

Innovations in the Indigenous Textile Weaving Firms in Southwestern Nigeria

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Abstract

The study investigated technology innovations and factors influencing its upgrading in the indigenous textile weaving firms in southwestern Nigeria. Data for the survey was sourced from 300 small scale firms with 91% retrieval rate. The survey instruments which were questionnaire, interview and personal observation elicited information on the weaving process. Majority (89%) of the respondents reported product innovations while 8% and 3% have carried out process and organizational innovations respectively. The males (74%) weave on the horizontal loom while female respondents (26%) weave on the vertical loom. Most (96%) of the firms used the manual production process while a few (4%) have introduced some process improvements. Also, 58% of the respondents lack technical skills, technical education (87%) and investment funds (59%). The study concluded that lack of technical education and skills as well as adequate capital could limit the capability of respondents to adopt modern weaving techniques and innovate.

Keywords: Indigenous knowledge, Indigenous textile weaving, Small scale industry, Technology innovations

1. Introduction

The promotion of micro and small enterprises (MSEs) has become a popular development tool around the world. Accordingly, the Federal Government of Nigeria (FGN) has shown increasing interest in promoting entrepreneurship and innovation in indigenous MSEs especially in the textile sector. This has been achieved by the various support programmes to improve their competitiveness through enhancing technology and innovation capabilities such as upgrading product quality, improving design and packaging, and training to improve their competitiveness (Pyke, 1994). The notion is that innovation is essential for MSEs to become and remain competitive, move to higher return activities, and to grow and graduate to medium and large enterprises, thus, creating new employment opportunities (Ernst, 2004).

Recognizing the significance of the MSEs' sector, the FGN enunciated the National Economic Empowerment and Development Strategy (NEEDS) in 2003 and the Vision 20:2020 in 2007 to accelerate their development

and growth. Similarly, the revised Industrial Policy of Nigeria in 2008 also singled out the MSEs' sector as major instruments to create a productive and vibrant private sector and reduce poverty among urban dwellers. These policy documents emphasised the provision of finance, training, infrastructure and upgrading of production technology among other intervention.

However, in spite of their potential to improve economic growth, MSEs impacts in Nigeria are not so obvious. They employ lower levels of techniques while their innovative activities are limited. This is largely due to the harsh environment where they operate (Adegbite, 2010). According to Ernst (2004), unreliable enforcement of contracts, excessive regulatory and administrative requirements, limited access to finance, and inadequate infrastructure services all impose disproportionately high transaction costs on MSEs for doing business generally and for innovative activity in particular. Improving competitiveness is even more crucial in the context of trade liberalization and increasing integration into the world market. Lack of adaptation and upgrading of production technology poses serious challenges, while firms that keep up or even initiate their own original improvements can be expected to perform well (Romijn 2002).

This paper is structured as follows. The next section reviewed existing works on the subject; the types of indigenous *Aso-oke* clothes among the Yoruba of southwestern Nigeria and the process of making *Aso-oke* fabrics. Section three presents the results and discussion of research findings while Section four provides the conclusion and policy recommendations.

2. Theoretical Framework

Technology innovation is one of the critical factors that influence firms' competitiveness in the current globalized economy whereby the traditional barriers to trade and investments are being dismantled. Government policies intended to improve national competitiveness through the performance of the industrial sector depend largely on the sector's perceived or measured characteristics, such as innovation capability (Oyelaran-Oyeyinka, 1996). Therefore, firms in developing countries like Nigeria should develop the capability to exploit the traditional available technology as a means of gaining competitive edge. This capability, otherwise referred to as innovative capability, is embedded in the set of skills and competences as well as the knowledge, resources, creativity and attitude needed to continuously generate and translate ideas into marketable new products, processes and services (Oyelaran-Oyeyinka, 1996).

