Indigenous Knowledge Management Practices: Looking at the Historical Perspectives of Palm Oil Extraction in Ologbo Ikpoba-Okha of Edo State of Nigeria.

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Abstract

Palm oil is one of the most commonly produced vegetable oils in the world, palm oil provides more oil per hectare than soya beans, oilseeds or sunflower seeds. Although palm oil is a better source of vegetable oil than other types of crude oil, there is concern that the increase in the amount of extraction of palm oil done these days if not monitored could have environmental and social impact on the environment. The significance of this research is to highlight the historical KM practices of the indigenous and contemporary palm oil producers in Ologbo Ikpoba-Okha of Edo State and specifically explore how KM information is gathered, stored and disseminated. Also, this research did not only discuss the issue of palm oil extraction in Ikpoba-Okha Nigeria, but also further promote economic development in various areas, especially the development of industries. This research also aimed to understand and highlight the current practices of palm oil extraction used by contemporary farmers and current methods used by indigenous farmers (traditional) in Ikpoba-Okha of Edo State Nigeria and how to generate new ideas and sustainable ways of natural resources management of palm oil extraction and also enhance palm oil extraction process in an eco-friendly way.

This research contributes to the existing debate by building on the Lee and Choi (2003) Enabler Framework to link indigenous and current knowledge management practices of indigenous and contemporary palm oil producers. A qualitative research approach through 40 interviews was conducted on 20 indigenous farmers and 20 SMEs and medium size farmers (contemporary farmers) to investigate the indigenous and contemporary KM approaches of palm oil extraction in Ologbo Ikpoba-Okha of Edo State. This study has contributed to practice by extending the (Lee nd Choi, 2003), enabler framework by exploring it within IK and contemporary debate. Secondly, the investigative approach used has highlighted areas such as KM practices of indigenous farmers and those of contemporary palm oil farmers and areas where IK is especially weak and how that, can improve KM among palm oil farmers in Ologbo Ikpoba-Okha. Thirdly, this study has contributed to KM from a developing context as Nigeria is a developing country and the study of KM is dominated by Western literature (Abioye, et al., 2017) and so the study of IK contributes to IK practices of palm oil extraction, and finally the study had been able to explore KM in the agro business sector of Ologbo in Ikpoba-Okha area of Edo State Nigeria. This research also contribute to practice by helping policy makers develop strategies for supporting Indigenous famers in the area of KM. Secondly, both indigenous palm oil farmers and contemporary farmers have identified areas that they face challenges and this can be a starting point to tackle the issues. Thirdly, with Nigeria palm oil still barred from some countries, the findings will help to address areas of KM that will help both contemporary and Indigenous farmers develop knowledge. Lastly- with the high unemployment in Nigeria, the enabler framework could serve as a guide developing KM policies for local palm oil farmers.

Keywords

Enabler – Framework, **KM –** Knowledge Management**, IK –** Indigenous Knowledge**, Ologbo Ikpoba-Okha** – Local Government area In Edo state Nigeria (Research Location), **Palm Oil**, Contemporary KM Palm Oil Extraction

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List of Tables and Figures

List of Acronyms Used

KM…… Knowledge Management
ICT……. Indigenous Knowledge Intelligence
IEEE……...The Institute of Electrical Electronic Engineers
IKM……Indigenous Knowledge Management
IK……Indigenous Knowledge
MDPI……. Multidisciplinary Digital Publishing Institute
NGO……None Governmental Organisation
NIFOR…… Nigeria Palm Oil Research Institute
OPT……. Oil Palm Trunk
PORLA……...Palm Oil Registration & Licensing Authority
RPO……Refined Palm Oil
SAP……..…. Software Application and Products
SMEs……..... Small and Medium Size Enterprises
WUR……. Wageningen University Research
WWF……. World Wildlife Fund

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DECLARATION

This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

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STATEMENT 1

This thesis is the result of my own investigations, except where otherwise stated. Where correction services have been used the extent and nature of the correction is clearly marked in a footnote(s). Other sources are acknowledged by footnotes giving explicit references. A bibliography is appended.

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CHAPTER 1

Indigenous Knowledge Management Practices: Looking at the Historical Perspectives of Palm Oil Extraction in Ologbo Ikpoba-Okha of Edo State of Nigeria.

1.0: Introduction*:*

The Significance of this study is to look at the importance of Knowledge management of indigenous practices of palm oil extraction in Ologbo Ikpoba-Okha of Edo State Nigeria and how this study can influence KM of palm oil extraction around the world. This study also discussed the issue of palm oil extraction in Ikpoba-Okha Nigeria and ways of using palm oil extraction to further promote economic development in the area, especially the development of Agro industries which palm oil farming belongs. Certain measures to replace old extracting practices and improve palm oil production practices is also discussed in this research, (Colnar and Dimovski, 2017) and (Ebhuoma, 2020).

This research looked at what KM is about; its importance and the role KM can play in development of indigenous Knowledge practices. This research also discussed the impact of palm oil as a composite material in Nigeria's agricultural branding economy (Chendov, 2018). The research also considered palm oil extraction practices of small and medium-sized businesses in the target area, mainly to identify old and modern practices that can be developed.

The study also extended the Lee and Choi (2003), enabler framework in the literature review section by exploring it within IK and contemporary KM practices to highlight areas where KM practices of contemporary farmers and those of indigenous farmers and areas where indigenous

farmers are not doing so well and how it can be improved in Ologbo Ikpoba-Okha and developing countries, also an empirical illustration was done using the (Lee and Choi 2003) Enabler framework.

The research methodologies, philosophies and strategies used in carrying out this research was also discussed and analysed.

The findings in this research will highlight areas that can help policy makers develop strategies for supporting indigenous famers in the area of KM and also help them identify areas that can help in protecting the local environment and promote sustainability for their businesses.

This research will contribute to KM from a developing context as Nigeria is a developing country and the study of KM is dominated by Western literature (Khatun et al., 2020) and so the study of IK will contribute to IK practices of palm oil extraction in both developing and developed economy.

This research, will help to highlight the environmental issues associated with palm oil extraction around the world because palm oil production is currently one of the main causes of the world's destruction of tropical forests, (Khatun, et al., 2020), also palm oil extraction has led to deforestation in a lot of developing countries this study will highlight the advantages of eco-friendly palm oil extraction methods.

Furthermore, this research has exposed what indiscriminate use of pesticides and fertilizers can cause on aquatic biodiversity of the environment if eco-friendly palm oil extraction practices are ignored (Pratama, et al., 2021). in addition to palm oil extraction being one of the main drivers of human-induced climate change hopefully due to this study big palm oil brands in developing countries around the world will commit to using only responsible palm oil, produced without causing the destruction of tropical forests which are rich in carbon (Varkkey, et al., 2018).

Finally, hopefully this research will influence indigenous palm oil farmers to adopt modern extracting methods usage of KM software’s in their businesses for better practices.

1.1: Scope of Study

The study focuses on the impact of palm oil extraction on Nigeria economy. The scope is limited to discuss issues only related to palm oil extraction in Ologbo Ikpoba-Okha of Edo State of Nigeria. More details on scope are presented in chapter 3.

1.2: What is the issue?

This research searched to find out how the indigenous people of Ologbo in Ikpoba-Okha, of Edo carried out palm oil extraction in the past and further explained how powerful the small and medium-sized SMEs (contemporary farmers) in Ologbo are today in the field of palm oil extraction. The researcher collected a range of information for this study to examine the historical perspective of indigenous practices used by palm oil farmers in Ologbo Ikpoba-Okha in normal wealth management (palm oil extraction) (Ammourah and Pitchay, 2020). The research, also looked at development of KM practices of palm oil extraction as the innovation will bring about fast and reliable way of palm oil extraction and how this innovative information can be easily communicated (Santoro et al.,2018) native of Ikpoba-Okha Edo State will open the research to nearby researchers and indigenous people.

1.3: The Problem

According to (Gyamfi, 2017) not much has been documented about the Nigeria palm oil economy or business, although there were few trading points built by the British colonial government these

where only for exports to United Kingdom and even so not much was documented about this (Komleva et al.,2018).

Indigenous Africans were unable to innovate in the past and information was mainly exchanged by word of mouth according to (Colnar and Dimovski, 2017). This knowledge management research (KM) combined with Ologbo's personal historical indigenous palm oil extraction practices will enable the classification, query, interpretation and contextualisation of information that has emerged over time to help indigenous peoples think about old and new ways of doing things (Amadi et al., 2020). There are also difficulties in understanding new (contemporary) KM practices of palm oil extraction, this research also consider the palm oil extraction process practices of small and medium-sized businesses in the target area, mainly to identify modern practices that can be developed more. A lot of the medium size oil company workers in Ologbo in Ikpoba-Okha claim to take pride in being from the local region and believe they are making a difference through their work in palm oil business in the Ologbo local government area. Understanding IK is important for contemporary organisations as it will allow employees working for such SMEs to identify with their roots, accordingly, this ethnic identification may influence an employee's (people) sense of organisational solidarity (Pepple, D.G., 2019).

Looking at the historical overview of palm production in Nigeria in the past and present, not much have changed, even the Nigeria palm oil is not accepted in some part of the world due to impurities in the oil, a lot of indigenous palm oil farmers who use the traditional palm oil extraction methods tend to have cleaner and better palm oil after processing it the traditional way, but they cannot extract their oil in bulk supply due to lack of man-power and mechanized machinery (Bayat et al., 2018) this research looked at ways this kind of situation can be resolved. There have been disappointing results in palm oil farming in Nigeria in Ologbo mainly due to lack of proper information data, (Igwe et al., 2018) but

currently the Nigeria agriculture Ministry support farmers with such information. This research aims to develop a framework for linking IK and contemporary KM to enable both indigenous oil palm producers and contemporary producers to exchange knowledge (Yulianti et al., 2018) According to the World Commission on Environment and Development (1997), manageable improvement is progress in solving current problems without affecting people's ability to solve their own problems in the future.

Recognizing and harnessing the value of indigenous knowledge (IK) is a good step for ICT and development of IK management of palm oil extraction in developing countries (Amadi et al., 2020), if Indigenous knowledge is not neglected in terms of methods and documentations, plans should be made to save indigenous knowledge as it can potentially lead to a strengthening and empowerment of youths in the country and the community, which will bring development in the community and Nigeria in general. Although there may be a connection between the use of IK and economic development, there is still the problem on how to store, disseminate and transfer such knowledge, (Cerchione and Esposito, 2017) and this research offer some solutions from its findings.

According to (Amadi et al., 2020), Knowledge Management (KM) is generated in western and global academies, research institutions and private companies, the network of agricultural countries uses the knowledge of the residents in the organisation or community as a basis for decision-making for culture, food security, human and biological well-being, the knowledge gained is also used as an asset and managed for social and professional improvement and other important exercises (Chendov, 2018).

1.4: Research Aims and Objectives

- To explore, from a historical perspective the palm oil extraction practices in Ologbo Ikpoba-Okha of Edo state of Nigeria and identify models and develop or adapt unique eco-friendly practices.
- To identify if any areas for improvement for the indigenous farmers practices and what lessons they can learn from adapting new KM practices.
- To explore the current practices of palm oil extraction used by small and medium palm oil producers in the Ologbo Ikpoba-Okha area to identifying how these practices impinge on the local forests and wildlife habitats.
- To utilize the indigenous practices of palm oil extraction of the people of Ologbo in Ikpoba-Okha to protect the local environment, wildlife and promote the eco system of the area to generate sustainability in of their business.

1.5: Research Objectives

- To understand and highlight the historical KM practices of palm Oil extraction of the people of Ologbo in Ikpoba-Okha of Edo State of Nigeria – the specific ways the information was gathered, stored and disseminated.
- To understand and highlight the current practices of palm Oil extraction and KM of the Indigenous farmers (traditional), SMEs, Small and medium producers (Contemporary farmers) in Ologbo Ikpoba-Okha of Edo State of Nigeria

- To use the historical practices of the palm oil farmers in Ologbo in Ikpoba-Okha to generate new ideas and find new sustainable ways of natural resources management of palm oil extraction.
- To improve and enhance the processes of palm oil extraction practices of the indigenous people of Ologbo in Ikpoba-Okha of Edo state of Nigeria in an eco- friendly manner.
- To develop a framework for understanding indigenous and current knowledge management practices of palm oil extraction.

1.6: Research Questions

RQ1: How was KM of palm oil extraction done in the past, how was information gathered, stored and disseminated then?

RQ2: What are the current palm oil extraction practices your business (contemporary and indigenous farmers) use currently?

RQ3: How does your business generate new ideas and sustainable ways of palm oil extraction?

RQ4: What ways can your business enhance and improve palm oil extraction in Ologbo Ikpoba-Okha?

1.7: Summarised Key Research Findings

Findings 1: information for palm oil extraction processing in the past in Ologbo Ikpoba-Okha was gathered and shared by words of mouth, from generation to generation by the indigenous palm oil farmers, there were no KM systems in place for use by the indigenous farmers.

Findings 2: Contemporary palm oil farmers (medium and SMEs) currents practices in Ologbo Ikpoba-Okha use a systematic palm oil processing methods which are done in stages which involved use of industrialise machineries which required training by the farmers and their employees to operate. KM software systems such as Agrisoft system were used by most contemporary farmers to store and manage information on their current palm oil extracting practices. Both indigenous and contemporary palm oil farmers in their current practices share information on their practices through their local farmers unions and the branch of the Ministry of Agriculture in the state.

Findings 3: It was found by the researcher that indigenous and contemporary farmers needed more training and skills development , as well as current KM systems to help them in developing a sustainable palm oil extracting business, also development of technology, certified palm oil, financial support from the government will help sustainability in the business , regulatory palm oil farmers organisations such as Agenda 21 and Ecological Economic Zoning (EEZ) in Ologbo that helps to regulate palm oil extracting practices will help to promote sustainability.

Findings 4: The researcher found that to improve and enhance the palm oil extracting practices in an eco-friendly way, the cutting and burning down of trees and bush after harvesting should be stopped as this leads to deforestation and harm to the local habitat wildlife, there should be less usage of insecticides and pesticides by palm oil farmers as these chemicals cause damage to the local eco-system.

Findings 5: Operationalisation of the research model was done using the Lee and Choi (2003) Enabler framework, as it helped to identify areas indigenous farmers did not do well compared to contemporary farmers from knowledge creation to performance in areas of creation, innovation and organisation performance.

1.8: Summarised Contribution

This study has extended the (Lee nd Choi, 2003), enabler framework by exploring it within IK and contemporary debate. Secondly, the investigative approach has highlighted areas such as KM practices of indigenous farmers and those of contemporary palm oil farmers and areas where IK is especially weak and how that can improve KM among palm oil farmers in Ologbo Ikpoba-Okha. Thirdly, this study has contributed to KM from a developing context as Nigeria is a developing country and the study of KM is dominated by Western literature (Abioye, et al., 2017) and so the study of IK contributes to IK practices of palm oil extraction, and finally the study had been able to explore KM in the agro business sector of Ologbo in Ikpoba-Okha area of Edo State Nigeria.

1.9: Summarised Implication to Practice

This research has highlighted areas that will help policy makers develop strategies for supporting IK famers in the area of KM. Secondly, both IK and contemporary farmers have identified areas that they face challenges and this can be a starting point to tackle the issues. Thirdly, with Nigeria palm oil still barred from some countries the findings helps to address areas of KM that will help both contemporary and Indigenous farmers develop knowledge. Lastly- with the high

unemployment in Nigeria, the enabler framework could serve as a guide in developing KM policies for local palm oil farmers.

CHAPTER 2: LITERATURE REVIEW

2.0: Introduction

In this section, the Prisma systematic literature review chart was used to do a systematic review of inclusion and exclusion using top journals, this section also discussed the Nigeria economy, the history of palm oil extraction in Nigeria and a brief history of Benin city where the research was done. Also, this section looked at KM in relation to indigenous practices, the importance of KM and the importance of KM and also the different types of KM.

This section also looked at conceptual clarification of KM and different indigenous KM systems and types of applications where discussed. The Enabler framework used for this research is discussed in association with other conceptual frameworks and theoretical frameworks briefly. The 5 research objectives were divided into 5 themes which were reviewed and supported with current literatures looking at the historical and current palm oil extraction practices in Ologbo Ikpoba-Okha of Edo State Nigeria.

2.1: Prisma Systematic Literature Review

Article Selection Criteria

The articles examined in this review were chosen from data bases such as JSTOR, Research Gate, Science Direct, MDPI and IEEE, all the articles chosen where empirical literature in the areas of Knowledge Management and Indigenous practices of palm oil extraction, the rational for this was to find out historical and current knowledge management practices of palm oil extraction. A total of 400 articles were examined for this study.

Most of the articles used in this research used empirical investigation using qualitative and quantitative research approach, this was so that the findings on KM and indigenous and contemporary palm oil extraction practices were premised on research with direct evidence on contemporary and indigenous palm oil farmers.

Sources of Data and Search Strategy

The search phrases used for this research study included phrases related to Indigenous Knowledge Practices. Such terms were classified as (Knowledge management, Indigenous palm oil extraction practices in Nigeria, Ologbo Ikpoba-Okha, SMEs, Medium and traditional palm oil farmers in Nigeria).

The researcher did a systematic literature review by adapting the Prisma chart, by doing research on different top journal articles and books that looked at the research topic on historical perspectives of palm oil extraction around the world and mainly in Nigeria and Ologbo Ikpoba-Okha of Edo state Nigeria and other related topics on palm oil extraction.

Results

Results from the search of databases mentioned earlier provided 400 articles that were considered potentially viable. In line with the selection criteria, 50 articles were chosen from the year 2017 to 2021, the results. **See Table 1**.

