



INDIGENOUS SILK PRODUCTION: A TOOL FOR SUSTAINABLE DEVELOPMENT IN NIGERIA

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ABSTRACT

The study examined indigenous silk production as a tool for sustainable development in Nigeria. The survey research design was adopted. Three research objectives were highlighted in this study. The population of the study is 619 respondents comprising the various categories of people: the Producers of silk yarns, the Weavers, the Traders and the Consumers. A sample of three hundred and ten (310) respondents indicating 50% of the population was used. The instrument used for data collection is the questionnaire. The data collected were analyzed using descriptive and inferential statistics. The findings from the study revealed that there are several factors that could aid the establishment and sustenance of indigenous silk production cottages in Nigeria but government-sponsored seminars and workshops, public and private partnerships and cottage expansion were not seen as among them. It was also discovered that the importance of indigenous silk production to Nigeria's economic development include direct employment and other job employment opportunities; use of mulberry plants by drug designers, pharmaceutical companies and herbal medicine practitioners; poverty alleviation; high returns on investment. It was also revealed that the issues affecting indigenous silk production in Nigeria are deforestation due to uncontrolled land development; consumption of silk moths as food by humans and livestock due to their high nutritive content; low investments in indigenous silk production processes amongst others. The study further concluded that, indigenous silk production is one of the oldest craft that have played an important role in the economic life of the people in Ondo and Oyo States and it provides a basis for solving unemployment in the States, which is a crucial aspect of the sustainable development goal. In light of the findings of the study, the researcher proposed recommendations to improve the overall situation indigenous silk production in Nigeria.

Keywords: Sustainable Development, Silk production, Indigenous, Nigeria.

INTRODUCTION

The importance of silk fibre to the production of lustrous and elegant fabrics in the textile industry cannot be over emphasized. Silk is a natural protein fibre which has been used for fabric production for centuries. Ogunduyile (2005) noted that the production of silk worldwide; its utility and contribution to clothing leaves no one in doubt that it has been a lucrative business. Literature reviews in the field of sericulture indicates that the development and use of silk is not recent. Its emergence has been traced to China and has since been embraced by South Korea, Japan, and India and later by some European countries. The production of silk makes use of effective family labour with simple technology which serves as a source of continuous cash flow for individuals. It has assisted government to earn foreign exchange thereby increasing the economy of the nation.

The International Sericultural Commission lists Nigeria among the minor sericulture countries of the world engaged in the production of cocoons and raw silk in “negligible quantities”, other countries listed in this category are Kenya, Botswana, Zambia, Zimbabwe, Bangladesh, Colombia, Egypt, Nepal, Bulgaria, Turkey, Uganda, Malaysia, Romania and Bolivia (International Sericultural Commission, 2018). However, Negri (1976) noted that wild silk fibres have been used by various tribes in Nigeria for centuries. Wild silk from – *Anaphe Ambrizia Butler*, *Anaphe Carteri* were being harvested, spun, woven, dyed and sewn to beautiful attires and used by various cultures in Nigeria before independence. For centuries, traditional silk fabrics called *Sanyan* were made from silk harvested from the wild and undomesticated silk moth species by the Yoruba people in south-west Nigeria (Oyenyi, 2015). In other words, and without any evidence of technology transfer, while the Chinese were making silk from domesticated silkworms, the Yoruba people in Nigeria were also making silk from wild silkworms.

In addition, Ogunduyile (as cited in Olowookere, 2016) observed that the early *alaari*, *kijipa*, and *etu* were made from the wild silk fibres and were sewn into *gbariye*, *dansiki*, *dandogo* and *agbada* etc. According to Ogunduyile, it is on record that the use of wild silk materials got to a peak shortly before the First World War when the colonial government made attempt to establish a parachute making industry to fully utilize local silk which was considered to be more suitable. The use of fibres from the local silk worms began to give way when the First World War ended. Other factors, such as the negative attitudes of the colonial masters

to the growth of local industries, cheap imported fabrics from Europe and Asia, as well as the heavy and coarse nature of the fabrics made from the wild silk led to the rapid decline in the sector. The subsequent feasibility studies by United African Company (UAC) and the African silk Cooperative showed that the local silkworms were not in sufficient commercial quantity for exploitation. Ashiru (1989) noted that the fibre from the non-mulberry silk is not a recent development in Nigeria. Although the first official attempt to rear the imported larvae of *Bombyx Mori* was in 1963 when a team of experts arrived from India at the instance of the Oyo State Government. Since then, various efforts have been made by individual State Governments and Research Institutes with little success.

A report by Raw Material Research and Development Council of Nigeria (1989) revealed that the total silk fibres used in Nigeria textile industry up till 1979 were imported. It is observed that sericulture and silk production could be practiced at cottage level while the government establishes buying centers and provide conducive environment for growth. The products of the textile industry are of critical importance to the nation's economy. The value of silk as raw materials for textile sub-sector is equally of great importance. Textile has been a source of foreign exchange in the developed countries. It was the second highest employer of labour in Nigeria in the 1960s but the same cannot be said about it now.