Innovation in this context is all about change. Change in what is being done and the way it is being done. The first dimension has to do with what a firm makes available to the market. A change could be made in what products or services the firm offers or the way these products or services are created (Tidd *et al.*, 1998). These are traditionally referred to as product and process innovations (Kahn and Manopichetwattana, 1989). The second dimension has to do with the degree of novelty of the innovation (Tidd *et al.*, 1998). Novelty in this context means that the innovation could be fundamentally new to the environment; it could be incremental i.e. small additions/modifications or similar to other innovations in the industry (Oyelaran-Oyeyinka, 1996). However, the focus of the study is on incremental innovations and its impact on the resilience of the indigenous textile weaving industry in southwestern Nigeria. The study would contribute to the literature on technology innovation and indigenous knowledge in the indigenous textile weaving sector especially in southwestern Nigeria.

3. Indigenous Yoruba "*Aso-oke*" Textile

"Aso-oke" is a short form of *"Aso Ilu Oke"* also known as *"Aso-ofi"* meaning clothes from the country highland area. The literal meaning of *Aso-oke* is "Top Cloth". *Aso-oke* is an important item of clothing worn by the Yoruba of southwestern Nigeria. Indigenous *Aso-oke* textile is one of the most vibrant and successful textiles in the African continent. By the end of 20th century, *Aso-oke* was worn by the Yoruba only at major life-circle events such as birth of a new baby, weddings, festivals, burial ceremonies and so on. At present, the fabric is more popular among both the Yoruba and other ethnic groups in Nigeria (Oloyede, 2006). The Yoruba people in southwestern Nigeria especially in major towns such as Oyo, Iseyin, Saki, Okeho, Ibadan, Lagos, Osogbo, Ijebu Ode, Abeokuta, Owo and Ado Ekiti are known for their *Aso-oke* weaving. However, the market for indigenous textiles has decreased with the introduction of European printed cloth ever since the mid-20th Century. Even though traditional hand-woven clothes are sometimes overlooked in favour of the cheaper cloth, it is still considered an important and valuable form of both clothing and art. It is possible that because there are cheaper and more convenient clothes available in the market, these textiles are considered even more valuable and special to the culture (Eicher 1976).

Clothing among the Yoruba is important in several different ways. Cloth is used to signify wealth and status, particularly those of high quality. The Yoruba people often times will cover themselves in beautiful, colourful garments that drape and fold over the body, giving the impression of a person of high stature. Both the quality of the cloth and the amount of cloth used in creating the garment determine its worth. Hand-woven garments are very valuable in the Yoruba culture. The production of *Aso-oke* textiles is a costly and time consuming

procedure yet this process is part of what makes them important to this culture (Cordwell, 1983).

4. Production of Aso-oke Textile Clothes

4.1 Raw Materials

The primary raw materials for the production of Aso-oke textile clothes are cotton, dyes, local silk and bark which are used in making the threads for weaving. They are either locally sourced or imported from Tunisia, Italy, France, Japan and other Asian countries. The cotton is kept in the barn for spinning which is the process of separating the cotton seed from the wool. Locally spun and dyed indigo cotton thread is expensive and often replaced by shining metallic Lurex and brightly coloured rayon threads. This process is also known as sorting (Ajala, 2010). Patterning is another stage which helps in putting the patterns and designs on the Aso-oke. The rolled cottons are neatly inserted into the sticker through the extenders. Aso-oke strips are usually between about 14-15cm and stitched together to make the desired clothes.

4.2 Production Loom

The operators make use of two types of looms for the production of Aso-oke. These are the upright single heddle loom also known as the broad loom used by women and the horizontal double heddle loom mostly used by men. The broad loom is a fixed vertical frame upon which the warp of the thread is held under tension to weave cloth of predetermined length of about 30-90cm width to allow two or three pieces to be stitched together to make a wrap known as “*Iro*” for women. The fabric produced on the broad loom is known as “*Kijipa*”. The double heddle loom used by men is a horizontal loom with unwoven warp yarns stretched out several metres in front of the weaver with heavy stone or heavy metal to maintain tension. The loom produces stripes of woven fabrics, which is about 14-15cm wide. The fabrics are cut and the edges stitched together to make a larger piece of cloth which could be used for clothing or coverings.

4.3 Weaving Accessories

The men’s horizontal loom uses more accessories and provides opportunity for the use of a variety of warp threads which often determines the types and designs of found in Aso-oke.