Selection of Studies

In line with the above article selection criteria, articles where first screened resulting in the exclusion of some papers, then again further articles screening was done on abstract review. Then the articles that were left following the abstract review was sourced from online

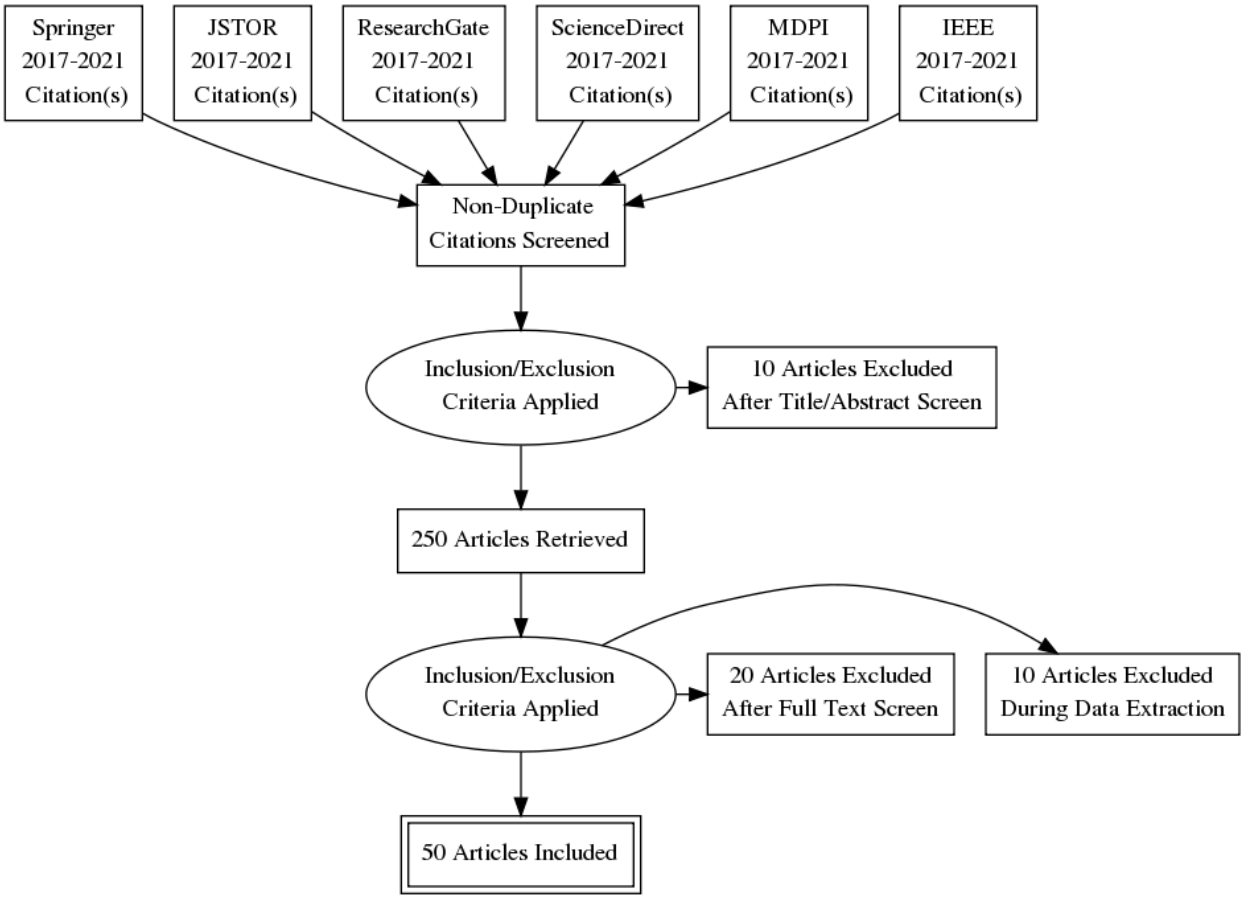
(UWTSD) UK university data base. Fifty articles were finally chosen for this review following access to the article text in full. See Fig. 1. For article selection criteria.

Table 1: Search Strategy

Search Strategy	
Keywords	Indigenous Knowledge Management Traditional Palm oil extraction practices Knowledge Management Practices
Outcome	SMEs, Medium and indigenous palm oil farmers
Context	Nigeria, Edo State, Ologbo Ikpoba-Okha, Africa
Timeframe	07/06/2021 to 30/08/2021

Fig 1: Prisma Adapted Chart (2021)

Adapted Prisma Systematic Literature Review Chart



Identified that had investigated indigenous knowledge management practices of palm oil extraction in Ologbo Ikpoba-Okha of Edo State Nigeria in West Africa. The range of dates were 2017 for the earliest to 2021 for the most recent. The studies had different designs and settings used and a range of different approaches which where both qualitative and quantitative (mixed methods) **See Fig 1** for summary of the selected articles.

2.2: LITERATURE GAP

Historical Gap in Literature

Relative to the identified different articles used in this research some gaps were identified by the researcher and these will be divided into two sections historical gap and current gap in literature.

Firstly, there was limited article tracing back to the historical overview of palm oil extraction in Nigeria prior to the 1960's although in the 1960's was when Nigeria enjoyed a boom in the palm oil business, (Yadav et al., 2020), as a result of this lack of research and articles in this early era of Nigeria booming palm oil business during the colonial British rule before Nigeria gained its independence, (Gyamfi, 2017) not much was documented then about the Nigeria palm oil economy or business, although there were few trading points built by the British colonial government these where only for exports to United Kingdom and even so not much was documented about these, (Komleva et al.,2018).

Secondly, another gap in the literature was as a result of a lot of the indigenous palm oil farmers in Ologbo Ikpoba-Okha and other parts of Nigeria, learnt their trade and skills from words of mouth (Yadav et al., 2020), lack of documented evidence or data with regards to the traditional methods of palm oil extraction practices prior to the 1960's, even the few data available was looking at the historical overview of palm oil extraction in Nigeria as a whole not much on individual cities or towns in Nigeria. A lot of the indigenous palm oil farmers learnt their skills by observing their parents' farming techniques which was passed down from generation to generation of palm oil farmers family, (Kayode et al., 2018)

There is also lack of articles on research on the role traditional palm oil extraction method played compared to the modern technology of palm oil machinery extraction process, (Bayat et al., 2018).

Current Gaps in Literature

There is a gap in documented evidence of current palm oil extraction practices in Nigeria and this view is supported by (Irivboje et al., 2021) who said is “only of recent that the Nigeria Ministry of Agriculture stated to support farmers by giving them information to develop their crop production and this view is supported by (Jellason et al., 2021).

There is also gap in the literature when it comes to looking at some of the current practices of palm oil extraction in Ologbo Ikpoba-Okha, in Nigeria, despite the advancement in technology, a lot of the SMEs and medium size oil businesses (contemporary) farmers in Ologbo use some form of modern ways in their palm oil extraction processes but there is not enough document or articles with regards to the types of machinery some of these SME’s and medium farmers use as it shows on record that 80% of palm oil extraction in the local area still use the traditional extraction processing, (Yulianti et al., 2018).

Also (Ebhuoma, 2020) said that more than half of contemporary farmers in Ologbo Ikpoba-Okha incorporate some form of traditional practices in their palm oil extraction processes.

There is limited research on how palm oil extraction affects the eco-system of African rain forest, (Owolabi, 2018).

Deforestation is one of the greatest threats to sustainability of palm oil farming in Nigeria but despite this fact, there is little research on this cause, (Ior et al., 2017)

Conclusion

Based on the articles reviewed in the literature section, two conclusions can be drawn;

Firstly, it can be concluded that a critical evaluation has been conducted on most of the articles used in the research and this has led to the identification of the historical and current gap in the literature, as a result potential area for future study has been highlighted for further research such

as indigenous knowledge management of palm oil extraction looking at its impact on the rainforest of Ologbo in Ikpoba Okha area of Edo state Nigeria.

Secondly, to replicate the Nigeria palm oil boom prior to 1960's when traditional methods was used for palm oil farming and extraction which then was sustainable, if these sustainable ways are adopted in the present these measures can bring about international expansion of the palm oil business in Ologbo Ikpoba-Okha Edo state and Nigeria in general.

2.3: Research Background

According to (Jellason et al., 2021) Nigeria palm oil extraction history date back to the 1930's to early 1960's but there is limited documentation to this effect. Nigeria's indigenous knowledge management practices have long historical origins, although they are not usually reported as in many other African countries (Chiwanza et al., 2013). This research discussed the history of indigenous palm oil extraction practices in Ologbo Ikpoba-Okha in Edo State Nigeria and it helped the researcher to provide information about social events that are widely believed to be lost, the processes involved in this research took into account the environmentally friendly methods of palm oil extraction in the past, which are indispensable for further development of current daily extraction practices. Every country in Africa has its own indigenous practices and beliefs that have been adopted around through words of mouth since ancient times (Colnar and Dimovski, 2017). To this day, anthropologists and historians are trying to understand how the pyramids of ancient Egypt were built and the ongoing discovery of better-preserved tombs in ancient Egypt. Given the way the ancient Egyptians (Africans) lived and how they can explore their indigenous knowledge of sheltering the dead and the work of the pyramids, their graves are wonders for anthropologists and history students, (Chendov, 2018).

Starting from traditional domestic practices, several studies have been carried out on indigenous knowledge management practices on various topics. (Cerchione and Esposito, 2017), Traditional Indigenous Knowledge and Science, and (Centobelli et al., 2017) wrote on the Colonial Office and Nigeria's Petroleum Exploration also (Bubou and Amadi-Echendu, 2018), did research on Nigeria's oil concessions and land purchases to mention only a few, but none of them, assessed from the historical perspective the indigenous knowledge management practices of palm oil extraction. This research focused on the historical perspective of indigenous knowledge management practices that can be traced back to the early days with the ultimate goal of enhancing the models and practices that can be used to improve current palm oil extraction practices.

Knowledge management involves effectively gathering, hiding, and using information, and it is usually said to focus on the ability to associate and store information, (Bryman Bell, 2015). The term knowledge management was first used by Peter Drucker in the mid-1990s. Nonetheless, indigenous knowledge practices have been around for a long time and are passed on from one era to another through word of mouth (Sifuna, 2008).

2.4: The Nigeria Economy

Figure 1: Map of Nigeria

(Administrative Map of Nigeria Shown here)

Nigeria gained independence in 1960 and soon after 1966 got into political turmoil. Between 1966 and 1979 a system of overthrow, opposition, change of power, instability and communal conflict was introduced. The Nigeria military used coercive measures and organisational frameworks that are not conducive to currency development and progress in Nigeria. The desire to remain in power under the military positions has resulted in constant changes in the government that have put all of Nigeria's intentions and economy in trouble. The relentless power imbalance became a real obstacle to the implementation of some well-intentioned plans, so that the then very money-intensive projects were stopped, partially rejected or completely ignored by different governments. This situation illustrates, amongst other things, the financial waste that led to political weakness in Nigeria, (Chendov, 2018).

The need for previous Nigeria government to reduce the external (international) benefits from foreign governments resulted in frustrating financial developments in Nigeria, during this time, the oil explosion brought huge revenues for Nigeria government from crude oil sales, (Cerchione

and Esposito, 2017). as a result of crude oil sale increase, Nigeria government started collecting debts from world bank regardless of its crude oil revenue, (Centobelli et al., 2017).

The combination of state luxuries and other wrong arrangements made by Nigeria government made the political elite in Nigeria to hold on to power despite misappropriation. The failure of the national mission quickly became a major bottleneck for economic development and progress, and led to widespread financial stagnation. This situation has created serious tension in public institutions at home and abroad that have tried to stimulate development and progress through tax reforms (Bubou and Amadi-Echendu, 2018). The government's basic response to currency stagnation has been to formulate various adjustment measures as reflected in the Economic Stability Act of 1982, measures and controls are already inadequate and counterproductive, reducing the pace of development (GDP) and limiting use. In 1985, more stringent financial, currency-related measures, as well as trade controls and wage strategies, were developed to accommodate the growing monetary environment (Braun et al., 2017).

2.5: The Impact Palm Oil Plays in Nigeria Economy

According to the Central bank of Nigeria (12th February 2020), if Nigeria had maintained its market dominance in the palm oil industry of the 50s and 60s, today it would have been earning approximately about $20 billion annually from its sale of palm oil (Mojeed et al., 2020), Nigeria neglected its push for global pecking order when it comes to palm oil extraction that would have helped Nigeria economy.

It is also believed that Nigeria is one of the countries in recent years developing the fastest when it comes to palm oil farming in recent years, (Lwoga et al., 2020),

Nigeria was a major exporter of palm oil in the 50's and 60's prior to its palm oil ban (Boyer, 2016), palm oil is arguably one of the most profitable businesses in the world, for the main supplier countries, palm oil can make an important contribution to the public economy, encourage countries to swift currency developments and alleviate poverty (Ammourah and Pitchay, 2020). Palm oil was developed by large organisations and ranchers in the early 60's in Nigeria (Ammourah and Pitchay, 2020), several studies have shown the influence of oil palm development and spread to various elements of currency development and human government support (Armat et al., 2018). For some tropical countries, palm oil is a major proponent of total public goods and unknown trade profits. In 2018, the total global palm oil trade reached $ 30 billion, of which Nigeria and Malaysia were the largest exporters (Archer-Brown and Kietzmann, 2018).

In most of the recent oil palm expansion, ranchers have moved from producing grain or other sources of income to developing oil palm (Ammourah and Pitchay, 2020). Elsewhere, wasteland or forest has been turned into palm oil plantations, which has a negative impact on the environment. Several studies in different countries have shown that the development of palm oil has made an important contribution to the financial development of the country's situation (Ebhuoma, 2020).

The general conclusion is that the development of palm oil has brought huge profits to palm oil farmers, workers and others in the supply chain including middlemen, middle class people and a limited number of youths into the business (Archer-Brown and Kietzmann, 2018). Palm oil Family businesses and networks benefit from higher ranch payments, new jobs, and provincial

work. According to (Lwoga et al., 2020) not all palm oil small businesses benefitted from the booming palm oil businesses in the past (Bubou and Amadi-Echendu, 2018).

Palm oil extraction practices usually involves very serious work (Braun et al., 2017), in Nigeria, palm oil complements farm labor in large ranches and small ranches and provides financial benefits to some landless workers (Lwoga et al., 2020). Due to high unemployment rate in Nigeria, a lot of Nigerians are turning to farming to survive and a lot of Nigeria youths have gone into palm oil farming (Ebhuoma, 2020).

In Nigeria, palm oil work is an important source of income for some rural households in comparison to other agricultural subsectors (Lwoga et al., 2020), palm oil work is an ideal job for some. Studies in Nigeria and Cameroon have shown that growing interest in palm oil has enabled a limited number of business visionaries, including poor rural women, to start their own palm oil businesses to generate incomes for their households (Archer-Brown and Kietzmann, 2018).

According to (Ebhuoma, 2020) a study in Nigeria found that although small factories jobs helped the rural communities in Nigeria, many young people are still choosing and moving into the oil palm jobs and businesses because of incentives it generates. In Mexico and Guatemala, rural families have benefited from new jobs in palm oil fields and increased wages (Mojeed et al., 2020), however, despite higher living wages, government support for food security and other income measures is very limited in Nigeria, the palm oil labor has not progressed as it continues to rely on other food supplies, food market efficiency.

Archer-Brown and Kietzmann (2018), a comprehensive financial reform is believed in some quarters to be the only viable option that could prevent complete economic collapse in Nigeria.

This mindset led the International Monetary Fund and the World Bank to create the Major Adjustment Program (SAP), which delivered results in 1986 and ushered in the era of financial social transformation to create a more favorable environment and improvement for the development of the currency, the various changes and methods introduced since 1985 have made major contributions to improving the economy (Mojeed et al., 2020) Nigeria is currently the second largest economy in Africa, it has a large and practical capital market, and its population is also growing rapidly. As a provincial power, the Nigerian economy accounts for around 55% of West African GDP and 64% of GDP, depending on the Equal Purchasing Power (PPP) rating of the country's 13 regions in the ECOWAS division (Armat et al., 2018).

2.6: History of Palm Oil Extraction in Nigeria

Palm oil is an important and moderate source of oil for manufacturers of detergents, biofuels, edible oils, vegetable ghee, shortening, margarine, frozen yogurt, batter, cream, coatings, and other types of salty fats, also palm cookies come from the core and are used to make food for living things (Ebhuoma, 2020). The market for palm oil is very large, about 80% of all the delicious vegetable oils consumed in Nigeria are made from refined palm oil (Lwoga et al., 2020). There are many ways to remove oil from palm brunch seeds **(See appendix 7**), but the traditional method is to heat palm seeds in a dry drum or pan and then pound in a mortar, the oil removed in this way is dark brown and is widely used in traditional medicine and cooking with oil (Bubou and Amadi-Echendu, 2018).

Palm seeds oil is also removed by squeezing to produce a pale yellow to transparent oil. Mechanical extraction measures are used by contemporary palm oil farmers and large border

large palm oil companies (Ammourah and Pitchay, 2020). There are three major mechanical palm oil extraction process, systematic process, core pretreatment, screw extrusion, and oil sizing, in general, fancy separators are used to remove metal fragments whilst vibrating sieves are used to sift sand, stones or other unfortunate things that can enter the machines during harvesting (Ebhuoma, 2020). Screw pressing is another palm oil extracting process in which properly prepared natural palm products are processed in a screw press to remove oil and pastries from palm kernels, the oil from the press is sifted and separated to remove heavy impurities in it so that the previous oil becomes clear (Chiwanza et al., 2013).

Traditional Palm oil extraction

(Image: Traditional Palm oil extraction Method of Extraction Shown here)

Traditional Palm Oil Extraction Method

Ayodele and Eshalomi (2010) argued that Nigeria is an important part of global palm oil producer. Since the creation and refining of palm oil, the methods of crude oil exploration have typically drawn the attention of governments. Crude oil has been a real monetary asset throughout Nigeria's history and a supporter of Nigeria GDP. This has resulted in a significant decline in the production of palm oil and other secondary oil palms (Chiwanza et al., 2013). The economies of the people who depend on it are also affected. In addition, the lack of proper management by indigenous palm oil farmers is affecting their incomes and income opportunities of processors. According to (Lwoga et al., 2020), in palm oil processing, the delivery amount of palm oil depends on the quantity of palm harvested, work efficiency and innovation method, which is normal, in either case, given the need to segregate farms according to the species processed (hybridisation and the best locally made combination), developing a model to

understand the real relationship between production and contribution to palm oil would be problematic to wildlife. Research effectiveness on palm oil extraction is based on the quality of teaching, skills and age and these are constantly changing and the processing of palm oil innovations (Cerchione and Esposito, 2017).

History of Edo State

Map of Edo State (showing Ologbo in Ikpoba-Okha local government)

Fig: 2 Map of Edo State Showing Ologbo

MAP OF EDO STATE SHOWN HERE

Edo State of Nigeria is in Southern Nigeria. The northeast and east are bounded by the state of Kogi, to the east by Anambra, to the southeast and south by delta state, to the west and northwest by Ondo; the Niger River flows through the state's eastern border. Benin City is the state capital of Edo State and the largest urban community (Akpotor, 2019). The state of Edo was delimited from the northern part of the state of Bendel in 1991, and the southern part became delta state. Previously, in 1963, the residents of the area voted for self-isolation based on what was then the western region, whilst the central and western regions were created at the same time (Akpotor, 2019). This state became the Midwestern States after the federal reorganization in 1967; from its second renovation in 1976 until the split in 1991 it was called Bendel State. Edo is between 500 feet (150 m) in the south and over 1,800 feet (550 m) in the north. The equatorial jungle covers most of the area. The state is mainly occupied by the Edo (Bini) who are associated with the precious Kingdom of Benin (Ahmed et al., 2017).

Agriculture is the backbone of the economy. Sweet potatoes, cassava (cassava), oil palm, rice, and maize (maize) are important crops, whilst elasticity, wood, palm oil, and grain are economic crops. The mineral resources include limestone and Granite. The organisation of the main roads of the state and the airport in Benin are related to transportation. There is the Nigeria Oil Palm Research Institute, the Nigeria Rubber Research Institute and the University of Benin which is a federal university (founded in 1970) are located in Benin City, whilst the state University (founded in 1981) is located in Ekpoma. (Acey, 2016).

The main first languages spoken in the state are Edo, Etsako, Esan, Owan, Akoko Edo, Okpameri and Ijaw.

2.7: Importance of Knowledge Management

Knowledge management is a conscious process of characterizing, organizing, binding and conveying the knowledge and experience of employees in an organisation (Hill et al., 2020). The main goal of knowledge management is to increase the productivity of an organisation and to store knowledge in the organisation (Bubou and Amadi-Echendu, 2018). KM often mentions preparation and learning in an organisation or with their clients. KM consists of a model for creating, sharing, organizing and testing knowledge to improve the effectiveness of the organisation's collective knowledge collection (Hill et al., 2020), the goal of KM is to strengthen learning and create a learning culture that supports knowledge sharing, and individuals trying to figure out how to do their jobs will feel better and have no difficulty with it. In knowledge management, it makes sense to take into account the type of knowledge and the transfer of this knowledge within the organisation (Hill et al., 2020).