More so, silk fibres from the local silk worms have been used extensively in Nigeria before and during the colonial period to improve the clothing culture of Nigerians. The use of the local wild silk was short-lived as a result of inadequate local silk worms, exploitation of host trees, and consumption of the silk moth insects and the strenuous processes involved. In an attempt to revive the industry, various efforts have been made by individual researchers, governments, and research organizations in Nigeria. Some of the researchers introduced the cultivation of the silk *Mori Bombyx* worms and established mulberry farms to provide adequate leaves. These efforts could not be described as successful as the Raw Material Research and Development Council noted in 1979 that 100% of the silk fibres used in the Nigerian textile industry were imported. The Nigeria textile industry has therefore been losing its ability to compete against the foreign enterprises. The history of silk in Asia indicates that silk production could be practiced at cottage level with simple technology under a conducive environment.

However, writing on the developmental status of Nigeria, Clark and Phil (2016) maintained that Nigeria is presently at crossroads as it tackles the arduous task of diversifying her economy away from a more than 90% oil-based economy to

one which is more balanced and stable, even in the face of ever-dwindling oil prices. According to Clark and Phil, there are more people from diverse backgrounds today talking about sustainable development of the country. For Nigeria and other developing countries in the world, poverty alleviation is perhaps the most important focal point of developmental efforts. This fact is well articulated in the Millennium Development Goals (MDGs) targeted at eradicating extreme hunger and poverty in 189 member countries of the United Nations (UN). In order to achieve more success in the global developmental imperatives, in the year 2015 (fifteen years after the MDGs were established) the MDGs were further crystallized into seventeen (17) measurable, universally-agreed objectives, tagged "Sustainable Development Goals" (SDGs), yet again, poverty eradication came up on top (Ayoade, 2018). Hence, indigenous silk production presents a great opportunity in closing the gap between the rich and the poor. Since the end-product users are mostly from the higher economic groups, money flows mostly from the high-end groups to the low-end groups as the majority of the financial benefits of this industry goes directly to the rural households. Despite this knowledge, research efforts in indigenous silk production which commenced in Nigeria in the 1930s still have low records on its achievements till date. It is therefore pertinent to appraise the efforts being made in the indigenous production of silk and its contribution to the sustainable development of the Nigerian economy.

STATEMENT OF THE PROBLEM

Silk fibres are important raw materials for the production of elegant fabrics in all civilizations. Silk business is, without doubt, a good candidate for poverty alleviation in a developing country such as Nigeria due to its high employment potential. It is estimated that the production of silk can generate employment at 11-man days per kg of raw silk production (in on-farm and off-farm activities) throughout the year (Ayoade, 2014). This potential to generate employment, especially in rural areas, makes the indigenous production of silk an excellent tool for rural reconstruction and development. Other reasons advanced for silk production as a viable tool for national development includes its high employment potential (since agro-based businesses do not require as much technological know-how and training as petroleum business), wealth redistribution potential (since major portion of the share of income goes to the cocoon farmers, unlike oil production where the refiners and dealers make the bulk of the profit), low gestation and high returns (Ayoade, 2014). However, preliminary observations by the researcher as well as several researches

(Olowokeere, 2016; Ayoade, 2018) have revealed that despite the benefits associated with the indigenous production of silk, the traditional silk industry is yet to make its mark in the Nigerian economy because of the numerous drawbacks facing indigenous silk production which include unfavourable government policies, natural and man-made factors amongst others. Could these be attributed to the lack of attention paid to indigenous silk production or lack of appraisal of this traditional industry in the light of the sustainable development goals? Well versed with these issues, this study examined how indigenous silk production can be used as a tool for sustainable development in the nation.

OBJECTIVES OF THE STUDY

The general objective of this study is to examine indigenous silk production as a tool for sustainable development in Nigeria. The specific objectives are to:

- (1) identify the factors that could aid the establishment and sustenance of indigenous silk production cottages in Nigeria;
- (2) highlight the importance of indigenous silk production to the economic development of Nigeria; and to
- (3) examine the issues affecting indigenous silk production in Nigeria.

SCOPE OF THE STUDY

The scope of this study is limited to silk production and its consumption in Ondo and Oyo States, Nigeria. Specifically, Akure, Owo, and Ondo town in Ondo State; Iseyin and Oyo town in Oyo State have been used as case study. Ondo and Oyo States were chosen based on the facts that their inhabitants have been known for the production and consumption of silk fibres from locally woven fabrics.

REVIEW OF RELATED LITERATURE

History of Silk Production

Silk production or sericulture has a long and colourful history unknown to most people. The discovery of silk from the silkworm species *Bombyx Mori* occurred during 2700BC. Rosamund (2004) stated that the bride of Emperor Huang Ti, a 14-year old called Xi Ling Shi, discovered the invention of the first silk reel. The cultivation of the silkworm, spread through China making silk a highly valued commodity much sought after by other countries. Another story cited Empress Si-Ling-Chi as the first producer of silk fiber, from which she made a silk robe for her husband. From antiquity until the more recent establishment of the Chinese Republic, she was venerated as the Goddess of silkworm, Bernard (1983) and Marjory (1977) observed that the Chinese who were the first to cultivate the

silkworm and developed a silk industry endeavoured to keep the source of the raw material secret for a long time and maintained a virtual monopoly of the silk industry.