These accessories include *Akata* (propeller); *Iye* (long wheel); *Gowu* and *Kokogun* (rollers); *Aasa* (stricker); *Omu* (extenders); *Sarin* (metallic pegs); *Odada* and *Itese* (pedals); *Ikeke* (extender rollers); *Okeke* (wheel or axle); *Okuku* (strain holder); *Sofi* (perforator); *Sugudu* (propeller hangar); *Oko* (shuttle) which is canoe shape; and *Agborin* (staff). During patterning, the canoe reels are hinged upon the hangers on a set of metallic pegs on the ground. The reason for this is to roll the cotton into bundles. Thereafter, the actual weaving starts.

4.4 Weaving Process

The rolled cotton will be neatly inserted to the stricker through the extenders. The weaver will tie “*Iro*” (filler) onto his seat. There are two or more holes on the staff in which a small peg is tagged. On the upper hand of the “*Omu*” (extenders), there is “*Okeke*” (wheel or axle) for pulling the “*Omu*” up and down. There are two-step pedals under the extenders (*Omu*) which the weaver presses down alternately during weaving. The pedals when pressed enable the cotton to open and the “*Reeler*” put through to one side while the stricker knocks the reel to and fro to another side. The stricker allows the reel to be finely set alternately (Ajala, 2010). The weaver handles the “*Oko*” (shuttle) throws it inside the open cotton to be received by his other hand, movement of the motor continues and faster as if the weaver is not touching it at all. The reel inside the motor will start giving a peculiar sound: *sakala-si-sakala-sa*. As the weaver continues this way, the cloth is weaved and gradually extends forward. The weaver uses the drawer to pull the cloth towards him and the carrier responds to the force and moves towards him while the weaver continues (Ajala, 2010).

5. Types of Aso-oke Clothes

There are different types of Aso-oke clothes. These include prestigious and ceremonial clothes such as *Etu*, *Alaari* and *Sanyan* as well as other basic and ritual clothes.

5.1 Etu Cloth

Etu (fowl) cloth is blue with white stripes. The strips are woven using local wild silk fibers. Thus, *Etu* is dyed repeatedly in traditional indigo blue dye, which is brought out at intervals for dyeing and stretching. In ancient times, *Etu* was used as important social dress by chiefs and elders among the Yoruba.

5.2 Alaari Cloth

Alaari cloth is crimson in colour. It is traditionally woven with locally spun silk yarns dyed in red camwood solution to achieve permanence in color fastness. The use of *Alaari* is not limited to a particular ceremony but traditionally used for all events among the Yoruba people.

5.3 Sanyan Cloth

Sanyan is regarded as an expensive Yoruba hand-woven fabric, creamy in colour with a white stripe running through the middle of the cloth. It is traditionally produced from fibers made from the cocoons of the Anaphe silk fibers. They are hand-spun into threads, washed and soaked in corn-starch to strengthen the yarn for fabric production. This was however in ancient times. In addition, *Sanyan* is regarded as the most expensive of all the Yoruba woven fabrics. Thus, the Yoruba refers to it as “*Baba Aso*”, that is father of fabrics.

5.4 Basic Clothes

Basic clothes are those produced for everyday use. They are made with traditional hand spun thread or with industrial threads mostly imported from Asian countries to produce lighter cloth that are used as cover clothes, casual wrappers worn to markets, baby ties, work and play clothes among others. Clothes under this category include: *Kijipa* or *Ikale*, *Oja* and *Ala* (Aremu, 1982). *Kijipa* is one of the most common cloths woven by women on the broadloom. It serves a number of social as well as religious functions in the society. Women use it mainly as wrapper to be worn to various places ranging from the market to religious or festive occasions. Aremu (1982) lists a number of functions of hand woven textiles among Yoruba women. According to him, *Kijipa* could perform a number of functions including prevention of miscarriages or cure for barrenness. *Ifa* priests usually prescribe the cloth for childless women or women who experience constant miscarriages. *Kijipa* is also believed to attract to the wearer blessings, protection, prosperity, victory and health. *Kijipa* is also part of the cloth forms, which makes up the costume of the Yoruba Egungun Masquerade.

