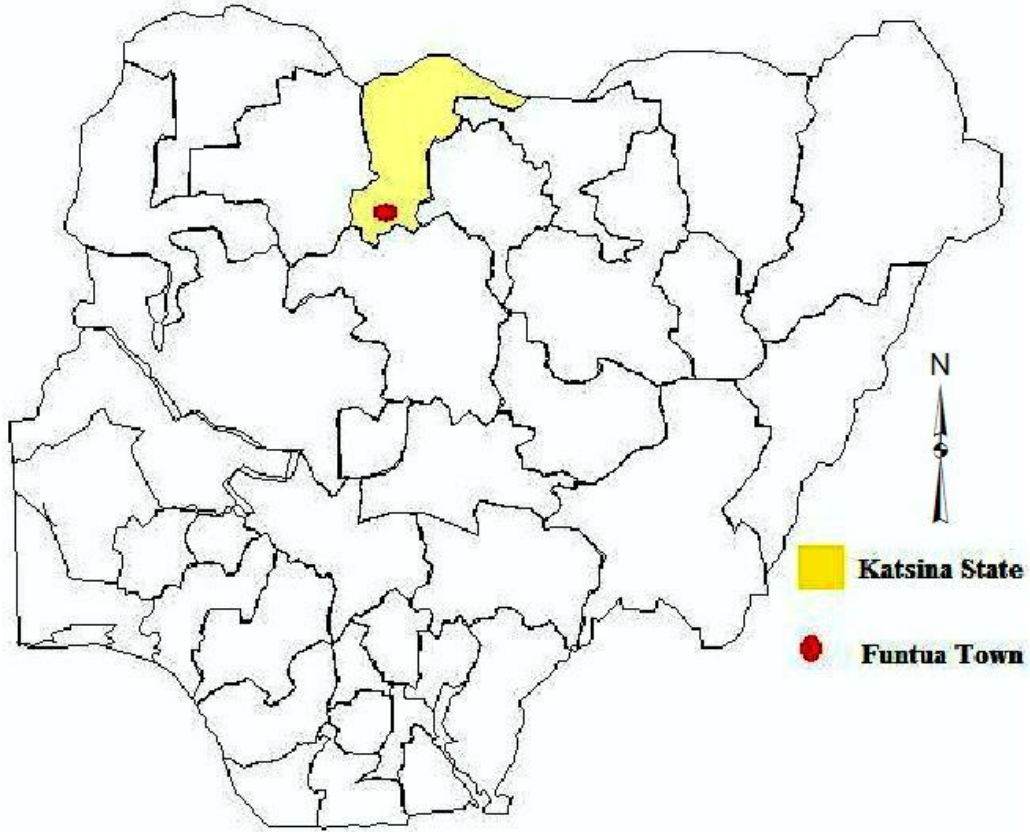

Figure 1: Map of Nigeria showing the location of the study area in Katsina State Created in *ArcGIS®*, 2022

It covers an area of approximately 448km² and it is the farthest Local government area from Katsina state capital city about 215 km south of Katsina town. Due to favourable physical factors of vegetal, hydro-geologic, edaphic and climatic conditions that favour agricultural

productivity and industrial activity, Funtua is made worthier of studying in Katsina state. It is located within Sudan savanna vegetation belt. The soil is rich black loam giving high yield in agriculture. The mean annual rainfall received in Funtua is far greater than any other place in Katsina state, where about 900mm annual rainfall is received (Candotti, 2009 and Adefila, 2014).

Data Collection and Evaluation

Seven (7) agro-based industries of varying magnitude have been identified and visited in their various locations in the study area. But, focused was on five (5) active industries, two (2) data sources were considered. Interviews and direct observation method of data collection were typically undertaken to learn and gather information about the cotton and textile industrial activities and how it gives rise to their respective products and by-products. The observation was direct in the sense that we (the observers) remained physically present and personally monitored what was taking place thereat. This method of data collection was particularly useful for understanding how and why something occurs within a natural setting (Chou and Lu, 2022). The data collection was conducted overtly, in the sense that the presence of us (the observers) was known to the subjects (the participants) that perform the industrial activities (Chou and Lu, 2022). The activities of processing, packaging, transporting and marketing were observed.