The Old Testament (Ezekiel 16:10) indicated that silk was known in Biblical times in Western Asia, from which it was presumably transplanted to the Greek Island of the Aegean Sea. The Chinese are believed to have built up a lucrative trade with the west from the days of the Han Dynasty in the 2nd Century B.C. According to Bernard (1983), it is believed that silk was introduced to Europe by Alexander the Great in the fourth century B.C. As the desire for silk fabrics expanded, the interest in its production also increased. About three thousand years after its original discovery, the secret was stolen out of China. The mulberry silk moth became native to China and the Chinese had a monopoly of it for a long time. Eventually, other countries began to produce silk. India and Japan became the first to do so in about 300 AD. Silk had become a valuable commodity in the Western World and in 550 AD, the Emperor Justinian sent two Nestorian monks to China to smuggle back some moth eggs and mulberry seeds, which they did at the risk of their lives, concealing the precious goods in bamboo walking staffs. With the arrival of the silk eggs in Byzantium, in the 7th Century, the Arabs conquered the Persians, capturing their magnificent silks in the process. Along with Islam, they spread sericulture and silk weaving as they swept victoriously through Africa, Sicily, and Spain.

Rosamund (2004) added that silk manufacture eventually reached Europe and America. During the 18th and 19th Centuries, Europeans made several major advancements in silk production. By the 18th Century, England led Europe in silk manufacturing because of English innovations in the textiles industry. These innovations included improved silk-weaving looms, powered looms and the emergence of machine roller printing, between 1855 and 1865. It was the French scientist, Louis Pasteur, who discovered that this could be prevented through simple microscopic examination of adult silk moths. Much research was carried out on silkworms at this time, ultimately setting the stage for a more scientific approach to silk production. Hence, silk production today, is a combination of old and modern techniques.

However, Marjory (1977) observed that in the Nineteenth Century, it became apparent that sericulture could be profitable only in countries where labour was both plentiful and cheap. Thus, the silk industry especially sericulture was confined chiefly to China, Japan, Italy, and India. The weaving of fine silk fabric is a skilled craft in France, primarily in Lyons. Throughout the development of the industry, silk has maintained a position of great prestige and is still considered a luxury fiber. Silk is often called "the queen of fibers", a title well deserved by

virtue of its association with royalty, the care required in its culture, and the properties and characteristics with which it has been endowed.

Silk Production in Nigeria

Nigeria is one of the minor sericulture countries of the world engaged in the production of cocoons and raw silk in small quantities (International Sericultural Commission, 2018). Other countries listed in this category are Kenya, Botswana, Zambia, Zimbabwe, Bangladesh, Colombia, Egypt, Nepal, Bulgaria, Turkey, Uganda, Malaysia, Romania and Bolivia. For centuries, traditional silk fabrics called *Sanyan* were made from silk harvested from the wild and undomesticated silk moth species by the Yoruba people in South-West Nigeria (Oyeniya, 2015). This goes a long way to imply that while the Chinese were making silk from domesticated silkworms, the Yoruba people in Nigeria were also making silk from wild silkworms. However, the wild silkworms are different from their domesticated cousins available in China and elsewhere as they are not commercially viable in the production of silk since the use of technology was involved. As populations grew and demands for silk increased amidst the cutting down of trees on which those wild silkworms thrive by loggers, the demise of the traditional silk industry in Yoruba land was just a question of time (Ayoade, 2018). In anticipation of this scenario, the Forestry Research Institute of Nigeria (FRIN), Ibadan in an attempt to fill the gap, introduced mulberry sericulture to Nigeria in 1962 to prop-up the fledgeling sericulture industry (Ashiru, 1988). The venture failed as sericulture could not reach its potential as an Agro-Industrial enterprise in Nigeria due mainly to the insufficient Government – Private sector collaborative participation among several other reasons as noted by Ayoade (2014). However, Mulberry sericulture was re-introduced in Nigeria in 1992 by the old Ondo State Government under the leadership of the then Governor Bamidele Olumilua and in collaboration with Professor Musiliu Ashiru of the Forestry Research Institute, to explore mulberry sericulture as a panacea for unemployment and poverty alleviation among rural dwellers. This effort was supported by the Raw Materials Development Council (RMRDC) and today, lawyers' wigs and other clothing items made from silk produced in Ekiti, Oyo and Ondo States are available in the Nigerian market which means mulberry sericulture venture can actually prosper in Nigeria (Ayoade, 2018).

Sustainable Development in the Nigerian Context

The economic, social and environment pillars of sustainable development have been adequately embedded in many parts of the country's 1999 Constitution. In

particular, the Constitution states that the Federal Republic of Nigeria is “*a State based on the principles of democracy and social justice*”. The Constitution also promises to all Nigerian citizens’ justice encompassing the social, economic, political, equality of status opportunity and the dignity of the individual. With particular emphasis on the environmental pillar of sustainable development, Article 20 (sub-section 2), of the Constitution states that, “*the State shall protect and improve the environment and safeguard the water, air and land, forest and wild life of Nigeria*”. Key challenges of sustainable development are discussed and attempts to overcome these challenges analyzed.

Nigeria’s economic development in the last decade has witnessed some growth. Between 2002 and 2011, the economy grew at an average of 6.2 percent. Growth in the agriculture sector, the main non-oil sector of the economy, increased partly due to the agricultural policy and institutional support that government has consistently given to the sector, particularly growth enhancement support to farmers. By 2011, the population was estimated to be 164 million. Government recognizes that poverty and unemployment remain critical challenges to its efforts to enhancing the quality of life of the people (Federal Government of Nigeria, 2012).

For Nigeria and other developing countries in the world, poverty alleviation is perhaps the most important focal point of developmental efforts. This fact is well articulated in the Millennium Development Goals (MDGs) targeted at eradicating extreme hunger and poverty in 189 member countries of the United Nations (UN). In order to achieve more success in the global developmental imperatives, in the year 2015 (fifteen years after the MGDs were established) the MDGs were further crystallized into seventeen (17) measurable, universally-agreed objectives, tagged “Sustainable Development Goals” (SDGs), yet again, poverty eradication came up on top as the first of the seventeen goals (United Nations Development Programme, 2018).