Knowledge management ensures that certain knowledge is not forgotten by employees or is not used by different employees who can benefit from this knowledge, it assumes a better understanding of the situation and opens the door to understanding prescribed procedures, learning exercises and an overall improvement in level (Cerchione and Esposito, 2017). Knowledge management is important because it helps to understand the organisation's ability to make decisions, to ensure that all employees within the organisation can acquire common skills, also that the organisation has put together a more insightful workforce that can make quick, informed decisions that benefit the organisation. It is easier to move forward within the organisation, which diminishes the customer benefit of extensive access to best practices and representative traffic. The importance of knowledge management increases from year to year (Chendov, 2018).

Knowledge Management according to (Hill et al., 2020) helps to create an Improve Smoother Workflows and Decision-Making in an organisation.
With a good knowledge database, employees can have instant access to the content they need, in this sense, they can immediately release the necessary information at the workplace and carry out their tasks more effectively (Chendov, 2018). Employees will no longer have managers intervening constantly in their working processes or seek help from their boss or colleague, in this way, employees can acquire knowledge.

The proper use of KM in a palm oil extracting business can enhance effective learning atmosphere for the business and employees and especially knowledge sharing, can lead to better learning outcomes (Centobelli et al., 2017), this is based on the fact that knowledge comes from

the real experience of the employees, it is presented in a very sober and simple manner, giving employees the opportunity to apply what they have learned immediately if necessary, after that, they would have learnt new information faster (Chendov, 2018).

It is often said that "two heads are better than one" if an organisation such as the (indigenous and contemporary businesses) palm oil extracting businesses in Ologbo Ikpoba-Okha can provide effective phase of knowledge sharing, it can harness the collaborative energy that exists between employees and the business (Centobelli et al., 2017) and this can stimulate a more innovative, cooperative and open working atmosphere and creates a more complex center for cooperation and mutual help.

According to (Bubou and Amadi-Echendu, 2018), by acquiring knowledge as part of knowledge management, an organisation can ensure that future employees have access to comparable data, regardless of whether the employee leaves the company or the office this is especially important in high-traffic areas, such as at work and helping customers.

Businesses today can benefit from knowledge management based on knowledge exchange, because knowledge begins with real employees who work on the economic side of the organisation and has significantly more connections to the real economic conditions of the organisation (Hill et al., 2020) this will reduce the pressure on the organisation and development training teams in the organisation and allows them to play other more prominent role in the organization (Centobelli et al., 2017).

Knowledge sharing and knowledge management will result in the workforce of that organisation to become more efficient and better educated, it is a tool that can help any organisation in today's business world. An efficient KM data system will help teaching methods for employees (Hill et

al., 2020) and this can help both the contemporary and indigenous employees to develop their extraction practices.

Although Knowledge management is very good, the use of KM systems can be very tedious in an organisation it can lead to too much dependence on knowledge providers which can cause confusion between managers and employees and can also lead to misuse of important information about the organisation (Hill et al., 2020).

2.8: Types of Knowledge

Tacit Knowledge

Tacit knowledge encompasses everything that a person knows how to do, in fact how a person cannot interpret it at all, or there is no need to attempt to record it. It is often characterized as skills, thoughts, and encounters that a person possesses but cannot be documented and easily grasped (Hill et al., 2020). With tacit knowledge, individuals do not regularly understand their knowledge or the meaning of knowledge to others. This knowledge is not always passed on as it may not be relevant to your current work (Chiwanza et al., 2013). Tacit knowledge includes the tendency and practice acquired through time and experience; tacit knowledge is the best undiscovered asset in an organization. It accounts for 80% of all knowledge in an organization, compared to 67% in 1994 (Thompson et al., 2020). In the workplace, tacit knowledge is an explicit application competence of a company. These can be the skills expected to complete the transaction or just researching the client's needs. These characteristics are the result of clear experiences within an organisation and are in no way simply passed on to other people in the team (Cerchione and Esposito, 2017).

The moment experienced employees leave, they take a wealth of business knowledge with them. Due to the loss of tacit knowledge, the cost of replacing them for an organization is 212% of the annual fee for experienced staffs (Cerchione and Esposito, 2017).

Undocumented knowledge is the foundation for establishing business compliance and life expectancy. Organizations often strive to pass the test of reaching and utilizing this wealth of knowledge through frameworks such as intranets that can only use archived knowledge. The knowledge framework of the report also represents the exchange of knowledge among experts, whose opportunities to regularly carry out additional tasks are negligible (Cerchione and Esposito, 2017). Another obstacle to these frameworks is the warehouse formula, while explicit knowledge isn't difficult to come by, tacit knowledge is usually stored in the minds of teams or experts. Unlike other types of knowledge, you cannot simply send manuals to individual team members or have them view online courses for tacit knowledge. Various attempts to capture and disseminate tacit knowledge include coaching projects and individual course sessions.

While this overdevelopment is a valuable form of knowledge exchange, it can only be achieved through these static and non-scalable strategies.

By gathering tacit knowledge, companies can identify experts, ask questions, find quick solutions, and access the most important and advanced data at any time (Chiwanza et al., 2013).

Implicit Knowledge

Implicit knowledge is the judicious use of explicit knowledge (Thompson et al., 2020), opportunities for tacit knowledge are possible in an organisation, for example, imagine asking how part of a team is doing a task. This can start by discussing the scope of alternative work, such as possible outcomes that will lead to an insightful cycle of decision-making about the best

game plan. The tacit knowledge of the team suggests discussing how to achieve something and what could happen, in addition, best practices and skills that can be transferred from one occupation to another are examples of tacit knowledge. Implicit knowledge is essentially determined by skills or specialist knowledge, it is obtained by acquiring explicit knowledge and applying it to specific situations (Chiwanza et al., 2013). As for the expressive knowledge of books on flight mechanics and aircraft cockpit layouts, implicit knowledge is what happens when you apply the data to the flight of an aircraft.

Implicit knowledge is the knowledge that you acquire when you acquire knowledge in the most ideal way, you can then use this experience and combine it with other learning data to solve a completely new problem (Hill et al., 2020). Typically, new hires encounter large amount of tacit knowledge that is stored in an undocumented loop, the same goes for friend tutorials, such as coloring and pair programming, capturing and moving tacit knowledge is usually the space for learning and development team.

Implicit knowledge is usually avoided in a formal knowledge base because it is difficult to report and record in a common way (Thompson et al., 2020), as employees put more energy into an organisation, they encourage the adoption of specific business practices.
According to (Chiwanza et al., 2013), Since there is no regular reporting, tacit knowledge is managed more carefully from an organisation point of view if you do not know how to get information about the cycle, do not report that information anywhere in the knowledge management framework. These variables make imparting tacit knowledge even more complicated at the end of time, all tacit knowledge is gone. Whether or not you entrust an

important cycle to a representative, that experience will not be passed on to the other members of the team if you use implicit data, you may miss out on important achievements and performance improvements.

2.9: Indigenous Knowledge Management Systems Types and Applications

There are different types of IK, according to (Thompson et al., 2020), Indigenous knowledge (IK) is defined as the knowledge that is passed on from generation to generation, a comprehensive collection of information that has been created and elaborated over a long period of time and relates to centuries of innovative ideas and activities within unique social orders in a cohesive home biological system, with the ultimate goal of adapting to the agricultural, natural and financial environment of change as defined by the indigenous people and native information.

While, (Ajibade and Eche, 2017), used terminologies such as “community”, “neighborhood”, “local region” and “farmer information” to describe indigenous Knowledge, the information and talents imparted by people in relation to a particular geographic location, enabling them to benefit from their ecosystem, their native knowledge and skills is seen as IK, (Ajibade and Eche, 2017) As a result, such information and talent are passed on from generation to generation, and each new generation adds something and adapts to changing environmental conditions. With this in mind, it is suggested that the core framework of knowledge management is fluid and does not really work in formal organisations, although it clearly exists within certain ecological boundaries (Sithole, 2020).

Justification For Thompson et al., 2020 Definition

The researcher prefers the definition of (Thompson et al., 2020), because although there is limited written down information on Indigenous Knowledge, Indigenous Knowledge has been in existence since the existence of man on earth (Hill et al., 2020), also indigenous Knowledge has helped people in different parts of the world for centuries on how, they live, their agricultural practices, financial practices, taking care of their environment, treatment and protecting themselves against diseases in their communities (Rayne et al., 2020), and the different aspects covered by different authors of indigenous knowledge is covered in this one definition of (Thompson et al., 2020).

Even though Indigenous Knowledge has been in existence for centuries (Thompson et al., 2020) Indigenous Management systems (IKM) are new to a lot of people and indigenous community businesses, although it is dynamic and important in the development of storing and sharing indigenous practices and processes of information's that can be lost over time, (Sithole, 2020) IKM systems are daily undergoing meaningful experiments; and it's inexpensive, but due to the fear of losing some basic properties in translation to code them in a meaningful way the progress is slow (Sithole, 2020).

Indigenous Knowledge differs from western logical or modern knowledge that could otherwise be generated by research institutes and schools (Hill et al., 2020). Indigenous Knowledge Management (IKM) is characterised by the fact that the main element is to listen to the discussions or information of practices and procedures of indigenous people that cannot be substantiated by written scientific evidence other than words of mouth(Ebhuoma, 2020), such an unregistered check is practically impossible in practice, however that is how indigenous

knowledge management (IKM) are created and its framework are not limited to agricultural countries, although they are more prevalent in non-industrialised countries.

This research emphasized the use of indigenous knowledge management (IKM) practices in palm oil development in the Ikpoba Okha Local Government Area, of Edo State. (Sillitoe, 2020).

There are several substructures or sources from which IK can be inspired, practices among the Xai Xai and Sankuyo people groups in Botswana, for example, according to (Agyemang et al., 2019), information's were passed on orally from generation to generation in the form of restrictions, symbols, standard laws, beliefs, natural moral concepts and values. The following section provides examples of some of these IK (Indigenous Knowledge) sub-types from various traditional networks (Sharief et al., 2021).

Beliefs

Traditional Indian beliefs may be reflected in local beliefs based on their religion or possible culture, for example genealogical love and the belief that ancestors are intermediaries between the local community and God, if not full-fledged divine beings. Many groups of people realise that the forerunners can communicate with man, for example, the creature (animal) is no longer killed at a wedding reception or in a slaughterhouse, but in the courtyard (Radcliffe et al., 2021). During this contact the of the house turns to his children to prepare a stable marriage and organisation. Even living beings such as goats, sheep and cows (go phasa badimo) are killed in various African ethnic groups as a kind of "cleansing" when the existence of a person or community does not go as expected and sought (Parsons et al., 2019).

Indigenous Knowledge in Medicine

Spices extracted from nature are an important source of traditional African medicine in the region. Herbs, both general and specific, are used to treat a wide variety of conditions. For example, the yellow star, also known as the African potato (leraka), is considered a useful tuber for building a hard structure and treating high blood pressure (Mahwasane, 2017). The aloe plant (Sekgokgopha) is used to cleanse the body of toxins and free revolutionary prisoners, spices are used as a primary or essential drug treatment and are also available on rural networks and poor urban cities. Conventional healers are increasingly testing their skills in public health systems. Afolayan's presentation at the Indigenous Knowledge Systems Meeting at Venda University in 2001 focused on Afolayana's own phytomedical research in the Eastern Cape (Magni, 2017), he pointed out that some clinical guidelines that include phytomedicine have negative views on conventional healers. Spices are used not only as traditional medicine to treat disease, but also as a form of defense against disease, for example, in the case of several African ethnic groups, the bark of a particular tree is harvested and bitten in order to brush their teeth and prevent dental problems. The San of the Kalahari Desert (Hoodia) have long relied on the thorny hoodia plants to prevent hunger pangs during the hunt, which can last for days (Lwoga et al., 2020).

Human Resources and Indigenous Knowledge

In many African groups, human relationships determine who should play an important role in local development and leadership. Traditionally, groups of people worked under the leadership of a leader or mayor. Church leaders organised or had the opportunity to distribute property in the local community to help those who could not cope (Kurnio et al., 2021). It can help explain the rarity or complete absence of desperate, wandering people in various traditional societies, as well as the reasons for their absence, assuming a person is noticed on critical waterways, but not only because of drowsiness or lack of energy, then the village chief invites Letsema to an

examination. Strong and healthy people in the community would be known to build homes for others who could not do it themselves (Chepchirchir and Kwanya, 2019). The local regional chief or senior official has authority over physical property, but is also responsible for ownership of relevant information available in the area, in this way, the individual is ready to meet people with special strengths. Conventional pioneers were able to make final decisions on important issues, today the situation is unusual, a government-based popularity where interaction with partners has become the norm (Chepchirchir et al., 2019).

Transfer of Indigenous Knowledge Technology

People in their current situation, especially those who live in traditional social hierarchies societies, have the potential to make extraordinary financial arrangements, for example, cow dung is used to decorate partitions and floors in some traditional lattice houses (Bhushan and Mani, 2021), it is also used to close the pot lids to keep the pan at the same temperature as the bread is heated, in short, the process of mining coal requires a very complex ingenuity from the beginning, regional coal producers used fresh logs of certain types instead of dry wood to produce their coal they collect new logs and cover them with soil, leaving small spaces between each log to allow oxygen to penetrate the “heat” and slowly destroy the wood (Bhushan et al., 2018), although the cycle lasts for several days, it results in slow ignition to produce carbon rather than completely burning the logs (Bayat et al., 2018a, 2018b).

Indigenous Knowledge in the Education Process

Primary schools were and will remain places of practice and are of traditional teaching techniques (Ben et al., 2017), individuals in the environment, especially the younger generation, learn about their customs (Ban et al., 2017). Different religious beliefs and the need to respect yourself, but also others, especially older people are taught in primary schools, by seeing the

behaviour and occasional for examples signs of climate change, young people learn about climate readiness and human existence. The gathering of information is constantly being collected and archived to be passed on to future generations (Ajayi and Mafongoya, 2017). In some cultures, for example, young children are warned against visiting the kraal, the lesak, as it would become sterile. While the logical validity of this concept is difficult to prove, it fulfills another need, namely the desire for security. One of the main reasons females are “barred” from entering an enclosure is that animal protection is usually well established, especially from robbery and other criminal activities (Mahwasane, 2017).

Communication of Indigenous Knowledge

Social events are planned and should inspire, educate through dance, music and entertainment. It was and remains that way. After lunch, the elders told stories and give advice based on the traditions of a particular ethnic group, as was the custom in many families (Kayode and Otoide, 2021). The “language” used in IK correspondence is unique and does not correspond to the common language in other region.

Indigenous Knowledge in Farming Practices

Breeding and rearing techniques are the two main areas that IK is extremely rich in (Kayode et al., 2020). Logically, too, there have been cases of adjacent soil groups and natural formulations that have been researched, tested and proven to be effective. The locals tend to their crops, which is the custom of growing different crops in the same field, examples of cut plants are flour (corn or maize), mabella, and beans, which are used to store nutrients in the soil. When a piece of land is dormant for one or more seasons, the ground is covered with debris to prevent it from being attacked by unwanted snails (Fombad, 2018).

Food Technology and Fermentation Techniques

Several food storage and capacity building structures have been developed and have been used successfully in traditional social systems. Mopani worms (ifishimu), for example, are a fantastic source of protein that can be found in abundance (Ebhuoma and Leonard, 2020). They are popular in South Africa, but are also eaten in many parts of East, Central, and South Africa. They often appear at specific times of the year and are harvested the same way at those specific times of the year, either way, they can be kept for a long time by simply boiling them in water, which can also be salted and sun-dried. The comparative (morogo) method is used to protect African spinach, the use of IK in beer brewing is also becoming increasingly popular with traditional chains (Dneprovskaya et al., 2018). Overall, indigenous knowledge (IK) in the field of food preparation and preservation has reached an extremely high level in many different parts of the world.

Arts and Craft

Wood, mud, beads, textures, dirt, and various other materials are used to make improved and useful structures, the technological improvements and tactics implemented in the local community are usually remarkable and sophisticated (Christy et al., 2021), for example, some floors can only be found and sold in certain geographic areas. Soil and soil mixes along with cow dung are used to improve partitions and floors in traditional mud houses, particularly in Ndebel, Northern Cape, South Africa and Zimbabwe, it makes a creative and bright impression on the viewer. Different types of soil are used for the production of special types of pots, each of which is unique (Chepchirchir et al., 2019). Improved ships can potentially deliver unique messages while demonstrating the ship's specialty, for example, Zulu has great types of pots made and lit specifically for brewing and storing beer. An important feature of IK is that it is essentially unspoken information that makes it difficult to understand. The IK generally looks like this:

- not registered or registered
- is considered random and unprofessional
- cannot be coded correctly
- Always easy to reach
- influenced by listening to other people's discussions

In addition to the characteristics mentioned above, the degree of IK is often associated with chronological age, compared to young people, older people have a wide variety of forms and levels of knowledge (Afanasev et al., 2018), it is shown that the traditional power family relationships affect the amount of IK that an individual can access and, in some cases, manage networks and their members have many different types of information that may not be available to everyone. To ensure that locally stored knowledge is sustainable and used for the benefit of all, it needs to be shared by all parts of the community (Adekannbi, 2018). In traditional networks, the exchange of information is coordinated and controlled by the local authorities at the top of the hierarchy.

There are many different forms of IK that have been successfully developed, communicated and practiced for a variety of purposes (Adedeji et al., 2018), as mentioned above, Indigenous Knowledge (IK) is as important as possible when it comes to providing unique solutions to situations of a near and unexpected nature. It is disappointing to find that some of this information is disappearing without our knowledge or has disappeared without a trace. Indigenous knowledge (IK) is at stake, as can be seen in the oral presentation, as is the presentation of new inventions. Core knowledge (IK) is threatened if it is not protected and is misused (Uzo et al., 2018). For example, some elements of IK are presented as groundbreaking ideas and then crossed boundaries without the recognition and reward of those who invented

them in science. It is where management knowledge comes into its own (Usoro and Abiagam, 2018).

2.1.0: Knowledge Management Process in Relation to Indigenous Practices.

Knowledge Management in relation to indigenous management aligns, according to (Hill et al., 2020) Indigenous Knowledge management is being able to manage the knowledge of the indigenous people and this focuses on its preservation of the Knowledge, sharing of the knowledge and utilization of the acquired Knowledge.

While Knowledge management process is the way in which a business manages its knowledge information, how it explains it to its employees, how the knowledge is stored, how the knowledge is shared to its employees and the Knowledge application or software systems it uses in storing and sharing the information (Ebhuoma, 2020)

Traditionally, indigenous knowledge is a special kind of knowledge that exists in itself and is created around certain individual states of indigenous peoples in a certain geographic area at a certain point in time (Chiwanza et al., 2013).

A group of people from a neighborhood that has a complex and highly creative framework of knowledge can also be described as having IK regardless of their responsibility to the knowledge framework (Ebhuoma, 2020).

For a long time, indigenous Knowledge have been formed on the basis of surrounding individuals who claim to have their own skills and ways of living their own traditional ways of life having their own knowledge to share, (Bubou and Amadi-Echendu, 2018). There had been organisations designed to help indigenous people by enabling them to reach agreement on more educated decisions that will affect their indigenous practices and future, although these

organisations are largely powerless and it's rare in Nigeria. If a sensible solution to the knowledge framework of IK is to be implemented, the integration of indigenous knowledge and other knowledge frameworks can improve the level of governance of Nigeria's indigenous organisations.