However, it is not the plain woven *Kijipa* cloth that cures or empowers but the magical charms that have been infused in it that empower the cloth and its wearer. Anyone who goes to the priest for spiritual assistance is usually told to bring *Kijipa* woven in a prescribed way for the ritual exercise. *Oja* is another basic cloth form woven by Yoruba women. It is similar to the *Itagbe* mainly because of the tufts of thread, which are left on it as a decorative method when it is woven. Women use the cloth to secure their babies on their backs. *Ala* or *Ogbo* is a white cloth that is generally used as a cover cloth against the cold and mosquitoes. It also serves as a wrapper for elderly men. It is wrapped under the armpit and thrown over the shoulder. *Ologba Meta*, another basic cloth form is used for making *buba* (shirt) and trousers for men. It is also used to make hunter's outfit. Later with the introduction of formal education, the cloth form was used to make uniforms for children (Adegbite, 2010).

6. Research Methods

The data source of this study is a survey conducted in 2010 on 300 small scale weaving indigenous weaving enterprises in southwestern Nigeria with 10 and fewer workers. The survey instruments include questionnaire and unstructured focus group discussions. They were complemented with interview of some respondents' as well as personal observation of the weaving process. The study was carried out in eleven selected major towns of southwestern Nigeria: Oyo, Iseyin, Saki, Okeho, Ibadan, Lagos, Osogbo, Ijebu Ode, Abeokuta, Owo and Ado Ekiti. A total sample of 300 questionnaires was administered out of which 273 (91%) were retrieved and found useful for analysis. The data were analysed by using descriptive statistics.

7. Results and Discussions

Table I shows that out of the 273 questionnaires that were retrieved and analysed, majority (38%) of the respondents were from Oyo State, 19% from Ekiti State and 15% from Ogun State. The other respondents, 10% and 8%, were from Ondo and Lagos States respectively. Most (12%) of the respondents in Oyo State were found in Iseyin; Oyo town (10%); Ibadan (8%); Saki (5%) while Okeho reported 3%. In a similar study, Olaoye (2005) also observed that Iseyin and Oyo towns are important towns for men's weaving in Yorubaland. Since the early 19th century, they have been prominent centres of hand woven clothes in Nigeria.

The result also confirmed that Ibadan has a thriving market at “*Oja Oje*” (Oje Market) where weavers from various towns in the study area (Annexure 1) sell their woven Aso-oke clothes on a particular day of the week. Lloyd (1993) had earlier reported that Ibadan was noted for the sale and distribution of Aso-oke where customers from all parts of Nigeria, West Africa, and Nigerians in diaspora and even Europeans buy the clothes in commercial quantity for personal and ceremonial use. It was further observed that the “*Oja Oje*” market in Ibadan provide the network and linkage of indigenous weavers to the formal sector of the economy.

Table 1 further showed that 19% of the response came from Ado-Ekiti compared with Osogbo, Owo, and Ijebu-Ode which had 10% response rate each, while the least response of 6% and 8% came from Mushin in Lagos State and Abeokuta in Ogun State. The high percentage of respondents found in Ado-Ekiti and Owo were attributed by Picton and Mack (1979), Olaoye (2005) and Asakitipi (2007) to the resurgence of weaving in the towns in recent years by women who have embraced indigenous textile weaving due to the downturn in the Nigerian economy. Another major reason for the resurgence could be the presence of a textile weaving centre established by government at Ado-Ekiti where prospective weavers could acquire the knowledge and skills. The

outcome of this study validated these findings.

8. Socio-economic Characteristics of Respondents

The social and economic characteristics of respondents such as gender, marital status, age and ownership structure are discussed in this section.

8.1 Gender of Respondents

Table II indicates that 74% of the respondents using the horizontal loom were male while only 26% using the vertical loom were female. The response supports the findings in the literature by Picton and Mack (1979) of indigenous textile weaving in southwestern Nigeria and Maegher (2007) in Ilorin, Nigeria that male entrepreneurs using the horizontal loom are more predominant in the Aso-oke weaving industry while female entrepreneurs who weave on the vertical loom were very few. In addition, the study further showed that while male respondents who weave on the horizontal loom were found in all the towns in the study area, female respondents who weave only on the vertical loom are more predominant in towns such as Ijebu-Ode, Ogun State; Owo, Ondo State; and Ado-Ekiti in Ekiti State. In summary, the few (26%) of women weavers in the industry also confirmed the findings in the literature by Kristiansen *et.al*, (2003) that female entrepreneurs were generally less likely to be founders of manufacturing industries than male while Kourilsky (1980) research also showed that males have higher entrepreneurial intention than females.