Being qualitative study, purposive sampling method was employed because we were dealing with small population of interest Osuala (2005) and our study required in depth and detailed information from a particular subset of our population of interest (Ciesielska and Jemielniak, 2018). Sampling criteria for the study included two (2) levels: organizational and individual. At organizational level, personnel managers in each of the industries were interviewed about the managerial work of their respective industries. At individual level, with the help of their personnel managers, five (5) workers in each industry were selected (on the condition of the length of period they spend in the industries) and interviewed, and the industrial activities were monitored and noted down (Merriam, 1998).

The data collection procedure was ethically approved to respect the privacy and psychological well being of the individuals whose activities were being studied, we sought after the consent of the workers (the participants) through personnel managers of the individual industries under study.

The study was based on descriptive analysis, whereby the information so collected were described and summarized.

RESULTS AND DISCUSSION

West African Cotton Company (WACOT) Limited, Funtua Textile Limited, Alhaji Babangida Jargaba (ABJ) Ginnery and Oil Mills Limited, Sun-Agro Industries Limited, Cotton and Agricultural Processors Company (CAP) Limited, LUMUS Cotton processors Limited and Northern Dairies Limited. However, CAP Limited, LUMUS Processors Limited and Northern Dairies Limited have not been in operation for quite some times. However, WACOT Limited ABJ Limited, Funtua Textile Limited and Sun-Agro Industry Limited are all in operation. Even though, their operation has not been to full capacity for evident reasons such as financing, marketing strategies, man power development, dependency on foreign technology, infrastructural inadequacy, insecurity, smuggling of textile goods, inadequacy of locally produced raw materials (Odey et al., 2018).

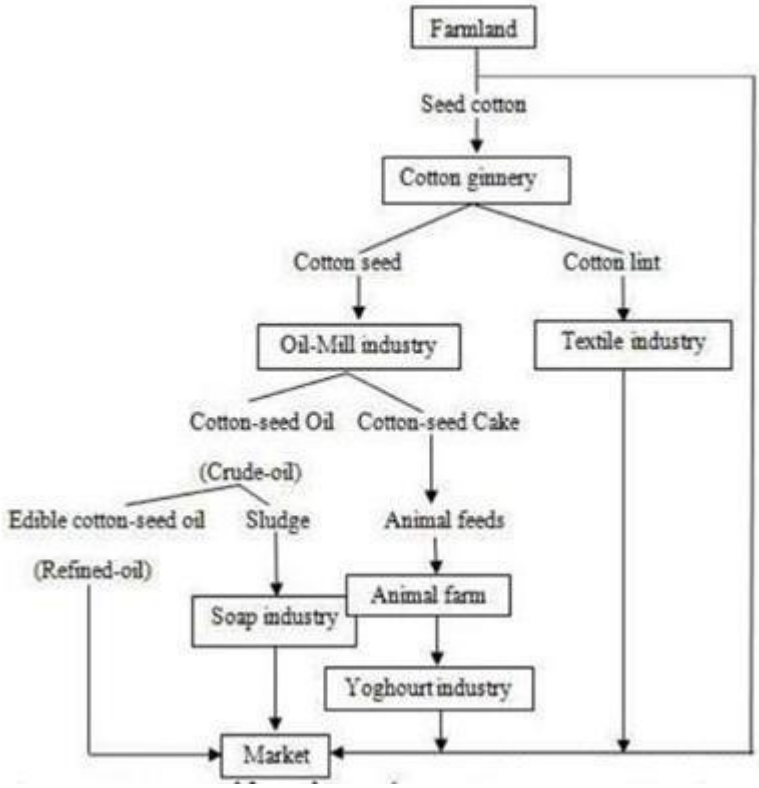

Figure 2: Forward and backward linkages in cotton and textile industry
Source: Fieldwork, 2021

Furthermore, WACOT and Sun-Agro Industry Limited were international group of companies that deal with buying and processing agricultural produce particularly cotton. They as well provide support for farming communities through empowerment programmes for women and the youth. For this reason, Funtua oil mills Limited, Funtua textiles Limited, WACOT Limited and Sun-Agro Industry Limited were found to depend heavily on cotton and cotton seed for most of their (raw materials) from particularly the farming communities in the Funtua Senatorial District, Bakori, Danja, Dandume, Faskari, Sabuwa, Malumfashi, Kafur, and Dutsin-Ma local government areas (Katsina State Investor's Handbook, 2016).