Knowledge Management process is generally seen as an important contribution to the controlled course of knowledgeable information (Hill et al., 2020), this knowledge management process is developed using a Knowledge framework which thrives through communication between people, as well as communication with nature internally and externally (Ebhuoma, 2020), for hundreds of years, indigenous people have learned and perfected how to develop and preserve food, they taught and imparted knowledge about the range of plant yields, when to plant and weed, which plants are poisonous, which can be used as medicine, how to treat infections and at the same time deal effectively with the current situation, managing this information requires Knowledge management process, Indigenous knowledge has historically been suppressed or neglected or at best rejected by standard Western science (Ebhuoma 2020).

The scientific community is increasingly considering indigenous knowledge and improvement and have not yet promoted consensus on indigenous knowledge ideas, very little research has been done on the management of indigenous knowledge in a lot of fields of information. Ngulube (2002) and Muswazi (2001) are part of a series of researchers who have done studies in the field of IK library and information (Bubou and Amadi-Echendu, 2018). Indigenous knowledge is unique for a particular culture and society, it is the knowledge that the community possesses and the encounters that have been created by those living in the community or network

over a long period of time and that are usually transmitted orally from one people to another (Bryman, 2015). IK is used in many fields such as agriculture, welfare, education, family management, etc.

In 1987, IK was officially recognized as valuable for sustainable development for the first time at a conference entitled “Our Common Future” in Rio. In addition, current indigenous knowledge is most effectively used as a source for creative arrangements as it is viewed as very close and long term (Braun et al., 2017). Indigenous knowledge (IK) has been disseminated orally for centuries, sometimes in the form of all kinds of documentation (Ebhuoma, 2020). It’s not really good that the whole library disappears when a highly educated or elderly person dies, which shows the magnitude and importance of local knowledge of more experienced people, this supports the urgently needed sensitisation and the full interest of all people in the world to archive their personal indigenous knowledge as their inheritance so as not to lose it. It has been observed that 80% of the total population rely on local knowledge to meet their treatment needs, and in fact half of their food supplies depend on local knowledge, however, IK is still an untapped asset in the doctoral cycle (Chiwanza et al., 2013). Therefore, it is expected that unique efforts will be made to acquire, report and distribute IK to protect, move or receive and modify.

2.1.1: Conceptual Clarifications

In this context, indigenous knowledge management (IKM) refers to a system of social management of indigenous resources that includes the identification of indigenous resources as well as their collection, development, conservation, protection and dissemination (Ajibade and Eche, 2017) and

(Hill et al., 2020). Here are examples of resource knowledge manager's use: native language, normal progress, and conventional information.

1. **Indigenous Language:** This phrase mentions the technique of neighborly contact between people in the group or neighborhood. It contains the content of extensive facts and knowledge as well as the list of individuals or groups in a particular place. Indigenous Knowledge Intelligence (IKI) (Agyemang et al., 2019).
2. **Traditional Technologies:** It is the collective intellectual and perceptual experience of collaborative efforts that involve a group of people, their physical and natural surroundings, and the structures of their conception and development (Ademowo and Nuhu, 2017).
3. **Culture:** It applies to facts, beliefs, customs, stories, legends, fairy tales, rituals, songs, crafts and rights that are passed down from generation to generation (Adebayo et al., 2017).
4. **Traditional Knowledge:** They are the extensive information, ruse, customs and behaviour of certain indigenous people or neighboring networks that have existed for generations. In most cases, the usual knowledge of age has been passed down orally from one person to another, starting from one person to the next (Yulianti and Surendro, 2018). The material deserves attention in the context of a particular culture or society.

2.1.2: Conceptual Frameworks That Support KM

Lee and Choi (2003) Enabler Framework (Process and Organisational Framework)

For this research, the researcher used the Enabler framework. The Lee and Choi (2003) system shown in **Figure 1** and **Figure 2**, linked the interaction between knowledge management and knowledge by increasing the effect with the realisation of the link

(Hlongwane et al., 2021). The system covered four segments, empowerment, including data innovation, people, design and culture, but the system only introduced one segment of measures, namely a measure of information generation. KM amplifiers influence KM measurements, which in turn has a positive effect on the type of pairing.

Fig: 3, Enabler Framework Diagram

(Lee, Choi, 2003, Vol.,20. No1, pp179)

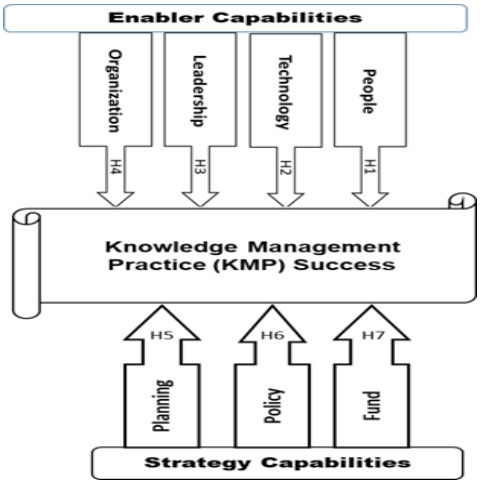
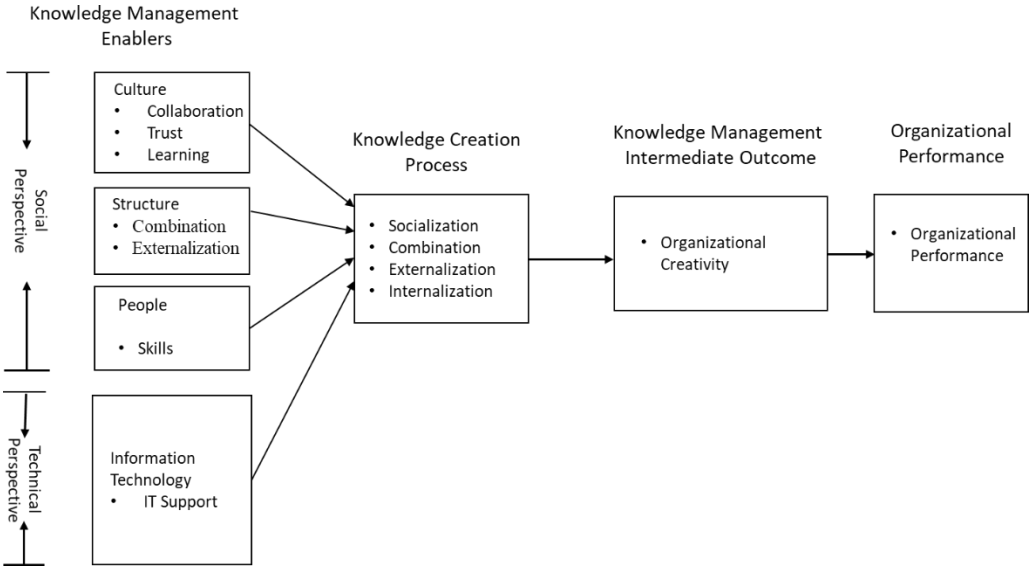


Figure 4: Adapted Enabler Framework

(Lee, Choi,2003, Vol.,20. No1.pp,179)



Justification for using the (Lee and Choi 2003) Enabler Framework

For this research, the Lee and Chow (2003), Enabler framework turned out to be very useful. Although this enabler framework was discovered through research, it became clear that the form of knowledge management effectiveness and firm performance will be of great importance in the search for looking at the practices of indigenous(traditional) and contemporary (SMEs, small and medium) size oil palm owners in Ologbo Ikpoba-Okha owners, the (lee and Choi, 2003). Enabler framework helped the researcher to give clarity on the different sectors of the organisations involved in this research (contemporary and indigenous businesses) to enable them develop the capacity of improving their business and learn how to develop effective working conditions to develop sustainability for their business, the researcher found out through research that smallholder farmers were using their position and power to overcome certain challenges. The concept of holistic business activity which is reflected in the (Lee and Choi 2003) 7 Enablers should be incorporated into future research on indigenous and contemporary palm oil farm owners as it is an excellent tool to achieve / sustainably improvement.

Breakdown Of the (Lee and Choi 2003) Enabler Framework.

Leadership

In line with experts and scientists when it comes to the Lee and Choi (2003) enabler framework, leadership plays an important role in the creation and management of information in an organisation; In this way, the relevant information objective is prioritized by the organisation and this is achieved through the practices implemented under the initiative (Abioye and Oluwaniyi, 2017). A study by Ogundiran (2019) show that for the inability of organisations to use information (Abioye and Oluwaniyi, 2017). A study by Ogundiran (2019) showed that for the inability of organisations to use information is a result of the lack of responsibility of the highest authority in disseminating relevant information, (Adedayo, 2020).

In addition to techniques, pioneers know how companies should manage and administer there information that is measured by management, by providing information in the framework program, a significant change in the organisation can be achieved, therefore the involvement of the initiative if considered important (Agri et al., 2018). The initiative of an organisation should aim to create an atmosphere conducive to the flow of information so that employees can trust that they can participate inside and outside the organisation and their responsibility as such is recognised. An organisation, also need to be willing to share and pass on their experiences to others in the organization, constantly adapting, and seeking new ideas and information when the opportunity presents itself (Bayat et al., 2018).

Ochieng et al., (2018) agreed that managers need to understand the value of information in order to play a critical role in the dynamic organisation environment in which they operate.

Ngulube and Ukwoma (2019), said organizations with significantly strong momentum initiatives will not succeed without attentive and caring leaders and (Chendow, 2018) said employees often find themselves in untenable situations when faced with information being used by managers, hence, organisations need to work with employees to address these challenges as they arise. Information that management in an organisation at all levels is primarily responsible for ensuring that information about management's objectives is consistent with the relevant processes and objectives they pursue in various ways (Bayat et al., 2018).

Organizational Culture

Working with information exchange, learning and information production requires an understanding of the organisation culture, values, beliefs, norms and images which are all part of the culture of the organisation (Chukwu et al., 2020). In general, organisation culture values information as it encourages development and promotes an open working environment for ideas to develop.

Improving work culture in an organisation is important for management activities and development in an organisation.

The long-term development of organisation culture occurs when workers adapt to the natural working environment of their organisation. Each organization has its own culture as well as unique and fascinating practices (Erinoso and Aworinde, 2018). A balanced culture of

information management consists of rules and procedures that facilitate the exchange of data between employees and across departmental boundaries, but also between managers themselves (Forutnani et al., 2018).

Building a culture of success in which individuals work in an organisation is a fundamental requirement for providing meaningful information in the organisation (Gyamfi, 2017).

Several studies have examined the causes of information that disappoints management and found that organisation culture is the main barrier to accessing information about management performance (Guiriba, 2019). Culturalism is a broad concept that covers a wide range of viewpoint, Collaboration is a perspective that is consider important in gathering information. According to (Mafongoy et al., 2020), Several studies have shown that collaboration is a key factor In knowledge Creation. According to (Lawal et al., 2020), the synergistic environment of an Organisation is one of the most important variables influencing the adequacy of the information Provided to organisation. Developing a robust and shared culture is essential to providing effective Information to the organisation (Forutnani, 2018). Another important part of the information in an organisation is trust, according to (Kankar et al., 2018) trust is the most important requirement for. knowledge transfer in an article by Jellason et al., (2021). Individuals will be skeptical of the intentions and actions of others due to a shared lack of trust and are therefore more likely to trust individuals and groups they share common goals and roles with this will make information

exchange cycle smoother, but a lack of trust will almost certainly, make the information exchange Volatile. The information provided will not be sufficient if there is no trust, without the trust of the people involved, it is impossible to develop new, useful, and satisfactory information.

Igwe et al. (2018) argued that organizations should ensure that their motives do not correspond to an authoritarian culture, In an emergency, the organization should take steps to facilitate collaboration. Gyamfi (2017) argued that effective information is the blackboard cannot be improved if the social, social and hierarchical structures do not change significantly.

KM Strategy

Gyamfi (2017) describes how the strategy used by an organization to adapt its information resources and capabilities to the objective requirements of the organisation system, he defined the information strategy as follows: the dissemination of unspoken information within the organization so that the right information is received at the right time and delivered to the right person in the right place. The information process determines the needs, implications and exercises necessary to achieve the goal, It is generally agreed in writing that the information that management must integrate into the business processes of the organization (Igwe et al., 2018). A prudent and transparent approach is seen as important in obtaining information on the organisation's objectives (Kankara et al., 2018). It is increasingly recognized that the ability of companies to gain an advantage depends on their ability to create, disseminate, and use information (Ogundiran, 2019).

If an appropriate approach is to be used to collect relevant information for management, there is one important factor to consider in effectively processing management information, this is a

method that makes it easier for companies to analyze and select the optimal information that management has access to. When identifying information, management technique, a key issue, includes both emotional and subjective assessment (Ochieng et al., 2018).

Information Technology

Innovation is a powerful information gathering tool that organisations can use to their advantage, everyone agrees that the basic panels of the information board are databases, intranets, information layers, and organizations, data technology is about finding data quickly, integrating and finding the right data (Jellason et al., 2021). Information technology is perhaps one of the most important factors influencing information for organisation performance (Nwafor et al., 2018). For example, information stored on an intranet can be implemented and integrated into the mechanical phase of an organization, working together as a data management framework. Business intelligence, databases, collaboration, content and archives, gateways, customer relationship management, information extraction and extraction, research and e-learning are some of data classifications (Guiriba, 2019).

According to Forutnani et al. (2018), data innovations consist of four different parts:

- Collect information's
- Define, achieve, classify, display and link digital units
- Find and identify similar substances
- Organise the material according to its numerous uses

Data innovation affects the motivation to share information through four different skills: breaking down barriers, providing ways to retrieve data, adequately measuring the flow of data, and exploring the realm of newsfeeds and information seekers. Proper use of data innovation can accelerate the flow of information through anything (Ngulube and Ukwoma, 2019). For example, if the organisation's employees are not well informed about the general goals and

objectives of the organisation and how this innovation can help them achieve those goals before the board publishes the information, the innovation company's revenues will be disappointing (Mali et al., 2018).

People

Employees who are committed to the success of the organisation, play a key role. according to (Abu et al., 2021), individuals are artists and workers, that's why it's so important to work with people who want to create and share their insights. Since information is made by humans, controlling it means monitoring it and controlling the data they produce (Igwe et al., 2018). When it comes to conveying information from one person to another in an organization, the most common method is crucial, the ability to share, use, and translate knowledge into relevant information with others is a fundamentally critical approach. The success of an organisation depends on its ability to assist individuals in transferring and sharing information with one another (Mali et al., 2018). According to Abu et al. (2021), organizations should see their employees as a valuable source of information and include management information in their representatives' management plan. The involvement of staff in the collection and sharing of information is essential (Guiriba, 2019), as a source of ingenuity, individuals are critical data for both management and the organization, to improve their operations, many companies will invest more in innovation than in people, if association representatives cannot apply this framework, this position is definitely not useful, hence, many successful companies are willing to invest in their people in order to generally improve their ambitions, skills and experience in the workplace (Forutnani et al., 2018).

Socialisation

Socialisation is a term used to describe unspoken collaboration between workers or people in an outside an organisation (Guiriba, 2019). Socialisation creates new information by combining the hidden with the unspeakable, and then that knowledge is shared between people in an organisation to create new information.

Externalisation

Implicit data can be converted into expressed data by using installed derived data to generate new concepts. Externalisation is how the organisation works with outside organisations (Igwe et al., 2018). The Nigeria Ministry of Agriculture generate data's which it shares with local farmers in the community (Igwe et al., 2018).

Combination

According to (Lee and Choi 2003) using their Enabler framework, organisations can create a model for their organisations by combining different components of the information they want to share and express.

Internalisation

This is the information that comes from previously reported materials within the organisation, it happens when compelling knowledge is gained by an organisation from internal information that is gathered and shared (Ifeanyi-obi et al., 2017) and (Ngulube and Ukwoma, 2019).

KM Intermediate Outcome

This reflects an organisation's outcome presentation and can leads to improved financial and non-financial performance, clear commitment, development, ideas, or significant innovation, to name a few (Bayat et al., 2018). According to one, school of thought intermediate outcome is the creation of a meaningful and valuable object by individuals working together in an organisation in a complex social context (Bayat et al., 2018).

Organisational Performance

The need for leadership knowledge is the basis for organisation success (Gyamfi, 2017), as a result of this, he concluded that effective management of highly efficient information that works is essential for improving authoritative performance. Promoting organisation performance requires other appropriate resources or explicit resources, but also effective information management (Abu et al., 2021). According to (Chukwu et al., 2020) “Individual information” becomes “aggregated information” hence, this information is called a power source.

Adedayo, (2020) There is general consensus that the task of sharing information based on a common, authoritative point of view is central to an organisation method and can therefore be described as a type of interaction called organisation learning through which the entire organisation is adequately informed. (Abu et al.,2021) have indicated that organisation learning has proven effective. The development of organisation learning is supported by many experts, including (Abioye and Oluwaniyi, 2017), they said that adequate learning improves business resources by combining the knowledge and experience of employees to better identify key strategic approaches, (Adedayo, 2020).

Knowledge Management Effectiveness and Firm Performance

As an organisation's public relations work becomes more important, the value of the information that can be obtained about the organisation will increase (Jellason et al., 2021). According to (Agri et al.,2018), the durability and seriousness of organisations depends on how well they communicate with their employees and customers. According to a study by (Bayat et al.,2018) societies today understand that in order to be successful, they must use information as a resource and manage it properly in order to be successful. It's important to remember that

management works with companies to improve their speed, efficiency, and creativity, because of its impact on business performance, managers' access to useful information is a key factor (Forutnani et al., 2018). Some organizations provide information to management to help them improve their execution strategies. Better use of the data generated by the organisation is important because of the organisation commitment to further improvement, better coordination of efforts, and better momentum, the information is important for final implementation (Abu et al., 2021). Information management is now recognized in most associations as a key element for business success.

Since information is a primary weapon that can lead to ever increasing utility, it is important to keep an eye on it., when accurate and meaningful information is modified, disseminated and integrated, organisations have an advantage (Ngulube and Ukwoma, 2019), as a result, successful organizations are those that create new knowledge, disseminate it within an organisation, and then quickly turn that information into new solutions and products (Bryman, 2015).

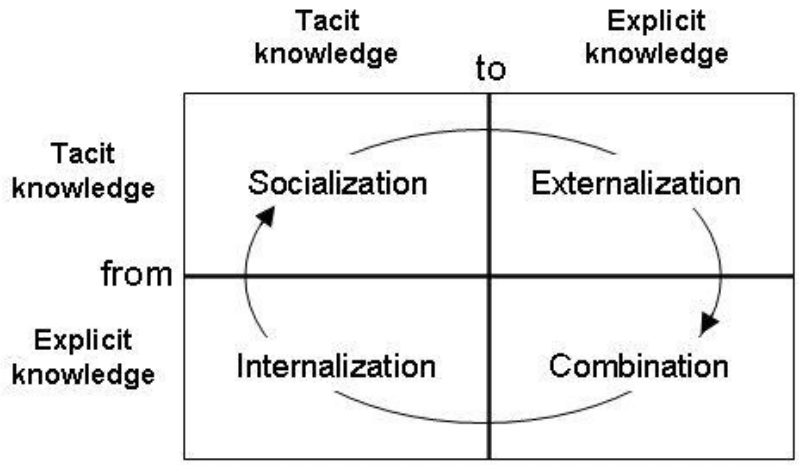
Nonaka Knowledge Conversion Conceptual Framework

The Nonaka Knowledge conversion framework states that when information changes, the Nonaka system focuses on creating new information, which is good (Christy et al., 2021). Associative information was examined twice in his framework (unspoken information and unambiguous information) and the logic of communication between these two types of information was constructed using a model. Second, associations can generate new ideas and thoughts through the collaboration of unique and closed information. There are four modes of

operation in the Nonake structure: socialisation, externalisation, internalisation, and combination, which serve as a path to learning (Christy et al., 2021).