8.2 Marital Status of Respondents

Table II presents the marital status of respondents. It shows that most (79%) were married; 18% were single; 2% were widowed and 1% was divorced. The result which indicated that most of the respondents were married agrees with the findings by Hisrich (1988) of micro enterprises in India; the study of small scale entrepreneurs in the Netherlands by Reynolds (1999); and that of small scale industries in Nigeria by Adegbite *et.al*, (2006) which established that married men and women performed well in managing a business because of the social, financial and psychological support than single, divorced or widowed individuals. Married people tend to work harder because of family responsibility and social commitments. This could be a reason why most of the respondents in the study were married.

8.3 Age of Weavers

In Table II, the age distribution shows that most (83%) of the respondents were between the age of 21 to 50 years whereas 13% were 51 years and above while only 4% were between the age of 10 to 20 years. The result is similar to the outcome of a research in India by Sinha (1996); in Britain by Reynolds (2000) and in Indonesia by Kristiansen (2003) where it was disclosed that individuals between 25-44 years of age were the most entrepreneurial active segment of the population and that successful entrepreneurs were relatively younger in age. The high concentration of entrepreneurs in the 25-44 years age bracket in the industry could mean that the younger generations are favourably disposed to establishing and managing indigenous weaving business which could be attributed to high rate of unemployment and underemployment in Nigeria and the lack of opportunities in other sectors of the economy. These factors may perhaps be some of the reasons for the resilience of the indigenous textile industry in spite of the near collapse of the textile firms in the formal sector of the Nigerian economy.

8.4 Ownership Structure of Business

The ownership structure of the firms is presented in Table II. Majority (67%) of the firms were owned by individuals while 15% were family owned. Only 9% were owned by cooperative society; 7% were partnership and only 2% were limited liability companies. In previous studies carried out by Aluko *et.al*. (1972) on micro and small scale enterprises in Nigeria; Chuta and Wilcox (1985) in Burkina Faso; Soetan (1995) in Nigeria; Omisakin (1999) in Ibadan, Nigeria and Adegbite *et.al* (2006) in Nigeria, they also reported that on the average, about 70% of MSEs in these studies were sole proprietorship. The researchers argued that the predominance of this form of business ownership among the MSEs especially in Nigeria is due partly to the advantages of sole proprietorship such as the low investment cost and ease of entry into the business. The process and cost of formalising a business such as a limited liability company has forced many MSEs in developing countries to operate as sole proprietorship rather than limited liability companies. For instance, in Nigeria, the cost of incorporating Limited Liability Company is very high while the process is also cumbersome (Adegbite *et.al*, 2006).

Similarly, Adegbite (2010) further suggested that operating as sole proprietorship may limit the firm's access to capital and other resources necessary for expansion and growth. Besides, another implication of the predominance of sole proprietorship form of business is that ownership, control and management of the enterprises were vested in one person i.e. the entrepreneur who is the sole owner of the business. This means that technology innovation decisions in most of the firms were taken by one person. Hence, the decision to be

innovative or less innovative lies with the single individual. A sole proprietor can take quick innovation decisions, employ motivated people, and have unique or scarce competencies (Noteboom, 1994). However they could also lack the competence, knowledge and skills necessary for process, product and organisational innovations.

Furthermore, the small proportion of partnership, (7%) and Cooperative businesses (9%) could also be due to mutual distrust among the proprietors at the level of business formation and management. Similarly, the result which showed that only 15% of respondents were family owned businesses is contrary to the findings of Bray (1968) research of weavers in Southwestern Nigeria; Lloyd (1993) study of three Yoruba weaving towns and Meagher (2007) of Aso-oke weavers in Ilorin, Nigeria that close to 30% of the enterprises were organised along the lineage, family owned and religion-based organisation of production. This study, however, showed that the traditional family control of the Aso-oke weaving industry in southwestern Nigeria could be on the decline.