In Africa, particularly Nigeria, given widespread rural poverty and small scale farming, agriculture plays significant roles in economic development and transforming agriculture, implies sustainable economic development for the nation. However, as noted by Nwankpa (2017), both the agricultural transformation itself and the contribution of agriculture to the rest of the economy depend on three important features: (1) the peculiarities of production function, (2) the importance of home consumption of output for the sector and (3) the role of agricultural sector as a source of reservoir. The design of agricultural policies that will unleash the potentials of agriculture in a country’s development efforts require a recognition of these features (Timmer, 1988)

Thus, in an attempt to know the current situation of silk production in the Nigerian economy, this paper examines the potentials of indigenous silk production in Nigeria as a tool for sustainable development.

Importance of Indigenous Silk Production to Economic Development

Any production process provides room for positive opportunities and benefits regardless of its magnitude. The production of silk involves three main different processes, which Ayoade (2014) stated to include (a) cultivation of mulberry plants otherwise called “Moriculture” which provides food for the silkworm larvae; (b) rearing of silkworms (Sericulture); and (c) reeling of cocoons which are the products of sericulture preparatory to silk reeling. According to Ayoade, while the first two parts of the process are purely agricultural in nature, reeling of cocoons to spin yarn is distinctly industrial and it is carried out either in cottage-type establishments or in large-scale factories called ‘filature’. Hence, the main areas of employment generation in the silk production venture include: mulberry cultivation, silkworm rearing, production and sale of silkworm eggs, silk reeling, threading and weaving, and fabrication of machines for both the small scale filature and/or big time miller.

In addition to providing direct employment to sericulturists, every part of the mulberry plant from the root to the leaves is medicinal which drug designers, pharmaceutical companies and herbal medicine practitioners have taken advantage of, to create tens of thousands of more jobs in the silk production industry. More so, the opportunities created by the production of silk are a potential for the alleviation of poverty in Nigeria as a result of employment opportunities it creates. It is estimated that indigenous silk production can generate employment at 11-man days per kg of raw silk production (in on-farm and off-farm activities) throughout the year (Ayoade, 2014). This potential to generate employment, especially in rural areas, makes sericulture an excellent tool for rural reconstruction and development.

Still, sericulture presents a great opportunity in closing the gap between the rich and the poor. Since the end-product users are mostly from the higher economic groups, money flows mostly from the high-end groups to the low-end groups as the majority of the financial benefits of this industry goes directly to the rural households (Ayoade, 2018). According to Gangopadhyay (2009), about 57% of the gross value of silk fabrics flows back to the cocoon growers with share of income to different groups as follows: 56.8% to cocoon grower, 6.8% to the reeler, 9.1% to the twister, 16.6% to the trader (Gangopadhyay, 2009).

Likewise, sericulture has a low gestation period and high returns on investment. Mulberry takes only six months to grow in order to commence silkworm rearing. Mulberry, once planted, will go on supporting silkworm rearing year after year for about 15 – 20 years depending on inputs and management provided. The cost per benefit ratio of investment in sericulture is 1.5 to 2.0. From the foregoing, sericulture can easily be incorporated into most women empowerment programmes since most sericulture activities, starting from mulberry garden management, such as leaf harvesting and silkworm rearing, are more effectively taken up by women. There have been success stories on this venture from many countries which include China, India, Japan, Brazil, Thailand, Vietnam, Indonesia, Iran, Sri-Lanka, Philippines, Bangladesh, Nepal, Myanmar, Turkey, Papua New Guinea, Mexico and Uzbekistan (Ashiru, 2015).

Issues affecting Indigenous Silk Production in Nigeria

Nigerian poor performance in agriculture despite its huge agricultural potentials stems from the various challenges that have undermined the development of the sector over the years. The major challenge to agricultural development since independence has been the neglect agriculture suffered as Nigeria discovered oil in commercial quantities in the late 1960s and the oil boom of the 1970s (Dim & Ezenekwe, 2013). Moreover, the distribution of infrastructure and employment opportunities in favour of urban areas using the 'affluence' of the oil revenue led to the exodus of young people from the rural areas ignoring agriculture and creating more urban poor (Nwankpa, 2017).

However, in an attempt to substitute for the waning indigenous silk production in Nigeria, the Forestry Research Institute of Nigeria (FRIN) imported accessions of mulberry trees and races of the Chinese *Bombyx mori* silkworms into Nigeria in the year 1962 but this endeavor failed to take off as a viable project. This was due to the lack of desire by government or private investors to fund projects that are not linked to petroleum because such require planning, follow through and the fact that the returns may not necessarily come as quickly and rapidly, unlike the quick cash available from petroleum (Ayoade, 2018).