Figure 5: Adapted from: Nonaka and Takeuchi KM Framework (1995)

(International Review of Management and Marketing, Vol 9, Issue 1. 2019)

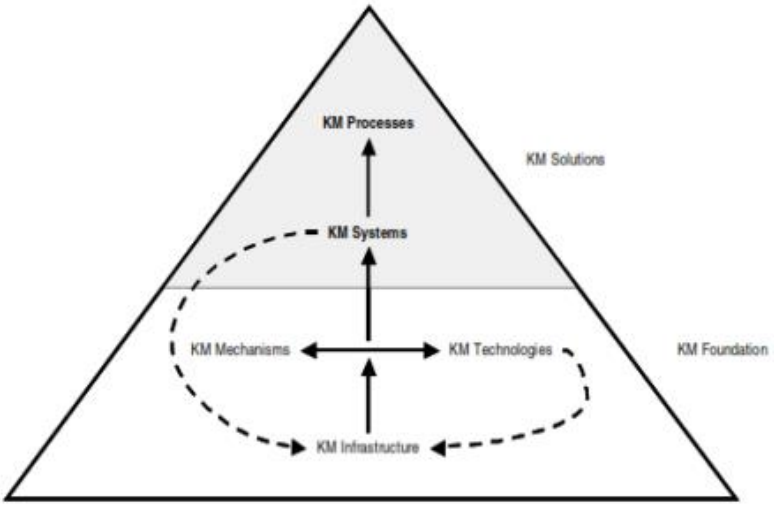


KM Solution and Foundation Framework

Ebhuoma (2020) saw the layout and the formation of KM solution foundation framework as a scoreboard information (Ifeanyi-obi et al., 2017) in two measurements. The KM control consists of two components, namely the KM panel and the KM measurements. While KM deployment has three components, namely frameworks, tools, and innovation, each component is different. Setting up WM is a broad term that refers to the long-term activities that will help KM.

Figure 6: Adapted KM Solution Framework

(International Review of Management and Marketing, Vol 9, Issue 1. 2019)

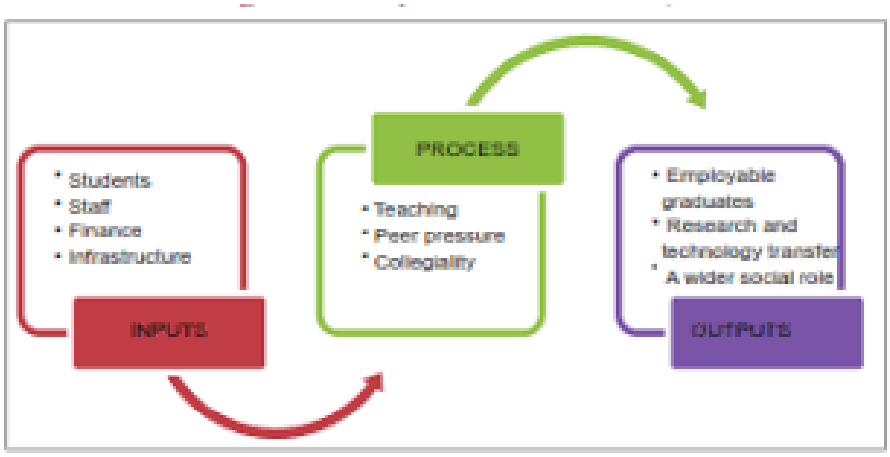


Ogunbanwo's Theoretical Framework

In the view of Ogunbanwo's framework, in order to be reliable sponsors in the realisation of productive and sustainable knowledge management practices (Ifeanyi-obi et al., 2017). People, management and innovation are the four segments of empowerment, while the skills of the methodology are broken down into three parts, planning, strategy and resources. The empowerment capacity comprises four segments: Association, Management, Innovation and People.

Figure 7 Adapted from: Ogunbanwo's Framework

KM Conceptual Framework in Nigeria tertiary Institution (Ogunbanwo's February 2021)



Institutional Palm Oil Framework in Nigeria

In Nigeria, public and private sectors appreciate and support palm oil industry's unwavering performance, although the palm oil industry is privately run, the public sector has a significant impact on the direction in which the industry is headed (Ogundiran, 2019). History has shown that the government's decision to equip a business that can produce palm oil to fuel post-independence development of such will successfully alleviate poverty and put Nigeria at the forefront of oil producers in the world. The important role of the country in developing agricultural land is usually attributed to the rapid development of the palm oil industry, the focus is not only on efforts to increase creativity of palm oil farms, but efforts are also being made to expand business areas as well as creative work practices that will be a useful administrative structure that contribute to overall efficiency (Ogundiran, 2019), this development if facilitated will create strong state institutions and by so doing will lead to the cooperation and contribution

of other businesses. The Palm Oil Registration and Licensing Authority (PORLA) and the Nigerian Palm Oil Council are the three main institutions responsible for achieving the goals set out in the Strategy.

PORLA was founded in 1976 with the mission to set quality standards for palm oil products in order to guarantee a continuous supply of high-quality commercial products, two main control programs were initiated, the first on the nature of petroleum products for their main processing purposes and the second on exchanges, including ports of shipment, to ensure that only individual palm oil products of adequate quality are shipped. Anyone involved in any aspect of shipping, selling, buying, displaying, shipping, importing, storing, researching, or testing palm oil products is required to have a license (Abu et al., 2021). The quality control of palm oil products has undoubtedly contributed to the overall character of palm oil products and thus to the status of palm oil products (Modupe, 2019). The company PORIM was founded in 1978 with the main goal of developing technologies that improve the efficiency of palm oil production, but also expand the use of palm oil. Research at PORIM can be divided into three main areas: science, innovation and also technical-financial and specialised forms of vigilance. The Nigerian Palm Oil Committee was formed in 2000 following the merger of the two organisations to improve the capacities of government agencies established in the sector and provide strong institutional support (Abu et al., 2021). As a leading economic observation organisation, PORIM is able to improve and achieve public goals, methods and requirements for successful corporate development and at the same time, the Nigerian petroleum corporation was commissioned to

develop a comprehensive system that will make Nigeria the world market leader in the oil and fat

industry through special exercises. The company saw the need to develop products to facilitate the upstream development of palm oil and was identified as a candidate for sector support under the Industrial Plan introduced in 1986 (Ogundiran 2019). Previous year's International Palm Oil Conference has highlighted that refining and fractionation are essential to increase the experience and importance of Nigerian palm oil in the world market (Darby, 2009). Nigeria has therefore become a focal point for the processing of palm oil, leaving state's responsible for shipping refined oil. The Nigeria government focused on developing the region in East Nigeria and encouraged the private sector to seek raw materials for further operations in other countries (Darby, 2009). Research and development activities have been intensified in Nigeria, mainly with the aim of increasing the usefulness of the oil palm and adding more value to the products. The Nigeria government's focus is on increasing the prosperity of this sector, so palm oil has been identified as one of the key products to include in the government's long-term strategy to support the economy and achieve wage status (Ogundiran, 2019). In 2022, it is expected that three areas will be explored, including improving the utility of extractive media, expanding downstream operations, and improving the manageability of palm oil operations (Abu et al., 2021).

2.1.3: Theme 1: Historical Overview of Oil Palm Production in Nigeria Using Indigenous Knowledge Management Practices:

Culture (Past)

The oil palm, is native to West Africa, it has long been associated with humanity, after a drought 2,500 years ago, oil palm forests extended to West and Central Africa, which

enabled human mobility and the development of horticulture (Mali et al., 2018). Humans contributed to the development of the oil palm by spraying the seeds, growing them into pieces and eating them. Archaeological evidence shows that palm products and palm oil were an integral part of West Africa's weight management programs 5,000 years ago. Not only was the oil palm production guaranteed to continue, the clean and drained areas were also well supplied (Forutnani et al., 2018). Abandoned cities and ranch fields were routinely turned into oil palm groves; now, the age and distribution of oil palms can be used to easily and accurately identify ancient communities. With the exception of a few “famous” oils palm plantations in the Kingdom of Dahomey, all West African oil palms grew in such wild and semi-wild forests until the 18th century (Mali et al., 2018).

From an early age, women and children collected natural goods for free, and young people received packages of natural products by climbing the highest point of the palm trees. As a result of the arduous and time-consuming process of bubbling and separating new natural resources with water, West African women turned this organic product into palm oil (Igwe et al., 2018). Red palm oil was made from the palm's fleshy mecarpin, but women often split their hands to obtain brown and light palm oil, sometimes with the help of children. From the main course of tingling sweet potatoes, palm oil and canvas salt to the banga soup made from natural ground beef that is left over from palm oil processing, and many other “soups” that are eaten with whipped sweet potatoes or garri (ground cassava), palm oil played a key role in

West African cuisine, including southern Nigeria (Gyamfi, 2017).

Culture/Current*:* A lot of local palm oil farmers in Ologbo Ikpoba-Okha, still use the old practices of women and children helping in planting and extracting of palm oil in the fields using local extraction methods but due to development of technology these farmers now use fertilizers in their farms which helps for bigger and better yields of their palm oil produce (Gyamfi, 2017).

Structure/Past:

In the past Palm oil was also used for cleaning in West Africa; it was used to make traditional bathing soap and used also as washing detergent (Ebhuoma, 2020).

Also palm oil was used to illuminate the castle walls, and even the ruler's palace walls were painted with paints made from palm oil, many unique ceremonials and healing native doctor's use palm oil products in their traditional portions (Gyamfi, 2017).

Structure/Current:

Palm oil is also used for cleaning and for bathing soap in the present but now refined into tablet soap and example of such soaps are now sold worldwide, the Yoruba Dudu- Osun soap sold even In the Uk, Palm oil juice has also been used and also skin lotions are being made from palm oil and daily wound healing ingredients (Abu et al., 2020)

Palm trees are also extracted and used to make palm wine which is bottled and sold worldwide, and palm leaves have been used to cover roofs and shrubs (Chendow, 2018).

Increasing quantities of palm oil were imported into the UK by limited West African

traders such as John Johnson Hamilton, known as “palm oil scum”. However, the operation was not intended for the faint of heart. In the past, traders even spent a month and a half with small scissors to travel to one of the many trading destinations on the West African coast (Gyamfi, 2017). Only a few dozen trading points were located near the so-called oil rivers in today's Niger Delta, the center of the West African palm oil market.

People Skills/Past

Palm oil extraction in Ologbo Ikpoba-Okha has remained a family or sole proprietorship business for years, a higher percentage of people who do palm oil business in Ologbo in the past used traditional methods of making palm oil which included boiling them in drums and then using mortal pistles to extract the palm oil from it and these task where mostly done by the farmers wives and their children in their palm oil plantations (Ebu et al., 2021). A lot of the palm oil procession in Nigeria are done in the local way and it accounts for the weight or bulk of palm oil processed in Nigeria (Chendov, 2018) and (Ebu et al., 2021).

The wild oil palm is only found in West Africa and is not a native species. The “Palm Belt” region in which it grows covers around 70,000 square kilometers and is mainly located in southern Nigeria. Compared to the surrounding vegetation, it takes a wild palm about 15 years to emerge from the bush (about 12 meters) and bear fruit, but a tree grown on a ranch takes only four years to reach this stage (Ansong et al., 2018). Adapted from: The palm fruit is an oval natural product made of approximately one and a half centimeters long palm leaves, which is sold in batches or batches of several hundred pieces (Ansong et al., 2018). The natural product consists of the outer shell, the fibrous layer that contains the oil (mesocarp) that covers the palm

nut, and the part of the palm that is in the nut itself. Compared to the ranch's carefully restored range, the natural wild palm product has a fairly large, thick nutshell and correspondingly smaller oil-filled mesocarps than on a ranch. The difference in yield between wild palms and modern varieties is due to the need for one to five palms per hectare (Mohsin and Syed, 2018). Despite the strong and irregular increase in funds, this trend continues for years. Using the rope as a guide, the wild palm is harvested by climbing a tree, cutting the packages with a knife and dropping them on the ground. Because of the much narrower ranch with thick trunks (about 4.5 m high), plots can be cut using the original method of collecting traps due to the much narrower ranch with thick trunks (Abbas, 2017).

The extraction of palm oil using the traditional method has a clear advantage over conventional palm oil production, the high properties obtained through traditional methods ensure higher yields of palm oil, but also higher extraction efficiency, better oil quality and lower processing costs than in the machanised System (Komleva et al., 2018). Despite these advantages, despite the efforts of William Hesketh Lever in 1907, 1920, and 1925, a pioneering organisation, it failed to build proper palm oil farms around Nigeria (Abbas, 2017), the pilgrims' government (British colonial government) was not entirely convinced that agricultural goods would be created “by their indigenous peoples” under West African conditions and would not be accepted as a “central standard” by the local population, (Kayode et al., 2017). Since the late 1950s, efforts by the Nigerian government to arouse new interests in the palm oil business have been thwarted by high prices for farm lands, (Tharakan, 2017).

In the years leading up to World War I, Dutch residences in Nigeria developed a strategy to keep Nigeria's native palm oil economy to their knees (Roland et al., 2018). West African producers were aware of the pressing factor of competition, which was building at an alarming and potentially life-threatening rate, the discourse was no longer dominated by the mood of gluttony, but by fear" (Kankara et al., 2018). After the battle and the withdrawal of the Dutch, Nigeria's palm oil expansion gave way to collapse and stagnation. In the years after World War II, the Belgian and British possessions in the Congo (liver concessions in 1911) experienced relatively rapid expansion in palm oil produce; the uncertainty of the 1960s turned Nigeria palm oil company's into a failed enterprise, Malaysia poses a current threat to Nigeria's unparalleled pace of palm oil development, and here again, political frameworks, whether as a result of a shared internal burden or external patriotism, can be seen as the potential for expansion of the Nigerian palm oil industry, which resulted in the years of monetary failure of the structure of these indigenous palm oil smallholders being offset by the years of political weakness in foreign-controlled palm oil business (Popoola et al., 2020).

the small palm oil landowners, the pilgrimage group (foreign palm oil companies) aimed to increase the specialised capacity of domestic palm oil production and its intensity in the world market, by offering changes on two fronts: the restoration of a palm grove and further improved extraction techniques, both of which were introduced (Omeihe et al., 2021), but although their request is based on a processing palm oil extraction practice, it is necessary to consider at least briefly the changes necessary on the agricultural side in order to understand the completeness of the difficulties they faced in doing so (Olatunji et al., 2017).

Palm oil tree is not only called oil palm tree, but also Elaeis guineensis **(See appendix 6)** it is made from an organic palm product from Africa, particularly west Africa and Nigeria, it is an essential part of the diet and meals of most Nigerians and is now used as a commercial product (Ogunpaimo et al., 2019).

People Skill/Current

A lot of indigenous farmers in Ologbo Ikpoba-Okha still use traditional methods in palm oil extraction process while the other few remaining use smaller mechanical devices. The processing / extraction of palm oil is usually carried out by contemporary farmers using conventional methods and with the use of little mechanical equipment, (Omeihe et al., 2021) , the size of the preparation units, can transport up to 2 tons of new natural palm oil product packaging per hour, this is considered to be limited, a typical oil extraction process involves dipping crushed natural product crumbs in hot or cold water, removing fibers and nuts from the oil-water emulsion in perforated metal filters, creating bubbles and removing palm oil, and drying the resulting oil (Ogunpaimo et al., 2019). As mentioned by (Chukwu et al., 2020), palm oil is produced in a variety of ways, from modern processes to more traditional methods of preparation.

To date a lot of palm oil farmers in Ikpoba-Okha use large pieces of wood to process / stir cooked organic products, while other farmers use limited range cooker and others use finger pads in kayaks or wooden boxes to process cooked organic palm oil products.

Information Technology/Past

Due to lack of technology in the past in Ologbo Ikpoba-Okha which is a rural area of Edo State of Nigeria, palm oil farmers passed down information from words of mouth, information passed

down from their parents and grand-parents, there were no recorded records in place on how to grow palm trees or how to get good harvest yields, the local farmers had this knowledge based on indigenous practices of their parents, (John and Oyewobi, 2018).

These local farmers used traditional methods to record the right planting seasons, and traditional pest control methods and even to date a lot of the farmers in Ikpoba-Okha still use these methods despite the advancement in technology due to cost (Omeihe et al., 2021).

Information Technology/Current

Due to the rise in information technology, SME's and medium size (Contemporary farmers) in Ologbo have adapted to more mechanized ways of palm oil extraction by using technology to cultivate their palm produce and harvest (Ebu et al., 2021). Palm oil is widely regarded as a rich source for food, medicine, textiles, and winemaking (John and Oyewobi, 2018), some production meters, based on the increase in purchases of palm parts that are little used by locals, show that domestic consumption is between 80 and 150 percent. Prices, depending on the measurement. Oil palm is grown and harvested in forty-two countries worldwide, with Nigeria ranking sixth in terms of production. According to (Yulianti and Surendro, 2018), global palm oil production increased from 11 million tons (MT) in 1990 to 23 million tons in 2000 and then increased to 65 million tons in 2015 according to the World Palm Oil Association and this increase is as a result of advancement in technology, there are machineries used by palm oil farmers in cultivating and extraction of palm produces these days, (Nwabueze and Ntogo-Saghanen, 2017). Nigeria use to be one of the largest palm oil producers in the world, smaller amounts are produced by Thailand, Colombia and other countries. Palm oil is currently the vegetable oil with the most supply, displacing soybean oil from first to second place (Omeihe, 2021). It is the cheapest vegetable oil and outperforms all other vegetable oils in terms of yield per region, exchange and use

worldwide, and efficiency per unit of time. Palm oil is not only found in West Africa, but in other continents in Asia as well. Countries in the region that produce significant amounts of palm oil and palm oil are Côte d'Ivoire, Ghana, Nigeria and Sierra Leone, (Mali et al., 2018).

According to the US Department of Agriculture, Nigeria is the fifth largest palm oil producer in the world, accounting for 1.5 percent or 1.03 million tons of total world production (USDA). Nigeria, which before the 1960s was one of the world's largest exporters of raw palm oil, is now a net haulier. As part of their efforts to narrow the inventory gap and encourage local investment, the federal government has added refined palm oil (RPO) as one of the products that traders in the interbank market cannot buy to encourage local investment (Omeihe, 2021), in addition, Nigeria government has proposed to increase the commitment fee for crude palm oil (CPO) by 35 percent subject to access routes, the Central Bank of Nigeria (CBN) has published a number of action plans, including the Anchor Borrowers program, which is being implemented in phases, the aim of the initiative is to offer farmers low-interest single-digit loans through custodian banks and other participating financial institutions, for the palm oil industry, the upfront premium is 9% per year (John and Oyewobi, 2018), in addition, the Nigerian federal government has commissioned the Central Bank of Nigeria (CBN) to support economic organisations and individuals involved in the production of ten specific agricultural products in 2019, Palm oil was one of the ten products identified, it is harvested in an environmentally friendly way, as was the case in West African countries with a smallholder who believes in limited breeding techniques (Izah and Seiyaboh, 2018).