9. Production Loom, Methods and Raw Materials

In Table III, the response to the type of production loom used by the respondents indicates that majority (86%) used the horizontal loom while only 14% used the vertical loom. Okeke (2005) also reported that horizontal and vertical looms are the most common in West Africa and Nigeria. Horizontal loom are narrow strip, double-heddle thread looms which are used by men while the rectangular and relatively broad, single-heddle, upright looms are generally used by women. Picton and Mack, 1979 and Maegher, 2007 study also showed that male weavers predominantly use the horizontal loom while female weavers use the vertical loom.

The production methods adopted by the respondents are presented in Table 4. Majority (96%) of the enterprises use the manual production process while only 4% have introduced some minor improvement in their production. The production process is mostly manual and there is very little evidence of any effort to fully automate the weaving process. The problem is also compounded by the length of the horizontal loom which is spread at a distance of about 10-20 metres outside the production shed. The length of the loom makes weaving difficult during the rainy season. However, it was observed that in spite of the predominance of the manual system of production, new innovations on the loom types have been introduced. Some of these include minor adaptations on the horizontal and broad looms. For instance, through casual observation of the weaving process and interview of respondents, we noted that the traditional horizontal loom has been improved upon. Instead of the raffia palm, the loom is now made with wood of different shapes and sizes by local carpenters.

Also, due to the influence of some Yoruba Aso-oke traders who sell the clothes across the Nigerian border with countries such as Togo, Ghana and Cote D'voire, the traditional horizontal loom in areas such as Lagos, Abeokuta, Ibadan and Ijebu-Ode have added on to them extra heddles and peddles. This has increased the width of the horizontal loom from the traditional 5-6 inches to between 7-8 inches in these locations. Similarly, instead of the traditional hand spun thread, the use of electric appliances such as electric motor and winding machine was also observed in some locations where they were used to wind local and imported weaving yarn of various colours on cones prior to weaving. Taken together, these incremental innovations has reduced wastage of raw materials, substantially increased output and sales revenue for Aso-oke products.

In Table 4 the sources of raw materials is presented. Most (69%) of the respondents used a combination of local and imported raw materials; 28% use only locally sourced materials while 3% made use of only imported raw materials. The result, including interview and observation of the weaving process, further revealed that the use of imported yarn of various colours, mostly from the Asian countries, is now common in the industry. This practice has made the clothes more colourful, stronger and durable than the traditional forms of Aso-oke. The respondents claimed that imported yarn of high quality help to reduce idle time and loss of materials during the weaving process. The reason adduced for this is that with the use of the traditional hand-spun cotton yarn, the frequency of breakage was very high. Another major advantage is that the owner of the Aso-oke can wash the cloth without the fear that the colours will run out thereby leaving the cloth faded or that the cloth will disintegrate because of the weak hand spun yarns. This is also a major incremental product innovation in the industry.

10. Types of Innovations

In Table 4, 89% of the respondents carried out product innovations while only 8% and 3% respectively engaged in process and organisation innovations. This result is similar to the findings of Akerele (2000) who reported that among the small-scale metal fabricators in southwestern Nigeria, product innovations averaged 70% while process innovations were 30%. In another study of small and medium scale manufacturing industries in southwestern Nigeria, Abereijo (2006) also reported that 70.2% of respondents engaged in product innovations while only 29.8% carried out process innovations. Product innovations create new products, while process innovations reduce the cost of producing existing products or in the production of new products (Luecke and Katz, 2003). A process innovation also refers to any new equipment, process or improved process that is

introduced in the industry in the past three years. Similarly, organisational innovation refers to new approaches to managing or organising the firm (Davila, et.al. 2006). In this study, the result indicated a very low level of process and organisational innovations. This means that not much has been achieved in process design which may be due to the ownership structure dominated by sole proprietors who lack the technical knowledge, skills and competence necessary for process innovations. Similarly, the low level of education and capital base of enterprises in the sector could also negate their ability to engage in research and development (R&D) activities which could be due to lack of skills and resource crunch (Oyelaran-Oyeyinka, 1996).