In another development, Ashiru (as cited in Ayoade, 2018) posited that despite the fact that the cultivation of African wild silk appears to be much simpler than that of the exotic mulberry silkworm, the African wild silk is scarcely found in Africa today for a variety of reasons such as deforestation due to uncontrolled land development, which has been a major bane to the survival of the indigenous silk moths in Africa including members of the *Anaphe* and the *Epanaphe* species, particularly *Anaphe venata* (which is perhaps the most studied species of silk-

producing moth from Africa). In addition, Makinde, Fajuyigbe and Ajiboye (2015) lamented that, other factors responsible for the failure of indigenous silk production include the unprecedented socio-economic change that came upon Nigeria as a result of the discovery of crude oil, poverty and the consumption of silkmoths as food by humans and livestock due to their high nutritive content. Also, commenting on the issues affecting indigenous silk production in Nigeria, Ayoade (2018) maintained that there are a variety of factors militating against the development of the sericulture industry in Nigeria. According to Ayoade, these factors include the lack of commitment of research efforts to developing sustainable rearing regime for local breeds of silkworm and high yielding races outside the forest environment (i.e. domestication); lack of effective research and training programmes and the unavailability of adequate commitment by government and other stakeholders to build Nigeria's sericulture as an industry amongst others.

MATERIALS AND METHODS

Research Design

The study adopted the descriptive survey design. The design was adopted because the study is concerned with the collection of data for the purpose of describing the current conditions and situation of indigenous silk production in Nigeria.

Population and Sample

The population of the study is 619 respondents. This comprises of the various categories of people: the Producers of silk yarns (Sericulture centres in Ondo and Oyo States); the Weaver of silk yarns (Weavers in Ondo, Owo, Akure, Oyo and Iseyin); the Traders (those who sells silk products to the public) and the Consumers (the users of silk products). The researcher found out that it was not possible to collect data from the entire population since the population is a large one. A sample of three hundred and ten (310) respondents, that is, fifty (50%) of the population studied, were used. This sample was determined as recommended by Oghuvwu (2010), that if a population is in few hundreds, a 50% of the population could be used as a sample size. The convenience sampling technique was used by the researcher to select the sample. The breakdown of the population and sample of the different categories are represented in Table 1.

Table 1: Population and Sample

S/NO	Categories	Population	Sample
1	Producers of silk yarns (i.e. the population of sericulture Centres, Akure and Oyo State	55	28

	Mulberry Demonstrations, Ibadan) in Ondo and Oyo States		
2	Weavers of silk yarns in (Owo and Ondo towns in Ondo State and Oyo and Iseyin in Oyo State)	84	42
3	Traders of silk yarns/products in Ondo and Oyo States	96	48
4	Customers of silk products	384	192
Total		619	310

Source: Sericulture Centers in Ondo and Oyo States (2019).

Research Instrument

The instrument for data collection was a self-structured questionnaire titled “Indigenous Silk Production and Sustainable Development Questionnaire” (ISPSDQ). It was fashioned after the Likert Scale model. The questionnaire was able to address the issues highlighted in the objectives of the study.

Method of Data Analysis

The data collected were analyzed using the descriptive and inferential statistics. Frequencies were used to analyze the demographic data of the respondents; mean, frequencies and simple percentage were used to analyze the data received from the respondents. The Statistical Package for the Social Sciences (SPSS v23) was used for the data analysis.

DATA ANALYSIS AND INTERPRETATION

This section focuses on presentation of results and discussion of the findings.

Table 2: Response Rate

Table 2 shows the pattern of the administration and retrieval of copies of the questionnaire among the respondents.

S/NO	Categories	Sample 50%	Freq. returned	Percentage (%)
1	Producers of silk yarns	28	23	82
2	Weavers of silk yarns	42	37	88
3	Traders of silk yarns/products	48	38	79
4	Customers of silk products	192	149	78
Total		310	247	81

The total number of questionnaire collected and found useful amounted to a return rate of 81% (N = 247) out of 310 respondents that were sampled. This was found adequate and statistically convenient for further analysis and interpretation of results since 60% and above can be reliably used (Oghuvbu, 2010).

Table 3: Demographic Information

S/N	Demographics	Frequency (N)	Percentage (%)
Gender			
1	Male	96	39
2	Female	151	61
Age Range (Years)			
1	15 – 24	30	12
2	25 – 34	42	17
3	35 – 44	117	47
4	45 – 54	36	15
5	55years+	22	9
Marital Status			
1	Single	59	24
2	Married	148	60
3	Divorced	16	6
4	Widowed	24	10
Nature of Establishment			
1	Government-employed	44	18
2	Self-employed	105	43
3	Employer	31	12
4	Private but not self-employed	67	27
Size of Establishment			
1	Large-scale	11	5
2	Small-scale	52	21
3	Weaver	20	8
4	Trader	15	6
5	Customer	149	60

Total	247	100
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Source: Field Survey (2019)

Table 3 shows the demographic information retrieved from 247 respondents. Gender-wise distribution showed that 39% (N = 96) and 61% (N = 151) were males and females respectively which indicated that both gender classes were adequately represented and thus gender-biased judgement and opinions were relatively or completely eliminated.

The age distributions span across all sampled groups. Age range 35 – 44 years were most abundant (47%, N = 117) while 55years+ ranked lowest (9%, N = 22). With respect to marital status, a vast majority of respondents were married (60%, N = 148) followed by divorced (6%, N = 16).

Responses were also drawn on the bases of the respondents' nature of establishment and the table showed that respondents who were self-employed ranked highest (43%, N = 105) while the customers (60%, N = 149) constituted majority of the respondents.

Analysis of the Research Instrument

The research questions are answered in Tables 4, 5 and 6. The mean scores were used to ascertain the level of acceptance of an item and thus, remark provided accordingly.

Research Objective 1: Identify the factors that could aid the establishment and sustenance of indigenous silk production cottages in Nigeria

Data in Table 4 satisfies this objective.