Knowledge Creation/Past

In those days, Knowledge creation when it comes to palm oil extraction used to be passed down by words of mouth from the farmers to their family members or other local farmers, and the farmers use to share seedlings among themselves with often times no support from the local government or from banks, after a series of long attempts at propagation, the Nigeria Ministry of Agriculture began in 1927 to distribute selected seedlings free of charge to local palm oil breeders in order to facilitate the settlement of palm groves (Jellason et al., 2021).

Knowledge Creation/Current

Present day in Ologbo Ikpoba-Okha, a lot of the indigenous farmers still use the traditional knowledge creation methods, but some of the SMEs and medium (contemporary) palm oil businesses are able to access agricultural new methods of palm oil extraction as they can afford to buy the technology, they need to train their workers to improve their farms (Jellason et al., 2021).

Socialisation/Past

In the past there were no farmer unions, most palm oil farmers were family members and their businesses were supported by their neighbors or family members (Chukwu et al., 2020).
The Palm oil Growing Ordinance was issued in 1935 in Nigeria, it offered farmers a financial incentive to set up a plantation and gave them the opportunity to reclaim the preferred farming obligations (Jellason et al., 2021).

Socialisation/ Current

There are lots of palm oil farmers union across Nigeria at present and some of these unions are supported by the Nigeria Agricultural ministry of information, (Omeihe, et al., 2021) who support these local farmers by giving them seedlings, directing them on how to access financial

farming loans and in Ologbo the SMEs and medium palm oil farmers have unions they attend meetings with regards to safeguarding their business (Makate, 2019).

Combination/Past

In the past there were no model or protocols created by the Nigeria government or local farmers on how to do palm oil extraction despite support from the Nigeria Agricultural department, in 1938, only 5,530 of the almost 1,000,000 farmers in Nigeria planted palm oil seedlings, which give them all 9,213 acres of land used in farming their palm oils (Jellason et al., 2021).

Combination/Current

Most indigenous farmers in Ologbo Ikpoba-Okha, still do not have models they use to do their oil palm business, but some SMEs and medium size farmers in Ikpoba-Okha have their individual company models they have developed to do their palm oil farming (Makate, 2019).

Externalisation/Past

There have been disappointing results to palm oil farming for years in Ologbo Ikpoba-Okha Edo State Nigeria and this can be traced back to several factors, mainly lack of proper data information data for palm oil farmers due to lack of technology, land discontinuity and land ownership complications that were difficult to manage with no monetary incentive effect/an occasional shortage of seedlings, no differences in critical values for better oil (Igwe et al., 2018).

Externalisation/Current

These days the Nigeria Agricultural ministry do support local palm oil farmers, data on palm oil yields, farm treatment techniques, new and better ways of palm oil farming information is shared to local palm oil farmers and their concerns is shared with their local government agriculture

liaison officers, even the Nigeria government is looking at eventually evaluate the imposition of palm trees, as it did in some regions with Cocoa beans (Igwe et al., 2018).

Internalisation/Past

In time past, information for palm oil farming and extraction came from word of mouth, information on how to plant palm oil seedling, cultivation of the land and other ways to maintain palm oil fields was passed in the traditional ways, word of mouth or people doing it the way they saw their parents do it in the past (Forutnani et al., 2018) but over time some SMEs and medium farmers who have the technological resources in the past 50years do have access to information to help their palm oil fields(Ebu et al., 2021).

Internalisation/Current

Information used currently by SMEs and medium (contemporary) palm oil farmers come from reports or as the result of external information about palm oil extraction techniques (Ibrahim et al., 2018). Contrary to Professor Hancock's focus on ineffective efforts to improve palm oil agriculture (Ibrahim et al., 2018), Richenda Scott points out that there are still unresolved technical problems when it comes to palm oil extraction practices (Forutnani et al., 2018).

Due to internalisation, “Over 3,000 acres of palm oil groves have been planted under the supervision of the Nigeria Department of Agriculture, but not one has proved a complete success (Izah and Seiyaboh, 2018), a serious falling often in yield occurs after the ninth or tenth year, while even peak years have shown yields much below those of the Far Eastern plantations. The cultivated palm tends to exhaust the fertility of the soil more rapidly than the wild palm growing under natural conditions, for in the bush or dense palm grove the nonbearing palms and other trees provide considerable plant nutrients, which they draw from the subsoil and from which the

palms in benefit. This supply is lacking in the carefully spaced palm groves of 60 trees to the acre. At the present time Nigerian farmers are not being encouraged to start oil palm plantations until methods of combating the resultant soil deterioration have been explored" (Izah and Seiyaboh, 2018).

KM intermediate Outcomes and its Organisational Creativity/ Past

Due to lack of investment and proper government support in the past to palm oil farmers in Ologbo Ikpoba-Okha, there had been low performance for palm yields, literacy and lack of information on palm oil farming prevented local farmers from expanding and exporting their palm oil products (Bayat et al., 2018).

KM Intermediate Outcomes and its Organisational Creativity/Current

After the establishment of the West African Oil Palm Research Institute was established, which significantly increased the number of offices dealing with land resources and other matters relating to palm oil (Irivboje et al., 2021). A research carried out by WAIFOR's research has made a significant contribution to the understanding of the environmental factors that influence the palm oil industry and has provided significant results at the application level in the following areas: Reproduction of stable cross-sections of the high-yielding palm oil area; large-scale production of seedlings selected for distribution by the territorial agricultural services; Preventing infections; and best agricultural practices (Irivboje et al., 2021). A key global study by WAIFOR found that Nigeria benefited from significant crop production less regularly than its main rivals Malaysia and Congo due to the country's relatively low rainfall, including long dry seasons, modest daylight, and intact, including insufficient number of sandy soils (Garedew et al., 2017). At the applied level, the Department of Agriculture recommended the use of fertilisers and catch crops as techniques to make them grow better (Irivboje et al., 2021).

Organisational Performance Past and Current

Another major improvement after the second world war was a change in government policy to encourage mass ranks formation, rather than relying on new financial support, but instead relying on ranch or business plans to achieve it (Ebu et al., 2021). The largest project of its kind is near Calabar in Kwa Falls began in 1948 with the displacement of around 200 farming families from the overpopulated areas of the eastern region (Dishan et al., 2019). The project was completed in 1951, although the plan was abandoned in 1955, the site was still used as the main ranch for the East Nigeria Development Corporation at that time, the negligence is attributed to the lack of support for forestry, the inability to follow the agricultural recommendations of the Nigeria Department of Agriculture, and the general lack of enthusiasm of the Pilgrims, (Boamah and Liew, 2017). In 1964, the Nigeria Agricultural Department built five residences in approximately 19,000 planted areas divided into five neighborhoods for palm oil farms, Since the ranch estate plans began in 1961, an additional 2,000 lots have been planted in various ranch settlements. About 17,000 lands were planted on the West Nigeria Development Corporation sites and 3,000 in ranching communities in the west of the country, two consolidated ZAK properties, each with 6,500 parcels, one in the east and one in the mid-west, are now replanting palm oil trees (Bhardwaj and Tomar, 2018).

2.1.4: Theme 2: Current Palm Oil Extraction Practices and Knowledge Management (KM) of Small and Medium Producers of Palm Oil:

Culture

Most small and medium palm oil producers in Ologbo Ikpoba-Okha and other parts of Nigeria use machanised tools in carrying out palm oil extraction as a result their yields have increased,

(Ebu et al., 2021), an average of 174.67 liters of palm oil are consumed annually, based on this evidence, palm oil production can still be modest and limited (Ebu et al., 2021). The majority annual yield transaction from small local palm oil farmers in Nigeria is estimated between N151,000 and N200,000, while the average annual turnover was N 163,417 according to the Nigeria Agricultural Department, from this it can be concluded that palm oil farming brings in reasonable money (Ebu et al., 2021).

Structure

In the past extraction and dealing in palm oil was a simple process done in the traditional way in Nigeria from purchases, handling, shipping, and labor cost and these activities was carried out by workers in the field (Omeihe et al., 2021), but this structure has changed somewhat as a lot of the small medium farmers have the resources to employ workers in the palm fields and there is division of labour from those operating the machinery during planting of new seedlings, to those harvesting the ripe brunch and those who do the oil pressing in the mills (Ebu et al., 2021).

Contemporary palm oil farmers in Ikpoba-Okha use various methods to convert organic palm oil products into edible oil, these processes they use are divided into four categories, depending on the amount of oil pumped and the complexity of the functional equipment of the system. Although some small and medium farmers still use some form of traditional techniques, mechanical devices with a limited number of operations, medium-sized factories, and large modern factories (Beebwa et al., 2019). Most experts in the field of palm oil processing believe that formulations that process up to 2 tons of new natural product packaging per hour are limited in scope. In general, medium-sized and some SMEs of palm oil farmers use systems that communicate between three and eight tons of palm oil per hour (Fresh Fruit Bunches); the

gigantic scale refers to structures communicating at speeds of more than 10 tons per hour (Ebu et al., 2021).

In general, palm oil extraction process used by SMEs, small and medium palm oil farmers for extraction, involves collecting new packaging of natural products from ranches, disinfecting and sifting packaging to release the natural palm product, pressing leaf food from unrefined palm oil, and converting refined palm oil into a natural press palm product, raw palm oil is also processed to be purified and dried to increase yield and cost. Palm oil processors of all sizes go through these unit functional steps to manufacture their products (Akinwale et al., 2018). Palm oil extraction differ in the degree of automation of each operation of the unit, as well as in the materials that connect the movable frame elements, which can be grouped or continuous, it should be noted that the number of jobs done by SMEs, medium and small palm oil farmers vary depending on the degree of mastery of the cycle and the quality of the case that can be achieved through an automated approach (Ebu et al., 2021).

The production of palm oil is characterised by low efficiency both at the source (wild forests) and during processing (conventional processing) (Ebu et al., 2021). The lack of advertising and office space, as well as many middlemen in the value chain, may also have played an important role in discouraging mostly indigenous (traditional) palm oil farmers also due to production costs but medium and some SMEs farmers can afford the process, (Anike, 2017). According to (Thompson et al. (2020), the main needs related to palm oil production are a list of sources of information, not preparatory procedures, poor print quality, no foundations, and expensive transportation. The conventional method of palm oil extraction dominates the creation of palm

oil, which means that the return in palm oil production among most indigenous farmers remains low, in addition, this method is extremely troublesome and time consuming compared to mechanical techniques (contemporary farming techniques) because it requires a large number of people to successfully complete the task (Zakariyah et al., 2020). Due to the high processing costs associated with the creation, excessive fees arise, a lot of indigenous oil farmers in Ikpoba-Okha, due to lack of infrastructure such as storage space, transport systems, access roads and communication channels are further causes of inefficiency in the value chain (Akanle et al., 2017).

However, it has been found that the preparatory activities for palm oil extraction are inundated by indigenous farmers Ologbo Ikpoba-Okha of Edo State networks, although these indigenous palm oil farmers represent the highest palm oil production in the state, their production does not quantitatively and subjectively meet local needs, (Sithole, 2020), the framework for palm oil production in Nigeria can be divided into two categories: the concept of developing natural palm products and the size of the country (Wood and Bischoff, 2019).

The huge palm oil plantations in Nigeria which are owned by large palm oil businesses, rang in size from 500 to 10,000 hectares, cover around 118,264 hectares according to the available data and account for only 5% of the country's total oil production (Garedew et al., 2017). medium and SMEs and indigenous farmers ranches also share semi-normal or endless palm groves totaling 2,100,000 hectares, with 83% of the forests planted and the remaining 12% being government plans for small co-operatives and co-operatives, non-co-operatives, including home builders, smallholders, and medium-sized ones Ranches (Bhardwaj and Tomar, 2018).

People Skills

The skills needed by indigenous, SMEs and medium farmers for palm oil can be easily learnt (Zakariyah et al., 2020), some of these skills include the phase of breaking the palm seeds into small particles pieces through mechanical equipment's and then heating (boiling) them and extracting the oil with an oil ejector or oil believed to be soluble, it is at this stage that it is necessary to clarify the oil, which can be obtained by pressing the canal or decanting (Abdulkadir and Maifata, 2017). Mining, a well-established palm oil field by medium or bigger palm oil industries, has a large number of global manufacturers ready to provide equipment that can move from 10kg to several tons per hour. In Africa and Nigeria in particular, the small-scale, highly-governed city businesses, made strides in developing these huge, fully automated palm oil mills and locating them on the ranches that supply the world's oil refining industries, and developing this wide variety of oils, Palm mills and their facility on farms provide food for the global oil refining industry (Suurshater and Tope, 2019). Several SMEs and medium palm oil companies' production rates from two hundred to three hundred kilograms to eight tons of palm oil output per day, they deliver palm oil to the domestic market. Research organisations, improvement organisations, and private room design teams of workers who try to automate and further improve traditional manual processes, but these efforts have been fragmented and negligent in implementation (Ogar et al., 2020).

Most African palm oil producing SMEs and medium palm oil businesses have developed small mechanical and automated fermenters handled by people which are usually smaller but unheated versions of the large energy ones (Ogar et al., 2020) palm oil processors of all sizes go through

these unit functional steps to manufacture their products (Nwammuo and Salawu, 2018). Palm oil extraction process by farmers differ in the degree of automation of each operation of the unit, as well as in the associated materials that power the devices that provide the connection or stability of the frame. The amount of work varies based on the level of cycle control and product quality that can be achieved through an automated approach, (Njar and Enagu, 2019).

Information Technology

Technology with regards to palm oil farming and extraction has improved a lot mostly with SMEs and Medium sized palm oil farmers (contemporary farmers) (Ebu et al., 2021), these business are able to obtain and look at researched based data's that help them in the way palm oil farming can be doing successful to increase yield., due to technology palm oil farmers are able to know things such as, oil content of palm seed is extremely low in the early stages of its development, as the palm seeds developed, the distribution of the oil increases rapidly, reaching around 50% of the Mesocarpar , (Mohammed et al., 2019).

Palm oil farmers mostly the medium size and SME's farmers now know that during the time spent cutting palm brunch, natural objects can be pierced to expose the back of the packaging in order to perform the stalk cutting process, if the package (approx. 25 kg) falls on the floor, the natural product will be damaged, there is also the possibility of damaging the natural product when stacking and emptying the packaging inside and outside the transport compartments (Igwe et al., 2020), with this type of information technology medium and SMEs (Contemporary farmers) in the near future will hopefully be able to compete in the export palm oil market in the world stage (Zakariyah et al., 2020).

As a result of technology, experts in the manufacture of edible palm oil know that increasing the fertilisation in the palm fields adds to the yield and to the taste of the oil. An oil with a high concentration of fertilisation has significant cleaning properties (Haider, 2019).

Knowledge Creation

Medium and SMEs (contemporary) farmers know that Knowledge is created and gained from the extraction of palm oil produce by farmers through the different methods and mechanism they use in carrying out their work. The quality of the bundles of palm oil produce is the first indicator of the level of quality of harvest achieved. The method of harvesting cannot improve the quality of the palm produce, but it can prevent or limit destruction of palm seeds, (Gope et al., 2018). Knowledge creation in harvesting palm produce could help to control the harvesting process.

Socialisation

There is cooperation among some SMEs and medium size palm oil businesses in sharing information on data with regards to latest systems in place to carry out their work effectively in their palm fields (Ebu et al., 2021), A lot of palm oil farmers use the new organic product packaging of palm oil this consists of an organic product that is placed in the ears of wheat growing on the main tree. In manual screening, the organic material loaded on the thorns is cut from the package handle with an ax or knife, and then the organic product is isolated from the thorns with an ax or knife and this information which helps the palm to grow more brunch is shared among palm oil farmers and workers in the fields (Ekwoaba and Adekanbi, 2018).

Combination

Most SMEs and medium size palm oil businesses employ workers whether young or old who are paid or rewarded for their efforts in these palm oil fields. Bigger palm oil businesses use other palm oil extraction processes for large scale processes such as using a frame which is driven, a

rotating drum or stationary drum with rotating agitators that separates the palm seeds produce from the bunch, (Ajayi et al., 2020). Most indigenous palm oil farmers are incapable of generating such due to cost.

Externalisation

Most palm oil extraction for indigenous, Medium and SMEs businesses is done outside the farm mills, because palm oil extraction process consumes a lot of water, high pressure steam cooking is more effective in heating the palm seeds because less water is lost (Ekeke et al., 2017). As a result, most of the medium and big palm oil companies inspect the bundles of palm bunch before cooking the products because they can afford to, but for some SMEs and local farmers the cost of doing this is too much for them to afford (Ajayi et al., 2020).

Internalisation

In Medium and some SMEs palm oil farms in Ikpoba-Okha, the bundle of palm seed waste is incinerated and the resulting residues, which contain a high potassium content, are returned to the property as compost this same process happens also in small size farm oil mills is burnt and the shells used also as compost in the farm, (Chukwu et al., 2020).

KM Intermediate Outcomes

Due to development in palm oil extraction processes, SMEs and medium palm oil business have started expanding their palm oil field and buying more acres of land in some business in the Ikpoba-Okha area to expand their businesses, (Buochuama and Akhabue, 2018). Unlike in the past during palm oil extraction oil compounds are destroyed by heat treatment, which also traps hydrolysis and auto-oxidation, but with proper information this is avoided and cleaner palm oil is processed, (Arabomen et al., 2019). Too much high temperature in palm oil extraction process can destroy the oily cells in the mesocarp to a certain extent, (Idu et al., 2020).

Organisational Performance

Palm oil extraction done by small, SMEs or medium palm oil farmers if done properly tends to improve the financial input of the businesses thereby improving organisation performance, (Majekodunmi, 2018). A well planned and carried out palm oil extraction process is one of the most important steps in improving organisation performance for palm oil companies, (Suurshater and Tope, 2019).

Njar and Enagu (2019), disinfection of palm seed bunch can also lead to high yield harvest and lead to good organisation performance.

2.1.5: Theme 3: Generating New Ideas and Sustainable Ways of Natural Resources Management of Palm Oil Extraction:

Culture/Past

According to public information, Nigeria overtook the United States as the world's largest producer and exporter of palm oil in 1965, (Njar and Enagu, 2019) and also in 1960s (Chukwu et al., 2020) and this remarkable success prevented the country from adding a "product" to the price trade since 1974. It is expected that the low participation of palm oil in the land price trade will have a significant impact on the country's ability to develop a creativity plan that can adapt and exploit the interests of indigenous people in all weather conditions (Yadav et al., 2020). The results of the West African Agriculture Conferences, which took place between 1927 and 1930, shed light on the reasons for the decline in Nigerian palm oil exports, in the discussions, participants discussed the collapse of the Nigerian palm oil trade to the point of bankruptcy, the inability to significantly increase real estate, and the poor quality of the oil produced. In Nigeria, which was the world's

largest producer and exporter of palm oil before the 1960s, the development and progress of activities has slowed (Tume et al., 2019).

Culture/Current

For Nigeria to go back to its palm oil great success story of the 1920's and 1960's according to (Njar et al., 2019), it needs to create sustainable ways of carrying out palm oil farming and extraction process, it needs to learn from the success story of countries like Singapore, where farmers of palm oil field are given free lands and also finances at the first few years of their business to develop (Yadav et al., 2020) also the youths of Nigeria have to be encouraged into taking up palm oil farming (Nwafor et al., 2018).