Adeniji (2007) reported that cotton (*Gossypium hirsutum L.)* being important cash crop in Nigeria that produces lint and seed serves as raw material for the local textiles and seed crushing industries. Cotton seed provides edible oil for consumption while cotton seed cake is used as raw materials for livestock feeds due to high protein content. It can be seen that the backward and forward linkages for all the seven agro-based firms emanated from the seed cotton obtained from the farms (Figure 2). The seed cotton from the farm serves as raw material (backward linkage) for ginnery industry; this is where the seed will be separated from the fibre (the lint).The lint is the principal raw material (backward linkage) for the textile industry, where a fine thread of a natural material will be spun into yarn and a cloth will be woven from it by heavy duty machines. This is the product of the textile industry (forward linkage), which is taken directly to the market for sale.

But, for the cotton seed separated from the fibre, is a by-product of ginnery industry. The cotton seed becomes the raw material (backward linkage) for oil mill industry, where cotton seed (the crude) oil will be extracted from it (forward linkage) as well as its residue (the cotton

seed cake). The crude oil was subjected to further processing for refinement. Hence, an edible cotton seed oil was produced (forward linkage), which can be taken straight to the market for sale. Furthermore, the cotton seed (crude) from which the edible oil was extracted, there left a residue (the sludge), which is taken to soap industry as its raw material (backward linkage). The soap manufactured is subsequently taken to the market for sale.

From the oil mill industry, after the cotton seed crude oil is produced, cotton seed cake, which is the main raw material (backward linkage) for making animal feeds (forward linkage) is taken to animal farm (forward linkage) from which beef and mutton are produced (forward linkage). Besides, milk from the animal farm, milk is taken to yoghourt industry (backward linkage), from where fermented milk will be manufactured (forward linkage). At last, the milk product will be taken to the market for sale (Figure 2).

Besides, Okeke (2000) according to Diogu (2014) reported that the growth and stability of Nigerian textile industry encouraged the establishment of chemical industry for provision of synthetic fibres, bleaching salts and dye stuff. These authors reported further that these integrated mills and allied industry provided jobs for thousands of Nigerian peoples, as most Nigerians were trained as weavers, spinners, dyers, and designers. The overall effects of these changes in raw materials at different levels of processing are the multiplier effects (da Silva *et al.,* 2009). In all, the cotton industries of Funtua region have the potential to provide employment for the rural population not only in farming, but also in off-farm activities such as managing, packaging, processing, transporting and marketing the cotton-based products. Based on our findings generally, at every stage of value added, employment and income opportunities will be generated for the working population (da Silva *et al.,* 2009).

However, Hirchman (1958); Fei and Ranis (1961) according to Vogel (1994) are of the opinion that agriculture is seen only as a source of an abundant labour supply and a transferable surplus. The scholars reiterated further that agriculture serves as the support to the engine of growth that its role in the transformation of a developing economy was seen as subordinate to the central strategy of accelerating the pace of industrialization. Agriculture was singled out by Hirschman (1958) in particular, for its failure to exhibit strong forward and backward inter-industry linkages needed for development. The author reported further that agriculture lacks direct stimulus to the setting up of new activities through linkage effects. The weak backward linkages of agriculture failed to induce capital formation thereby derailing agriculture as the leading sector in the growth and developmental processes.

In contrasting view, Waniko, (2016) observed that, for a successful development strategy, technological advancement must support both industrialization and improvements in agricultural productivity. The author further submitted that the revolution in agricultural productivity releases human resources to industry. This revolution in agricultural productivity is indispensable base of modern economic growth as this is especially characterized in the developing economy of the sub-Saharan Africa like Nigeria (Waniko, 2016). The author reported further that there is direct link between performance of agricultural sector and industry. Therefore, the relationship between agricultural and other sector is symbiotic. This symbiotic relationship is what backward and forward linkages are all about.

As reported by Kuznet (1968) according to Vogel (1994), the case of agricultural productivity for cotton and textile industry was witnessed in this current study because in all the cotton

and textile industry studied, the creation of multiplier effect where seed cotton was supplied to ginnery industry, cotton seed was supplied to oil mill industry, lint was supplied to textile industry, crude oil sludge was supplied to detergent industry and so on. It was equally observed that there was inadequate local supply of such raw materials like cotton seed in the study area. This inadequate supply of raw materials according to Adeniji (2007), it may not be far-fetched from the constraints that about 80% of the local farmers are encountering, which include lack of fertilizer, frequency of spray, market opportunities and inadequate knowledge of the production packages. Furthermore, Ogunlela (2004) reported that the total production of cotton remained far below the requirements of the textiles and the oil mills. The author ascribed this to low average yield of the crop on farmers' plot of about 400-500 kg seed cotton per hectare which is below the genetic yield potential (2.5-3.0) tons seed cotton/ha.