Table 4: Factors that could aid the establishment and sustenance of indigenous silk production cottages in Nigeria

Factors that could aid the establishment and sustenance of indigenous silk production cottages in Nigeria	Mean	Remark
A major agricultural policy reform to boost specifically, silk production and its processes.	3.90	Accepted
Recapitalization of the Nigerian Agricultural Cooperative & Rural Development Bank to expand access to credit.	3.41	Accepted
Accelerate investments in agricultural infrastructure and marketing institutions.	3.12	Accepted
Increased incentives to both large and small-scale indigenous silk producers.	4.00	Accepted

Government-sponsored seminars and workshops on developmental trends in silk production should be organized periodically.	2.98	Not Accepted
Public and private partnerships to create and enhance indigenous silk production processes.	2.10	Not Accepted
Develop new and appropriate techniques and technologies to facilitate silk production and its processes.	3.31	Accepted
Create awareness on the essence of silk among the Nigerian populace to increase its consumption.	3.95	Accepted
Encourage the expansion of silk production cottages in Nigeria by creating more job opportunities.	2.24	Not Accepted
Improve the distribution of subsidized inputs needed for indigenous silk production.	3.56	Accepted
Aggregate mean	3.26	Accepted

*Criterion mean = 3.00, N = 247, SD = Standard Deviation

The results in Table 4 showed that majority of the items listed above are accepted as factors that could aid the establishment and sustenance of indigenous silk production cottages in Nigeria since the aggregate mean of 3.26 is higher than the criterion mean of 3.00. However, government-sponsored seminars and workshops, public and private partnerships and cottage expansion were not seen as factors that could aid the sustenance of indigenous silk production in Nigeria.

Research Objective 2: Highlight the Importance of Indigenous Silk Production to the Economic Development of Nigeria

Data in Table 5 satisfies this objective.

Table 5: Importance of Indigenous Silk Production to Nigeria's Economic Development

Importance of Indigenous Silk Production to Nigeria's Economic Development	Agree		Disagree		Total	
	No.	%	No.	%	No.	%
Indigenous silk production encourages poverty alleviation which leads to self-sustenance.	199	81	48	19	247	100
Provides direct employment and other job employment opportunities to sericulturists	210	85	37	15	247	100

and others involved in the silk manufacture business.						
Mulberry plants used in silk production are necessary in the processes of drug designers, pharmaceutical companies and herbal medicine practitioners	203	82	44	18	247	100
Indigenous silk production presents a great opportunity in closing the gap between the rich and the poor as returns goes to rural populace.	93	38	154	62	247	100
Indigenous silk production has a low gestation period and high returns on investment making it a fast-growing business.	180	73	67	27	247	100
Commercial production of silk leads to a reduction in rural-urban migration and more focus on agro-based activities.	51	21	196	79	247	100
Incorporation of silk production into empowerment programmes raises awareness on agricultural development of the nation.	78	32	169	68	247	100

The results in Table 5 show the respondents' opinions on the importance of indigenous silk production to Nigeria's economic development. As shown in the Table, the respondents agreed that: direct employment and other job employment opportunities (85%, N = 210); use of mulberry plants by drug designers, pharmaceutical companies and herbal medicine practitioners (82%, N = 203); poverty alleviation (81%, N = 199); high returns on investment (73%, N = 180) are some of the different ways in which indigenous silk production is important to Nigeria's economic development. However, closing the gap between the rich and the poor, reduction in rural-urban migration and incorporation into empowerment programmes were not seen as importance of indigenous silk production to Nigeria's economic development as revealed by 154, 196 and 169 respondents respectively. This result agrees with the words of Ayoade (2014) who outlined the relevance of indigenous silk production to include employment generation, reduction in poverty amongst others. The finding of this study, however, disagrees with the statement of Ashiru (2015) who proposed that silk

production can be incorporated into empower programmes in Nigeria to boost its economic development.

Research Objective 3: Examine the issues affecting indigenous silk production in Nigeria

Data in Table 6 satisfies this objective.

Table 6: Issues affecting Indigenous Silk Production in Nigeria

Issues affecting Indigenous Silk Production in Nigeria	Agree		Disagree		Total	
	No.	%	No.	%	No.	%
Neglect of agricultural activities by the government and the rural populace	192	78	55	22	247	100
Lack of desire by government and private investors to fund indigenous silk production projects	200	81	47	19	247	100
Deforestation due to uncontrolled land development	219	89	28	11	247	100
Consumption of silk moths as food by humans and livestock due to their high nutritive content	210	85	37	15	247	100
Lack of commitment of research efforts to develop sustainable rearing regime for local breeds of silkworms and high yielding races outside the forest environment	184	74	63	26	247	100
Lack of structure put in place for sorting and standardizing the quality of cocoons produced.	197	80	50	20	247	100
Low investments in indigenous silk production processes	202	82	45	18	247	100
Absence of rural market institutions	176	71	71	29	247	100

Table 6 presents the issues affecting indigenous silk production in Nigeria. As shown in the Table, the respondents agreed that: deforestation due to uncontrolled land development (89%, N=219); consumption of silk moths as food by humans and livestock due to their high nutritive content (85%, N=210); low investments in indigenous silk production processes (82%, N=202); lack of desire by government and private investors to fund indigenous silk production

projects (81%, N=200); neglect of agricultural activities by the government and the rural populace (78%, N=192); lack of commitment of research efforts to develop sustainable rearing regime for local breeds of silkworms and high yielding races outside the forest environment (74%, N=184); and absence of rural market institutions (71%, N=176) are the issues affecting indigenous silk production in Nigeria. This finding supports the statements of Nwankpa (2017) and Ayoade (2018) who highlighted numerous challenges facing indigenous silk production in Nigeria to include deforestation, neglect of agricultural activities by the government and rural populace, amongst others.