Structure/Past

Unsustainable development of the Nigeria palm oil business has created a number of problems since the middle 1960's, including a decline in palm oil exports a lack of independence in the domestic supply of palm oil, and the importation of palm oil to meet public demand (Yadav et al., 2020).

Structure/Current

The federal government of Nigeria and several state governments have addressed some of the difficulties faced by palm oil farming and funding issues and came up with setting the following palm oil organisations to generate new ideas and sustainable ways of natural resources management of palm oil by creating the following institutes to address the issues (Tume et al., 2019). (1) Nigerian Palm Oil Research Institute (NIFOR) founded in 1964, that looks at different planting and maintenance of methods of Nigeria palm oil crops; (2) privatisation of state palm oil plantations that supports local palm oil farmers in different states of Nigeria to acquire lands for their palm oil farms and supports them in their palm oil field developments; (3) DFRRI-supported

Seed Propagation/Oil Cage Program (1987-1990) this institute supply seedlings to local palm oil farmers and also teacher them about fertilisation of their local palm oil farms; (4) the Nigerian Land Development Administration (NALDA) improvement program, another organisation set up for sustainability of the Nigeria palm oil businesses; (Okiki and Alabi, 2019). Others include (6) National Accelerated Production of Industrial Plants - NAICPP - and (7) National Accelerated Production of Industrial Plants - NAICPP - (1994-2002).

People Skills/Past

One of the failings in the past when it comes to sustainability and management of the palm oil business in Nigeria in the past is the fact that there was not much development on the people skills of how they can use their indigenous practices to increase their palm oil farm yields (Tume et al., 2019). The Nigeria Government support and sharing of much needed information between palm oil farmers in the past was restricted to hear-say or word of mouth.

People Skills/Current

When it comes to people skills in generating new ideas and sustainable ways of natural resources management of palm oil extraction in Ologbo Ikpoba-Okha, the dream by the Nigeria government remains to reach a public agreement on the independence of palm oil production so that local farmers can get the help they need and be able to develop their palm oil farms and their skills to compete in the international palm oil exporting business, (Nwafor et al.,2018). For the time being, however, governments, multilateral financial organisations, the private sector, including private banks, as well as joint donors, development partners, and the United Nations are supporting and promoting one large agro mechanical model, not a smaller one (Nwafor et al., 2018), to develop people skills for palm oil extraction farmers.

Information Technology and Knowledge Creation/Past

In the 1960s, concern arose about the environmental risks associated with palm oil agriculture as a result of technology, fueled by Rachel Carson's book Silent Spring, published in 1962 (Opeke et al., 2019). A 2004 report by the UK Department of International Development showed that the development and growth of horticulture had a negative impact on palm oil seedling and extraction, hence the idea of generating new sustainability ideas of ways of palm oil extraction without damage to the environment was suggested.

Information Technology Knowledge Creation/Current

As part of an effort to develop the palm oil sector, the World Bank invested more than $ 2 billion in information technology and knowledge creation information, more than 45 initiatives in Southeast Asia, Africa and parts of America in 1965 to develop information technology in relation to knowledge creation of palm oil extraction, (Lawal et al., 2020). Nigeria received a total of $ 618.8 million in grants, making it the main beneficiary. Nigeria received the second largest grant amount with $ 451.5 million, followed by an additional $ 383.5 million in project grants (Lawal et al., 2020). With six palm oil operations between 1975 and 2009, Nigeria was the second largest recipient of Summit Bank grants to palm oil companies during that period (Ogar et al., 2020).

In recent years, concerns about climate change have increased due to human development efforts, people around the world, regardless of identity, age, education or ethnicity, continue to debate rising global temperatures, the impact on childcare, deforestation and other climate impacts from reckless events (Lambin et al., 2018). If desired, all improvement initiatives in the public and private sectors must be launched as part of a verifiable event. Practical progress has proven to be the most common term used in almost all contracts to describe the effect of a proposed improvement (Chukwu et al., 2020).

The expansion of palm oil agriculture is one of the main causes of the loss of tropical biodiversity in the world (Agri et al., 2018). The growing world population and increasing food needs have resulted in a dramatic expansion of rural jungle areas, with 80% of the world's new agricultural land created by converting tropical forests (Adeniran et al., 2020). Agriculture is, among other things, a great beneficiary of commons such as water, forests, nutrients and fields. Consequently, these activities can have negative effects on the environment through the misuse of natural resources as a source of information or the use of natural resources as a source of pollution hence there is need for new sustainable ways of doing palm oil extraction, (Samuel, 2021). Experience shows that companies that rely on the intensive use of information resources or technology are more likely to make mistakes that lead to natural corruption of palm oil seedling or extractions, (Owolabi, 2018).

Socialisation/Past and Present

In other to develop and maintain a sustainable way of palm oil extraction things such as land corruption as a result of technology has to be tackled, as it has a negative impact on the productivity of existing farms and fields (Owolabi, 2018). Many non-industrialised countries have poor or degraded agricultural land that is susceptible to cultivation, making cultivation difficult. It is estimated that around 1.2 billion hectares (almost 11% of the world's vegetation) have been affected by human activities in recent years, it is estimated that severe corruption in agricultural countries will result in annual losses of 5-12 million hectares (Onyeneke et al., 2017). Many factors contribute to the deterioration, including water and wind spoilage, industrial and agricultural pollution (including overuse of pesticides and compost), and excessive use of water in the water system leading to desalination, (Lawal et al., 2020).

Combination/Past and Current

Most palm oil farmers tend to combine different techniques in their palm oil extraction practices such as floodplain horticulture a significant amount of water is used to plant palm fields and also in the extraction of palm oil and this is critical to global food production. Flooded arable land accounts for one fifth of the world's arable land and accounts for 40% of the world's food reserves (Lawal et al., 2020). Over 80% of Southeast Asia's water resources are currently used in palm oil farms and other horticulture. However, despite significant investment, the water use productivity of the water supply system is generally quite moderate (Lambin et al., 2018). This raises serious concerns about property loss and ongoing disputes over water rights. Unjustified use of groundwater can have undesirable consequences, such as contamination of drinking water with arsenic.

Externalisation/Past and Current

Different agricultural structures and landscapes are used by different palm oil farmers around the world and different palm oil extraction techniques are also used around the world all to maintaining and controlling pests and soil productivity to enhance sustainable ways of palm oil extraction, (Ior et al., 2017). Deforestation is one of the greatest threats to sustainability of palm oil farming and palm oil extraction in tropical forests around the world, particularly in Nigeria and the rest of Africa, (Hooli and Jauhiainen, 2018).

Internalisation/Past and Current

In Nigeria and global demand for food continues to grow, but many people around the world, especially in African countries, are starving because of limited access to a wide variety of foods, hence the need for sustainable way of farming, (Hooli and Jauhiainen, 2018). According to a 2009 report by (Aluko, 2018), it was estimated that around one billion people worldwide were undernourished. Palm oil farming and horticulture is one of the main sources of income in

Nigeria and a lot of non-industrialised countries has proven to be an effective tool in alleviating poverty among the neediest (Guiriba, 2019).

Intermediate Outcomes/Past and Current

The concept of sustainable progress was born out of the post-war environmental development movement that recognised the negative effects of human expansion and improvement on the environment and transport infrastructure (Esan and Ojemola, 2018). Reasonable development of palm oil extraction can be defined and deciphered from different perspectives, but its basic approach involves a balance between conscious ecological, social and economic needs and land constraints. The most frequently cited definition comes from Our Common Future, also known as the Brundtland Report, which was drawn up by the World Commission on Environment and Development (WCED) in 1987, (Erinoso and Aworinde, 2018), the report talks about the development of global plans for palm oil produce as well as attitudes towards financial, social and environmental events (Akinwale, 2018).

Organisational Performance/Past and Current

The commission called the Brundtland commission was organised to look at palm oil farming practices, the Brundtland Commission proposed seven key interrelated recommendations for sustainable organisation performance and development: (i) Reconstruction of development; (ii) change the quality of development; (iii) relate to basic professions, food, energy and water needs; (iv) ensuring a viable population level; (v) maintaining the capital base; (vi) redirect innovation and control risk; and (vii) blending climatic and financial conditions (Nhemachena et al., 2020). However, this document did not provide a framework for further developing the sustainability strategy. Every country has to develop its own technology tailored to its needs to promote sustainability of palm oil farming (Ahmadu, 2017). It has therefore led to a different

understanding of the principles, especially in industrialised and developing countries. Given that every country has fascinating challenges, development and data requirements, there was an urgent need to examine sustainable progress at the public level (Ngulube and Ukwoma, 2019).

The newly established countries emphasized the integration of natural and monetary factors in progress decisions so that decisions made now will not have negative effects in the future on organisation performance and vice versa, however, there is an urgent need to ensure that decisions taken in the context of the fight against natural corruption do not jeopardise the stability of the global financial system (Adeyemi and Oyinloye, 2020). Agricultural countries, on the other hand, are more interested in meeting the needs of today's generation, provided that those who cannot cope with the current problems do not care about long-term natural corruption. Its main objective is financial growth through, among other things, improving the grassroots, increasing the food supply through horticulture and creating additional employment opportunities for private individuals, (Adeyemi and Oyinloye, 2020).

Three Pillars of Sustainable Development

An improvement in monetary progress could only be observed at the beginning of the 20th century, however, the perspective begins to change regularly, as every improvement method brings with it a number of challenges, also from a natural and social point of view, such as the question of needs, the wage gap and friendly and unpleasant influences, these challenges leave some people feeling like the situation is hopeless (Adetimehin et al., 2018). These perspectives are contained in the Brundtland Report, which provides an alternative framework for recognising the importance of controlled development for long-term sustainability. Controlled growth is a visionary improvement perspective that is divided into three pillars: monetary development,

environmental security and social value or benefit to society, (Adekannbi and Adeniran, 2017). To ensure that the improvement is turned into reality, it is necessary to examine the interrelationships between these pillars. Due to poor planning and short-sighted development, various development projects in different countries, regardless of their current level of development, have led to conflicts with the environment and public opinion in recent years. This results in negative climatic effects such as environmental pollution, soil degradation and disasters, which have a negative impact on the social well-being of the residents (Ior et al., 2017), even if only a few years have passed, the misconduct persists and has become practically difficult and time-consuming.

This overall meaning of continuing progress has been taken from different areas to represent the main exercises of the main exercises and activities in each area. Commercial horticulture is a common term in agribusiness, and one of the definitions used in the United States was defined by the American Society for Agronomy (ASA) in 1989, which is based on the American Society for Agronomy (ASSE), (Nwafor et al., 2018). It is possible to run a sustainable agribusiness that improves the quality of the environment and the property base on which horticulture depends in the long term, meets people's basic needs for nutrients and fiber, is financially sustainable and increases the personal satisfaction of farmers and society as a whole. The comprehensive concept contains a fundamental element of practical improvement, which includes monetary, biological or climatic as well as social and other aspects. The three pillars for possible improvement are also presented in the 2004 report of the DFID (Department of International Development), which describes the concept of sustainable agricultural development (Tume et al., 2019). It is not enough to worry about the initiation of changes from a natural or biological point of view; rather,

when assessing the sustainability of agriculture, both the monetary and social dimensions and the broader political dimension must be taken into account (Mahwasane, 2017). The financial benefit of reinvesting to keep up with the assets is key to environmental and social maintenance of utility facilities. In this sense, the balance between these three factors is one of the most difficult challenges in developing the concept of horticultural support (Mafongoya et al., 2017).

Management in the sense of Guiriba (2019) means creating and maintaining situations in which people and the environment can peacefully coexist in order to meet people's current and future needs. As climate change affects society and the economy, economic methods must take into account the fundamental interactions between activities.

Pillar 1: The Environment

We live in a biosphere supported by a natural pillar, the largest structure on earth. There are many reasons why it is so important, including the fact that it encompasses a human framework that encompasses both a social and a financial framework. Therefore, several columns present the climate as a whole with the social and monetary subsystems (Samuel, 2021). in all respects, the environmental pillar is the greatest real problem in the world, as it is described as the ability to continuously improve the quality of the environment while maintaining asset recovery rates. In the monetary context, less money can be earned with lower limit values for compliance with the climate, since the state support from the social framework is lower.

Pillar 2: Society

The social welfare of a nation, territory, or association can be sustained over the long term (Zakariyah et al., 2020). Social support should be a priority for companies when it comes to their warehouse network and staff. There are several ways to improve social management.

- Empowering people to take action to improve their current situation, especially in polluted and over-used areas.
- Give the community access to data that can help them see and support the business.

- Promotion of sustainable progress, adaptation, planning or networking through measures such as green framework conditions and the development of environmentally friendly energy.

Pillar 3: The Economy

According to the financial column, at some point the economy will no longer be able to maintain its current level of cash yields (Samuel, 2021), this column is often a catalyst for naturalists who discontinue their efforts because of this. Subsidies and speculation are usually lost when the economy is weak. The focus is on shifting environmental problems to financial problems while neglecting the long-term fate of the climate. When it comes to money, there is another way to limit the natural gap: price. Defined by the economics of a new, more sustainable invention, it will inherently be more difficult to implement than an inherited innovation. Efforts have been made to reach agreements that will benefit both business and the country as the public realizes the importance of natural governance. To promote a green strategic approach, governments began to provide incentives and tax breaks (Samuel, 2021).

By reducing the amount of waste and increasing the use of recycled materials, some of the concerns of some groups have been addressed while reducing the environmental impact. In order to let networks, grow, they need new freedom of positioning. Here comes the creative innovation. Securing the financial stability of organizations that rely on permanent resources also makes ends meet. Companies will cease to exist when the funds the organization relies on disappears. It is therefore in the interests of these organizations to preserve existing resources for the future and to find new sustainable business methods that do not jeopardize the long-term success of the company.

8 Steps to Knowledge Management Implementation

When it comes to planning for common problems, this eight-step strategy will help you reduce risk and increase returns (Ogar et al., 2020), in order to implement the new relevant program, this technique was developed from proven exercises. Construction, planning and compositional requirements are the foundation for early progress, while performance and continuous improvement are the foundation for later development.

Step 1: Establish Knowledge Management Program Objectives

Before choosing a tool, defining a cycle and developing a workflow, it is necessary to think and describe the desired end state, Identify and maintain business challenges that require a business purpose and driving force that provides execution power and legitimacy, Set short- and long-term goals that respond to business challenges and support business drivers. Transit destinations should seek to confirm that the program is on the right track, while long-distance travel destinations help develop and convey the broader perspective of the program (Samuel et al., 2021).

Step 2: Prepare for Change

Cultural change takes place when managers are informed. It's more than just applying innovation. Most likely, sales reps will need to rethink how they disseminate the information they create and collect. The exchange of information is sometimes made difficult by the fact that companies want to reward individual results. While information exchange and information-based culture have been criticized, the “Information is Power” program promotes the idea that “Information is Power” is. as a result, some groups may refuse or even attempt to disguise changes to the association's standards and agreements in order to effectively implement other information about the management program (Zakariyah et al., 2020). be prepared to watch social change to mitigate any negative effects. Register with an association of information-sharing ombudsmen who promote information-sharing practices in their area of expertise and provide valuable feedback to the leadership group.

Step 3: Define a High-Level Process as a Foundation

Communication with managers with a high level of detail is essential for successful Implementation, it is important to start with a solid cycle in order to rationally create and refine point-to-point systems in steps 4 through 6 (Samuel, 2020), it is important to note that those who use and consume information should also be included in this conversation before the seventh step, the cycle must be completed and approved (performed). Associations cannot reach their full potential by ignoring or categorizing information about panel interactions. At best, knowledge is

identified, recorded and disseminated spontaneously. The board has recommended a number of practices that organisation should include in their plan.

Step 4: Determine and Prioritize Technology Needs

It's a great opportunity to see what innovation updates and automates an organisation vision and array of activities. Management innovation is a huge and diverse market for municipal contracts, organisations need to know who the main suppliers are, the costs and benefits of each type of innovation and how each contract can help or hinder them in achieving their goals (Ogar Et al., 2020), also find which agents they are using today, what works and what doesn't when purchasing a new innovation to take their time until they have determined whether the existing extensions currently meet their requirements. Alternatively, when there is a lot of help the organisation needs and better configuration and automation, wait for the program to end to make costly technology decisions.

Step 5: Assess Current State

Once the organisation has created their program goals, socially adaptable, meaningful, not really set in stone and aligned with the organisation innovation needs, they can take a look at the current status of the information panel in the organisation. Each of the five elements of the board must be assessed including staff, measurement, innovation, design, and culture. The periodic evaluation should contain a summary of the actual situation, the gaps between the actual and target situation and suggestions for closing these gaps. These tips will serve as the basis for the synchronization guide (Ogar et al., 2020).

Step 6: Build a Knowledge Management Implementation Roadmap

As the status review approaches, it is time to create a roadmap for implementing your management program vision. It is important to reaffirm the approval and responsibility of the high authority before the organisation goes too far (Omeihe et al., 2021). If not, their efforts will be in vain. As a result of the assessment, the management should be able to convince more

people of the shortcomings of their organization. Planning how to overcome the organisation, weakness is key to getting support for their project and securing the funds they need. There are several ways to present this technique as a series of related projects, each addressing the specific identified needs during the evaluation.

The guide can span months or years and highlight important precautions and circumstances In the early stages of a project, a good advisor can help an organisation achieve successes by giving you more support for the next steps. Continue to evaluate and update the guidelines as financial conditions and business drivers' change.

The exercises you have done in the past will surely give you deeper knowledge that you can apply in your future endeavors.

Implementation

If an organisation is to be successful, it needs a lot of human and financial resources. Get ready for the long haul, but make sure to move slowly and applaud. As long as building programs are viewed as valuable and useful, there should be no protection from constantly pumping them. All in all, this is a great opportunity to bring it all together. An organisation should have a clear idea of what they want to achieve (Samuel 2020).

The organisation should solve social problems in a mature way. With a cycle and progression that empowers and guides their insights, the management agenda is a huge plus for them Knowing where the holes are and how to fix them is a good. Keep short-term gains in mind during the course. Without them, their program could lose momentum and support key stakeholders.

Step 8: Measure and Improve the Knowledge Management Program

An organisation should be careful about getting reasonable results when choosing the right metrics to measure the company's progress (Zakariyah et al., 2020). The main reason for creating a CEO score is to

give the organisation valuable insight into what is working and what is not. If so, the necessary steps could be taken to resolve inconsistencies related to the consistency, execution, quality of

the management program and its value.

2.1.6: Theme 4: Enhancing the Processes of Palm Oil Extraction Practices in an Eco-Friendly Way:

Culture/Past and Current

In the past and even to date the Oil Palm Trunk (OPT) and Oil Palm (OPF) are two lignocellulosic materials that can be harvested after the oil palm has been transplanted and pruned this method is used as it is believed to be eco-friendly, in most countries around the world where palm oil extraction is done (Guiriba, 2020), natural palm product packages are often used as palm oil mulch or compost prepared to increase soil fertility, such as palm leaf brush and medium-thickness fiberboard, (Ahmadu, 2017), the modified palm fritters are often used as feed for farm animals and chickens in palm oil producing countries around the world, which is also believed to be eco-friendly ways of saving the planet, (Lwoga et al., 2020). The storage and care of nutrient-rich animals, such as the use of hand extractors, can lead to lean meat with 75.8 percent absolute dietary supplements and energy requirements for the metabolism. The palm oil plant grows worldwide and needs to be looked after. There are several eco-friendlier ways hopefully yet undiscovered it can be used in the future in different countries.