10.1 Type of Product Innovations

Table 5 presents the type of product innovations in the industry. It revealed that 76% had carried out new product formulation; 62% reported product modification and 59% were engaged in the improvement of products quality. The number of respondents who modified their products to reduce costs and change the design of product packaging was 26% and 4% respectively. The implication of this result is that there exists a high level of minor change capabilities by the firms. Moreover, the respondents have also demonstrated the ability to improve and adapt their products to satisfy the market needs. With these little process design and minor organisational adjustment, the industry has been able to achieve a high level of incremental upgrading of product design and this is evident in the modern and colourful Aso-oke products sold in the market. In Table 6, respondents were asked to describe their innovations. About 41% and 44% claimed that their product and process innovations respectively were incremental in nature; 37% and 21% reported that they are similar to others in the industry; while 11% and 16% respectively claimed that their innovations is fundamentally new to the world. Other respondents, 7% and 3% reported that they differ from others in the industry while 4% and 16% shows that they are similar to others in the industry.

10.2 How Innovations are Acquired

As shown in Table 7, most (92%) of the new innovations were through personal observation and intuition while only (8%) are associated with intensive scientific research or R&D efforts. Therefore, these innovations were by intuition and not associated with any research and development (R&D) efforts. From our discussions and observations, most of the respondents had no idea of what formal R&D is all about. According to them, virtually all the firm's knowledge base is not codified in blueprints and manuals nor could they show any evidence of the amount of resources spent on R&D. Technical information assist firms to learn more about production technologies and helps on-the-job training and diffusion of knowledge within the firm and maintenance of quality control (Akerle 2000). This is not the case with the firms in the study.

It therefore implies that learning and the resultant skill acquired are effected through direct instructions and built over time through practice. This approach makes transfer of knowledge for process innovations very difficult. Therefore, doing process improvement becomes problematic and could be one of the factors limiting the firms' ability to engage in sustained process improvement and compete with other textile producers in the regional and international market. Similarly, lack of investment funds could also inhibit the ability of the firms to acquire new production equipments necessary for innovations and enhanced output.

10.3 Reason(s) for not Introducing New Process Improvement

Table 8 shows the reasons why majority of the respondents did not introduce process improvement in their operations in spite of substantial product innovations. About 58% of the respondents reported lack of technical skills which means that lack of technical education has limited their exposure to modern weaving techniques. It also has a negative influence on their ability to introduce new process innovations. This is a reflection of lack of formal education among the respondents as only 13% of them possessed technical education. Lack of investment funds was a challenge to 19% of the respondents while 11%, 5%, 3% and 3% signified lack of serious competition; stifling government regulations; lack of investment opportunities; and inadequate investment incentives as challenges respectively.

Process improvement in the industry was also by intuition and not associated with any R&D efforts. Many of the respondents had no idea of what formal R&D is all about. This could be one of the factors limiting the firm's ability to engage in sustained process innovation and compete with other producers of textile clothes in the regional and international market. Lack of investment funds could also inhibit the ability of the firm to acquire new production equipments.

11. Conclusion and Recommendations

In this study, the result indicated a very low level of process and organisational innovations. This means that not much has been achieved in process design which may be due to the ownership structure which is dominated by sole proprietors who lack the technical knowledge, skills and competence necessary for process innovations. Similarly, the low level of education and capital base of enterprises in the sector could also negate their ability to

engage in research and development (R&D) activities which could be due to lack of skills and resource crunch. The study concludes that lack of technical education and skills as well as adequate capital could limit the capability of respondents to adopt modern weaving techniques. These factors, particularly lack of technical education and skills and access to capital, could negate government policy and increasing interest in promoting entrepreneurship and innovation in the indigenous textile weaving sector. Similarly, lack of efforts by operators to improve technology and innovation capabilities in the sector by upgrading production process, improving design and packaging could be a major drawback that could limit their global competitiveness within the context of trade liberalization and increasing integration into the world market.