CONCLUSION

Indigenous silk production is a vocation which involves the production of silk through the rearing of silkworms to produce cocoons from which silk yarns are reeled. It is a labour-intensive agro industry ideally suited to developing countries. It rightly fits into the socio-economic structure of the rural area and can serve as an effective tool for rural reconstruction, benefiting the weaker section of the society. It plays a significant role in transferring wealth from the rich class to the poor section of the society since the affluent (rich) class mostly utilizes silk. This study has dealt with the production of silk in Ondo and Oyo States of Nigeria, using Akure, Owo, and Ondo in Ondo town, Iseyin and Oyo in Oyo town as study areas. This study was able to identify the factors that could aid the establishment and sustenance of indigenous silk production cottages in Ondo and Oyo States, Nigeria. It also highlighted the importance of indigenous silk production to Nigeria's economic development and examines the issues affecting indigenous silk production in Nigeria. In conclusion, therefore, indigenous silk production is one of the oldest craft that have played an important role in the economic life of the people in Ondo and Oyo States and it provides a basis for solving unemployment in the States, which is a crucial aspect of the sustainable development goal.

RECOMMENDATIONS

In light of the findings of this study, the following recommendations are put forward:

Government and Research organizations should set up a professional body that is similar to that of the Nigerian Cotton Board to monitor the various aspects of indigenous silk production cottages in Nigeria. Also, the producers of silk and weavers should be educated, through organized seminars which will expose them to modern day technology. The Research organization and Government

should grant soft loans to farmers, provide modern equipment that could help to raise quality silk yarns. In addition to that since some few sericulture centers are engaged in silk yarn production, there is the need for stakeholder in the States to support indigenous silk production techniques through exhibitions of their products so as to encourage practitioners.

Also, good quality silk yarns are important to the survival of textile industries, every effort should be made to encourage sericulture farmers to cultivate good quality silk yarns. In this regard, an agency to take charge of the sector in providing funds, fertilizers, insecticides, training and extensions services should be established by the State governments. Research organizations and Governments should look into the establishment of viable sericulture centers and mulberry orchards, where training of programmes will be organized at States and local government levels to prepare informational materials geared specifically towards the rearing of silkworms, cultivation of mulberry farms and the marketability of the cocoons produced.

The State Governments should look into ways of encouraging and empowering the youths into the art of silk production and weaving rather than looking for white collar jobs that are not available anyway. Apart from that, government should declare the industry as a special area considering its position as a provider of clothing which is one of the essential means of livelihood. It is particularly important to point out that food, clothing and shelter are the basic needs of man for survival, and it is necessary for a nation to attain self-sufficiency in providing these basic needs. Also the funding of the modern sericulture centers should be done by the government, private organizations, and research institutes, as well as providing necessary materials needed to run series of publications and research.

Furthermore there is the need for the State Government, private organizations, and research institutions to support the establishment of accredited and independent silk testing centers for routine tests of locally produced and imported cocoon and silk products. They should also help in supporting small and medium scale silk enterprises started by farmers associations and individuals which will help in promoting silk industry in the States. In addition, the States Government of both States should undertake the promotion of silk products both locally and internationally through exhibitions to the public.

REFERENCES

- Ashiru, M. O. (1988). The frequency distribution of eggs and larvae of *Anaphe venata* Butler (*Lepidoptera: Notodontidae*) on *Triplochiton scleroxylon* K. Schum. *International Journal of Tropical Insect Science*, 5(1), 587 - 592.

- Ashiru, M. O. (1989). The food value of the larvae of *Anaphe venata* Butler (*Lepidoptera: Notodontidae*). *Ecology of Food and Nutrition*, 22(4), 313 - 320.
- Ayoade, F. (2014). *Introduction to mulberry silk farming in Nigeria*. Lagos, Nigeria: Merciful Digital Prints Publishers. ISBN: 978-978-939-4050
- Ayoade, F. (2018). Sericulture as a tool for sustainable national development in Nigeria - The way forward. *Asian Research Journal of Agriculture*, 8(4), 1 - 12.
- Bernard, P. C (1983). Textile fiber to fabrics. USA: Congress Publication, 290 - 303.
- Clark, E. V., & Phil, D. (2016). The politics of oil in Nigeria: Transparency and accountability for sustainable development in the Niger Delta. *American International Journal of Contemporary Research*, 6(4), 76 - 82.
- Dim, C., & Ezenekwe, U. (2013). Does agriculture matter for economic development? Empirical evidence from Nigeria. *Journal of Finance & Economics*, 1(1). North America: Science and Education Centre.
- Federal Government of Nigeria (2012). Nigeria's path to sustainable development through green economy. *Country Report to Rio+20 Summit*. United Nations Conference on Sustainable Development.
- Gangopadhyay, D. (2009). *Sericulture industry in India - A review*. Indian Science and Technology, 1 - 6.
- International Sericultural Commission (2018). *Silk industry statistics*. Retrieved from <http://inserco.org/en/statistics>
- Makinde, D. O., Fajuyigbe, M. O., & Ajiboye, O. J. (2015). Nigerian textile industry: A tool for actualising economic stability and national development. *European Journal of Business and Social Sciences*, 4(8), 331 - 344.
- Marjory, L. (1977). *Introductory textile science* (3rd ed.). London Library of Congress Cataloging in Publication Data, 108 - 111.
- Negri, E. (1976). *Nigerian body adornment*. Lagos: Nigerian Magazine.
- Nwankpa, N. N. (2017). Sustainable agricultural development in Nigeria: A way out of hunger and poverty. *European Journal of Sustainable Development*, 6(4), 175 - 184. Doi: 10.14207/ejsd.2017.v6n4p175
- Oghuvwu, V. (2010). The use of the Internet among academic staff of Delta State colleges of education in Nigeria. *Journal of Research in Education and Society*, 1(2&3), 155 - 160.
- Ogunduyile, S. R. (2005). *Cottage textile production: Step out of poverty*. Inaugural Lecture Series 41, Federal University of Technology, Akure, Ondo State.