Additionally, the report of Ogunlela (2004) was supported by the Department for International Development [DFID] (2005) final report, that in Nigeria, the linkages between agriculture and industry are weak and this distracts from the contribution of both sectors to pro-poor growth. The supply of agricultural inputs such as fertilizer, improved seeds variety, agro-chemicals, farm tools and processing equipment by industry, needed to increase agricultural productivity, is low in relation to effective demand (Jelilov and Bahago, 2017). In addition, for the industrial sector, it does not provide a significant outlet for agriculture's output and hence fails to help stabilize agricultural markets and plays only a marginal role in opening up attractive new uses for crops (Jelilov and Bahago, 2017).

CONCLUSION

In the study, seven (7) agro-based industries were identified, all of which are in operation, except LUMUS Processors Limited and Northern Dairies Limited that have not been in operation for quite some times. The main reason that made Funtua to allow for the existence of these agro-based industries is her endowment in beneficial climate, good clay-loam soils, able workforce and her strategic location with rail line and road networks linking up various major towns in the northwest zone and beyond.

There found evidences of agro-based industrial backward and forward linkages going on among these industries, with seed cotton being the most abundant cash crop produced from farmlands in the region. The establishment of cotton and textile industry in Funtua becomes a breakthrough for proliferation of more allied industries that process seed cotton. Employment and income opportunities in the seed cotton value added chain is quite obvious in Funtua as the seed cotton became the essential raw material for ginnery industries. The cotton seed separated from lint becomes a backward linkage for edible oil mill industry, while the lint becomes the backward linkage for Funtua textile Limited. The forward linkage of the textile is ultimately a production of fabric that is sold within the country and abroad. The process continued to spur the operations of detergent and yoghourt industries within the study area.

The study is rather sensitive about the weak backward linkage in agriculture in developing economy in the study area that failed to adequately stimulate capital formation. However, the backward linkage weakness can be mitigated through empowering local farmers. By introducing them into mechanize agriculture; providing them with farm inputs (such as fertilizer, improved seeds variety, agro-chemicals) needed to increase agricultural productivity and market opportunities. Thereby generating centrifugal and centripetal forces,

as a result, it forms a set of economic linkages between the 'growth pole' with the surrounding areas.

Owing to the findings recorded in this study, the following recommendations if holistically implemented by the government, Funtua region will become an economic 'growth pole' for the northwest geo-political zone.

1. Nigeria should provide means that will provide farmers access to the use of machinery, inputs and technology to provide sufficient raw material (Cotton) for the cotton and textile industry and for export;
2. The government should provide farmers and agro-allied industries with social and economic overheads like good power supply, good water supply, affordable transportation services and storage facilities to facilitate production, preserve commodities produced and make local industries competitive;
3. Nigeria should adopt the export-led growth model and prioritize or intensify efforts towards agricultural exports;
4. Nigerians should be encouraged to patronize our local products. It appears in the mind of many Nigerians that the locally made textile goods are inferior to the foreign ones;
5. Government should urgently intervene in order to ease problems posed by traditional land tenure systems that makes land acquisition for agricultural purpose difficult;
6. The high costs of production that tend to make commercial agriculture uninviting and unprofitable should be brought down via provision of subsidies for some inputs such as farm machinery, equipment, fertilizer and so on;
7. Incentives such as tax breaks should be given to corporate bodies and firms that are willing to go into large-scale agriculture to source raw materials required in their agro-based industries. Backward integration should be strongly encouraged by all tiers of government such that the federal government is to provide reduction of tax incentives; state governments are to assist in land acquisition at reasonable cost, and the local governments are to mobilize the people to create a good pool of labour force to be employed in various stages of the production process; and
8. There should be creation and promotion of adequate market *vis-à-vis* the increased production to be brought about by industries or agricultural products. This can be achieved through establishment of Export Promotion Council in order to facilitate the exportation of both agro-based industries' products and agricultural products. There should be establishment of cottage industries that can utilize the farm produce as their raw materials.

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