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Table 1. Location of Business by States and Towns in Southwestern Nigeria

No.	Location of Business	Frequency	Percent (%)
1.	Oyo State	103	38%
	(a) Oyo	31	10%
	(b) Ibadan	22	8%
	(c) Iseyin	29	12%
	(d) Okeho	8	3%
	(e) Saki	13	5%
2.	Osun State	27	10%
	(a) Osogbo	27	10%
3.	Ondo State	26	10%
	(a) Owo	26	10%
4.	Ekiti State	53	19%
	(a) Ado-Ekiti	53	19%
5.	Ogun State	42	15%
	(a) Ijebu-Ode	26	10%
	(b) Abeokuta	16	6%
6.	Lagos State	22	8%
	(a) Mushin	22	8%
	Total	273	100%

Source: Analysis of Data, 2010.

Table 2. Socio-economic Characteristic of Weavers

Characteristic	Respondents	
	Frequency	Percentage (%)
(I) Gender		
Male	203	74
Female	70	26
(II) Marital Status		
Married	216	79
Single	46	18
Divorced	4	1
Widowed	5	2
(iii) Age		
10 – 20	12	4
21 - 30	90	33
31 – 40	84	31
41 – 50	51	19
51 – 60	26	9
61 – 70	10	4
(iv) Ownership Structure		
Sole Proprietorship	182	67
Partnership	20	7
Cooperative Society	25	9
Limited Liability Company	6	2
Family Owned Business	40	15
Total	273	100%

Source: Analysis of Data, 2010.

Table 3. Type of Production Loom

Description	Horizontal Loom		Vertical Loom	
	234	86%	39	14%
Oyo State	60	22%	3	1%
Osun State	25	9%	5	2%
Ondo State	44	16%	14	5%
Ekiti State	57	21%	5	2%
Ogun State	33	12%	12	4%
Lagos State	15	6%	-	-
Total	234	86%	39	14%

Source: Analysis of Data, 2010.

Table 4. Production Methods; Raw Materials and Types of Innovations

Description	Respondents	
	Frequency	Percentage
(i) Production Methods		
Manual Process	262	96%
Manual & Semi Automated Process	11	4%
Fully Automation Process	-	-
Total	273	100%
(ii) Sources of Raw Materials		
Domestic	76	28%
Foreign	7	3%
Both (Domestic&Foreign)	190	69%
Total	273	100%
(iii) Type(s) of Innovations		
Product	243	89%
Process Innovations	22	8%
Organization	8	3%
Total	273	100%

Source: Analysis of Data, 2010.

Table 5. Type(s) of New Product(s) Introduced

Description	Frequency		Percentage	
	Yes	No	Yes	No
New Product Formulation	207	66	76%	24%
Product Modification	170	103	62%	38%
Quality Improvement	162	111	59%	41%
Modification to Reduce Costs	71	202	26%	59%
Changing Packaging Design	11	262	4%	96%

Source: Analysis of Data, 2010.

Table 6. Description of Innovations

Description	Product Innovations		Process Innovations	
	Frequency	Percent	Frequency	Percent
Incremental innovations i.e. addition, modification etc	100	41%	10	44%
Innovations that is similar to others in the industry	99	37%	5	21%
Innovations that is fundamentally new to the world	27	11%	3	16%
Innovations that differs from others in the industry	17	7%	1	3%
Innovations that is the same as others in the industry	10	4%	3	16%
Total	253	89%	22	8%

Source: Analysis of Data, 2010

Table 7. How Innovations are acquired

Description	Respondents	
	Frequency	Percentage (%)
How Innovations are acquired:		
Through Personal Observation	240	92%
Through Intensive Scientific research (R&D)	23	8%
Total	273	100%

Source: Analysis of Data, 2010

Table 8. Reason(s) for not introducing any New Production Process

Description	Frequency	Percentage
Lack of Technical Skills	158	58%
Lack of Investment Funds	52	19%
No Serious Competition	30	11%
Stiffing Government Regulations	14	5%
Lack of Investment Opportunities	11	3%
Inadequate Investment Incentives	8	3%
Total	273	100%

Source: Analysis of Data, 2010.