- Olowookere, P. O. (2016). The Yoruba clothing culture, its forms and contents. *Journal of Pristine*, 12(1), 120 – 132.
- Oyeniya, B. A. (2015). *Dress in the making of African identity: A social and cultural history of the Yoruba people*. Cambria Press.
- Raw Material Research and Development Council (RMRDC) (1989). *Report on techno-economic survey on textiles wearing apparel and leather. Supplementary on Carpet Sub-Sector and Recommended Projects (2)*, 44 – 48.
- Rosamund, R. (2004). *History of silk*. The Vegan Society. Retrieved from <http://www.vegansociety.com/Reference/Animal/Silk.aspx>
- United Nations Development Programme (2018). *Nigeria: A new sustainable development agenda*. Retrieved from <http://www.ng.undp.org/content/nigeria/en/home/post-2015.html>

APPENDIX I

INDIGENOUS SILK PRODUCTION AND SUSTAINABLE DEVELOPMENT QUESTIONNAIRE (ISPSDQ)

SECTION A: BIO-DATA OF THE RESPONDENT

Instruction: Please tick [] the appropriate boxes that suits your responses

Gender: Male [] Female []

Age: 15 - 24 [] 25 - 34 [] 35 – 44 [] 45 - 54 [] 55years+ []

Marital Status: Single [] Married [] Divorced [] Widowed []

Nature of Establishment: Government employed [] Self-Employed []

Employer [] Private but not Self Employed []

Size of Establishment: Large scale [] Small scale [] Weaver [] Trader []

Customer []

SECTION B: FACTORS THAT COULD AID THE ESTABLISHMENT AND SUSTENANCE OF INDIGENOUS SILK PRODUCTION COTTAGES IN NIGERIA

S/N The following factors would aid the establishment and sustenance of indigenous silk production cottages in Nigeria SA A D SD UD

1. A major agricultural policy reform to boost specifically, silk production and its processes.

2.	Recapitalization of the Nigerian Agricultural Cooperative & Rural Development Bank to expand access to credit.
3.	Accelerate investments in agricultural infrastructure and marketing institutions.
4.	Increased incentives to both large and small-scale indigenous silk producers.
5.	Government-sponsored seminars and workshops on developmental trends in silk production should be organized periodically.
6.	Public and private partnerships to create and enhance indigenous silk production processes.
7.	Develop new and appropriate techniques and technologies to facilitate silk production and its processes.
8.	Create awareness on the essence of silk among the Nigerian populace to increase its consumption.
9.	Encourage the expansion of silk production cottages in Nigeria by creating more job opportunities.
10.	Improve the distribution of subsidized inputs needed for indigenous silk production.

Key: SA – Strongly Agree; A – Agree; D – Disagree; SD – Strongly Disagree; UD - Undecided

SECTION C: IMPORTANCE OF INDIGENOUS SILK PRODUCTION TO THE ECONOMIC DEVELOPMENT OF NIGERIA

S/N	The following are the ways in which indigenous silk production is important to Nigeria's economic development:	A	D
1.	Indigenous silk production encourages poverty alleviation which leads to self-sustenance.		
2.	Provides direct employment and other job employment opportunities to sericulturists and others involved in the silk manufacture business.		
3.	Mulberry plants used in silk production are necessary in the processes of drug designers, pharmaceutical companies and herbal medicine practitioners		

4.	Indigenous silk production presents a great opportunity in closing the gap between the rich and the poor as returns goes to rural populace.
5.	Indigenous silk production has a low gestation period and high returns on investment making it a fast-growing business.
6.	Commercial production of silk leads to a reduction in rural-urban migration and more focus on agro-based activities.
7.	Incorporation of silk production into empowerment programmes raises awareness on agricultural development of the nation.

Key: A – Agree; D – Disagree

SECTION D: ISSUES AFFECTING INDIGENOUS SILK PRODUCTION IN NIGERIA

S/N	The following are the issues affecting indigenous silk production in Nigeria:	A	D
1.	Neglect of agricultural activities by the government and the rural populace		
2.	Lack of desire by government and private investors to fund indigenous silk production projects		
3.	Deforestation due to uncontrolled land development		
4.	Consumption of silk moths as food by humans and livestock due to their high nutritive content		
5.	Lack of commitment of research efforts to develop sustainable rearing regime for local breeds of silkworms and high yielding races outside the forest environment		
6.	Lack of structure put in place for sorting and standardizing the quality of cocoons produced.		
7.	Low investments in indigenous silk production processes		
8.	Absence of rural market institutions		

Key: A – Agree; D – Disagree