Structure/Past and Current

The palm oil trees **(See appendix 7**) can grow rapidly in West Africa rainforests as well as in the Asia-Pacific, Latin American, and Caribbean regions. Oil palms are becoming increasingly popular around the world (Chukwu, et al., 2020). As in West African countries with small farmers who only have a fixed number of rural products on their fields, these are harvested in an environmentally friendly way (Esan and Ojemola, 2018). Palm oil (stearin) from palm tissue and

palm oil (olein) from palm kernels are responsible for the development of these properties. According to estimates from 1997, palm oil plantations covered 6.5 million hectares and produced 17.5 million tons of palm oil and 2.1 million tons of bituminous oil annually. 30 million tons of palm oil are distributed over 12 million hectares. Of the total area in Nigeria (5.3 million ha) it is 4.3 million (Ahmadu, 2017).

People Skills/Past and Current

In terms of people skills Nigeria is developing the fastest people skills when it comes to converting forests to palm oil production (Esan and Ojemola, 2018). The palm oil plantations grew many times over in the 30 years between 1967 and 1997, with the annual production of raw palm oil increasing by an average of 12%. The area increased from 106 thousand in 1960 to 6 million in 2006, with around 18 million of forest area being cleared for palm oil production in 2006. As part of the Kalimantan Border Oil Palm mega-project (Lwoga et al., 2020), a Nigeria government agency announced new plans to convert an additional 3 million hectares of Borneo land into palm oil plantations, including 2 million hectares of palm oil plantations in Nigeria, (Okiki and Alabi, 2019).

Palm oil supporters say their products reduce unemployment, alleviate poverty, and offer natural benefits. The director of the International Finance Corporation (IFC) said oil palm owners in Côte d'Ivoire and elsewhere will do more business and create higher expectations for everyday comfort and improve rural development in individual countries, (Guiriba, 2019).

The main reason the palm oil plantations continue to expand, despite their negative human and environmental impacts, is simply that they bring significant benefits to ranchers and provide financial support from national and international sources. All these super advantages are secured

with little effort, low listing or rental costs, ineffective natural constraints, public attractiveness, support from multilateral and private foundations and a short development cycle (Yadav et al., 2020). In Nigeria, for example, palm oil exports oil is one of the country's strategic advantages in the world market and has contributed to the country's economic development. Nigeria received over US $ 2.1 billion in palm oil export revenues (Yadav et al., 2020). Nigeria palm oil producing areas also benefits from government support as the collections are primarily for the ticket market, creating an unknown trade (Erinoso et al.,2018). The growing demand for biofuels as well as the demand for carbon dioxide sinks and the organisation of the trade in fossil fuel waste are new reasons for the expansion of palm oil cultivation in Nigeria. Excellent return on investment per hectare and low production costs make it the most widely used renewable energy source today (Lwoga et al., 2020).

There was a more market-oriented policy proposed in the Kyoto Protocol on climate change with regards to palm oil farming and extraction, this was rejected as the Climate Change Convention as it took a fairer and more natural approach to addressing the causes of global temperature rise (Esan and Ojemola, 2018). During this time, the enlarged states (38 industrialised nations) committed themselves to reducing their outflows of pollution by an average of 5.2 percent below the level of 1989, to buying “carbon credits” from less polluting countries or companies and to investing in projects that “capture” or “store”. Carbon emissions by 2012, where none of the three configurable market solutions address the real causes of global warming: the transfer of non-renewable energy sources from underground storage facilities where they migrate away from the climate and into the atmosphere (Lambin et al., 2018).

The EU (European Union) strongly encourages the use of biofuels which is gotten in abundance from palm oil as an energy source for transport that can be used in place of fossil fuels by 2010, 5.75 percent of European transport fuel should come from biofuels and by 2020, 20 percent of petrol should come from biofuels, when President Bush delivered a speech to the state in February 2006, he said that by 2020, 30 percent of the country's cars will use bioethanol. This was the second time President Bush made this announcement (Lwoga et al., 2020).

The direction of sustainability is more important than ever as large companies like the palm oil sector grow and become more advanced every day. The main social, environmental and economic problems related to palm oil production have been briefly discussed in the previous chapters, but this overview does not sufficiently cover the complexity and interdependence of the sector. With the increasing size and complexity of the area and the associated challenges, the interdependence between the state, the private sector and society as a whole also grows. In environmental management, for example, an overarching framework has emerged in which various artists try to forge alliances that, give legitimate concerns, overlap different ways of interacting with the government in order to meet the increasing demand from management for manageable palm oil events (Adeniran et al., 2020).

Ajayi et al., (2020), gives an example of a cross-framework as the “palm oil program for people” in which the Edo State local government of the Ologbo Ikpoba-Okha region has expressly decided to give land to cheap contracts for palm oil farms in which people can work as part of a public association with the nearby NGO (Onyeneke et al., 2017). While this particular strategic plan of “unification” has not been successful it is a successful attempt to connect

indigenous oil palm owners to the globalised palm oil markets (Kayode et al., 2017). These changes and the overall outcome have drawn the attention of several organisations such as the WUR Oil Palm Escalation Group and WWF, who are working hard on its validation, which are great examples of new forms of development management.

The Nigeria government appears to have been saved from another role in these new forms of governance in palm oil extraction activity due to changing events around the world. In the past it was assumed that government agencies or organisations would naturally find ways to meet the growing demand for administrative palm oil business services (Samuel, 2021). The palm oil administrations by businesses have shown, however, that they are reacting successively to these new administration requests to promote eco-friendly palm oil extraction practices.

Eco-friendly palm oil extracting method is giving rise to a variety of innovative responses on the part of those who understand that the conventional response of relying on government is unlikely to serve them well in meeting the challenges of governance arising from human-environment interactions in an era of human-dominated ecosystems".

RSPO, a non-profit industry association, is an example of a creative response to unfair practices in the palm oil sector. RSPO uses a "multi-partner strategy" to monitor unfair practices in the palm oil sector (Mohsin and Syed, 2018). Scientists say that industry dominates this relationship (Kayode et al., 2017), whereby smallholder farmers play a subordinate role in the overall dynamics of the system (Jellason et al., 2021). The RSPO and its implications for smallholders are briefly discussed in the next section.

Knowledge Creation/Past and Current

Implementation of the Nigeria decentralisation law no. 22 and 25 gave local governments the opportunity to play a role in promoting the financial turnaround of events and reflecting more closely on the wishes and support of citizens (Kankara et al., 2018). As a wealthy place, unlike other districts, Ologbo in Ikpoba-Okha raised a significant amount of money through monetary decentralisation, these funds are earmarked for reserves, and the Ikpoba-Okha region government has generously used part of this budget to directly engage the local economy through the development of private residences (themselves), as exemplified by the Palm Oil for People program. In 2003, the Ikpoba-Okha local government launched the Palm Oil for People Initiative, the program has since been expanded to other parts of the region, this initiative came about as a reaction to the plight of the underestimated indigenous population of the Ologbo people ethnic group, who at that time lived in devastated areas between palm oil and wood plantations (Forutnani et al., 2018).

Socialisation/Past and Current

The small landowners came up at regular urban meetings in the coastal region of Ologbo in Ikpoba-Okha, where landowners expressed their support and the Ikpoba-Okha Group responded with a palm oil fence, which formed the framework for the Palm Oil for People initiative. according to (Issa et al., 2018):

The scheme developed a land inventory and set out to verify land ownership through village meetings. To avoid corruption of the list of those entitled to oil palm smallholdings, after repeated verification in the village, the list was given legal status with the proclamation of a District Head's decision" (Igwe et al., 2018).

Several areas of land that were in conventional (local) ownership (adat) were classified as "empty" state land because the president required precise guidelines and data on unavailable land

(Ebu et al., 2021).

Combination/Past and Current

Since a considerable part of the Ikpoba-Okha people land owner property was assigned to a real estate concession, it was stated that the project should require a considerable amount of urban land, whatever the reason, the region still couldn't get enough land for the project, this led to the exclusion of several villages from the plan and to the separation of the participating villages from a smaller area of land than originally planned (Ebu et al., 2021), despite the land problems in this plan, the ranch development was used by the local government of Ikpoba-Okha as a strategy to generate new business income, create and expand jobs, and provide state aid to the citizens (Wahab and Popoola, 2019).

Externalisation Past and Current

In an effort to offset previous programs that had tied palm oil farmers in the Ikpoba-Okha area, the local government backed giving its loans to smallholders from the region's financial plan by requiring members to pay only a significant portion of the cost of business loans, (Ugwuanyi, 2018). Palm oil companies are established by the local government on private land in the region on land owned by the people. According to the estate plan, the total area is 3,500 hectares, divided into 1,156 families with three hectares each (Roberts and Okereke, 2017).

Internalisation/Past and Current

The non-governmental organisation (called Perkumpulan Elang (Oyeyemi et al., 2019) was selected to present the program in Ologbo Ikpoba-Okha local government and to make the local population aware of the importance of (sustainable) palm oil production.

KM Intermediate Outcomes/Past and Current

Although the Palm Oil for People program was officially launched in 2003, it started in the in 2002, when local authorities visited seven cities to interact with local people, mainly to raise awareness and support the program Ebu et al., 2021).

Organisational Performance/Past and Current

In the case of the Ologbo residents (a well-known artist in the locality) was used to convince the residents to support the initiative of using most of the local lands to grow palm tree farms and in 2004 the townspeople agreed to bring the palm oil program to Ologbo and this helped to increase the local government performance, the Ikpoba-Okha ranch was ready for its first harvest in 2008 when lands were donated to the people of the surrounding area (Oloko et al., 2017). Due to the way in which national development plans have long dominated the Nigerian fabric, after initial refusal by the Ologbo residents, the Ologbo residents have now demonstrated their ability to accept these changes which led to the overall success of the access plan, however, few villages in the area having experienced Ologbo level of excellence when the program was implemented agreed to follow in this path of palm oil farming.

Summary

Palm oil farming is not alien to Nigeria, it has been in existence over 2,500years (Mali et al., 2018). There have been disappointing results in palm oil farming in Nigeria in Ologbo mainly due to lack of proper information data, (Igwe et al., 2018) but currently the Nigeria agriculture Ministry support farmers with such information.

Most of the skills needed by most palm oil farmers in Nigeria for extracting palm oil is learnt from observing others or passed down through words of mouth, (Chendov, 2018). In Nigeria most palm oil farmers still use the traditional extracting methods, although some SMEs and medium size palm

oil farmers combine both traditional and machanised ways in doing palm oil extraction, (Yulianti et al., 2018).

According to (Chukwu et al., 2018, most palm oil businesses are family businesses, A lot of palm oil farmers in Nigeria including SMEs and the medium size businesses have their own individual or company models they use in running their businesses, (Makate, 2019).

Most SMEs and medium size palm oil farmers use a combination of traditional and machanised system in their palm oil processing in Ologbo Ikpoba-Okha, (Ebu et al., 2020).

The skills needed by most SMEs and medium size farmers in palm oil extracting can be learnt or taught at their place of work by observing or manual handling under supervision, (Abdulkadir et al., 2017), several SMEs and medium size palm oil farmers in Ologbo Ikpoba-Okha, tend to extract between two hundred to three hundred kilograms per tons, (Ogar et al., 2020).

The technology used for palm oil extracting has improved, as a result a lot of SMEs and medium size farmers are now combing machinery to traditional method of palm oil extraction,

Well organised palm oil farmers such as SMEs and the medium size farmers of recent have improved their production of palm oil and this has led production increase and increase in their company performance, (Majekodunmi, 2018). A well planned and carried out palm oil extraction process is one of the most important steps in improving the business performance, (Suurshater et al., 2019).

In order to develop and maintain a sustainable way of palm oil extraction, land corruption will have to be tackled, (Owolabi, 2018), because most palm oil farmers tend to combine practices such as floodplain horticulture, a method that tend to cause too much use of water in the

extraction of palm oil process, (Lawal et al., 2020). Deforestation is also one of the greatest threats to sustainability of palm oil extraction (Ior et al., 2017).

Nigeria is one of the countries in recent years developing the fastest when it comes to palm oil farming in recent years, (Lwoga et al., 2020), Palm oil trade supporters believe that with the new rise in palm oil farming again in Nigeria it will help to reduce youth unemployment, (Okiki and Alabi, 2019).

In Ologbo Ikpoba-Okha in order to create knowledge and support palm oil farmers to carry out eco-friendly palm oil extraction practices the local government raised significant amount of money through decentralisation for local farmers, (Kankara et al., 2018). also, in 2003 the local government then developed an initiative to support the local farmers to promote eco-friendly extraction practices, (Forutnani et al., 2018).

CHAPTER 3: METHODOLOGY

3.0: Introduction

The researcher in the first chapter of this research looked at the research issues, problems, research aims and objectives and the scope of the research which is Ologbo in Ikpoba-Okha of Edo State Nigeria. The first chapter of the research also Summarised the key findings in the research and implication of the research to practice and its contribution. In this second chapter of this research work, the research looked at KM in relation to indigenous practices and also developed a theoretical framework for the research using the (Lee and Choi 2003) Enabler framework, this Enabler framework was also used by the researcher to do a systematic literature review section using an adapted Prisma literature review chart. The researcher also used the Enabler framework to address the research aims and objectives by dividing the literature review into four themes.

The methodology section is divided into different sub-sections such as research design and philosophies used for this research, the researcher strategy and approach used, data collection methods used, participants description and transcript and data analysis procedure.

3.1: Case Study

The researcher in this research used case study, as this method, enabled the researcher in formulating her research questions, and enabled her collect a comprehensive and enabled the researcher to also develop her analytical power, thereby increased her knowledge of the research subject.

According to (Yin, R.K. 2009) a case study is used by researchers to describe, explain and explore phenomena or events that occur in everyday life, to help to give an understanding and explain the links and pathways resulting from the research. The researcher used case study to understand the historical phenomenon of palm oil extracting in Ologbo Ikpoba-Okha, how indigenous (traditional palm oil farmers) and Medium and SMEs (contemporary palm oil farmers) did palm oil extraction in the past and current.

Justification for Using Case Study

- By using this case study method, the researcher was able to get additional insight into the gaps that existed in the research and it also helped the researcher to develop theory and create a framework as shown in the research (Enabler Framework by Lee and Choi 2003).
- The case study strategy enabled the researcher to do a holistic review of the researcher, the researcher was able to use a range of tools to look at the research topic in-depth (Yin, 2009).
- Using case study also helped the researcher to capture a range of perspective as opposed to one perspective (Yin, 2003b)

3.2: Research Design/Research Strategy

In this section, the design, structure and organisation of a logical or measurable effort is mentioned. The research design used for this research is qualitative research. A research design will efficiently guide the researcher through her research and set the framework that was used to conduct the research. This section is mainly concerned with the scope of information collection, the tools to obtain it, how these devices are used to collect information, and how the information

obtained is broken down and organised into a useful structure (Delabre and Okereke, 2020). Using research design, the researcher was able to formulate the research objectives and complete the research to find a solution to solving the research objectives/problems by gathering the appropriate knowledge (Purnomo et al., 2019). When trying to research the topic of the research, query configuration is key to the process. The design will determine the information gathering, strategies used in this research.

3.3: Qualitative Research Design

The research design chosen for this study is qualitative, (Syahza, 2019), said, qualitative research method is generally used for understanding views and perceptions, it offers visions to different problems and helps in developing concepts of theories for potential research.

Also, (Lim and Biswas, 2019) said qualitative research is an open and intelligent way of carrying out research that gives perception first to the researcher. The researcher chooses qualitative research design as the activity related to this kind of design will help a researcher to develop and improve the research questions, it also enabled the researcher to formulate research questions, identify and managing validity risk in the research. Using qualitative research design will enable the researcher to evaluate or revise the decisions made during the research in light of any new developments or changes elsewhere in the research plan.

Qualitative research also enabled the researcher to give a unique insight of understanding what is difficult to gain from a closed question survey and for participants to be able to freely disclose their experiences, thoughts and feelings without constraint.

According to (Brondízio et al., 2021), the concept of information is one of the most interesting differences between qualitative and quantitative research techniques. It's also one of the most difficult to define. Qualitative research analysis is tender, rich and deep (Rizal et al., 2018.). The intuition of qualitative research design is also said to be enhanced (Lim and Biswas, 2019) According to (Dharmawan et al., 2021), the concept of knowledge required through qualitative research is rich and profound so that the research most times agree with the researcher's point of view. This wealth of information will enable the researcher to distinguish between the current activities of the Spiggle 1994 model that may be reflected in the research.

Justification for using Qualitative design

- The researcher for this research used qualitative research design as it helped her to develop methods which she used in constructing her research questions (Brondízio et al., 2021).
- Qualitative research can help to address questions relating to social experiences in which it occurred, (Dharmawan et al., 2021) in this case is addressing historical perspective of palm oil extraction practices in Ologbo Ikpoba-Okha.
- Because qualitative design is good at studying occurrences within an environment or a place (Rizal et al., 2018) this strategy enabled the researcher to be able to study and understand the indigenous and contemporary methods of palm oil extraction practices in Ologbo Ikpoba-Okha community
- Qualitative design enabled the researcher to provide a robust insight into actions that occurred (Dharmawan et al., 2021), in palm oil extracting process and preserve the intending meaning from the view point of the farmers.

Process of Research Design

The research cycle for this research looked at the formulation of the research problem; by drawing up a starting plan on the type of questions to be asked and the expression technique to be used was determined. According to (Dharmawan et al., 2021) These are perhaps the most important research plan tactics to implement.

For this research design, two people at any given one session was involved throughout the interview stage:

An interviewer who is the (researcher) conducted the interview and asked the participant questions. The researcher used Zoom to conduct the interviews. According to (Kurz, 2021), the Internet is also becoming increasingly popular when it comes to organizing interviews The researcher used Zoom interview as is also a great way to gather information's about the opinion's thoughts, experiences, and feelings of people inside and outside an organisation. According to (Contreras-Medina et al., 2019), Interviews are useful when the subject of the application is facing problems that require complex problem solving then Face-to-face interviews are useful also when the target group can communicate more effectively through face-to-face conversation than through written or telephone interviews e.g., children, the elderly, or incompetent people.

3.4: Research Philosophy

Munasinghe et al., 2019, defines research philosophy as a broad approach to solving research problems, rather than a methodological plan, scientific perception assessment and challenge intended to challenge the deep-seated and often misleading assumptions on which further research is based.

Ontology

Understanding ontology helped the researcher to recognise how certain she can be about the philosophical perspective of how palm oil extraction was done in the past (traditional way) and the current (contemporary way) used by farmers in Ologbo Ikpoba-Okha of Edo state. According to (Issa et al., 2018) ontology will help the researcher to prove that reality depends, among other things, on implications and understanding on a friendly and knowledgeable level.

Epistemology

By assuming the methodology that people cannot free themselves from their understanding, there is a reasonable relationship between the researcher and the research participants. The application of the interpretative method in research is accompanied by standards established by the International Organisation for Standardisation (Asmani and Ekadinata, 2019).

Interpretivism

interpretativeism is often accurate and reliable, relevant information and researches using interpretivism are often associated with an undeniable level of validity. If the researcher follows the theory of interpretative research in their work, the depth of the discussion of exploratory arguments will largely be determined by the scope of the research if interpretivism is used**.** (Munasinghe et al., 2019).

In interpretativeism, metaphysics and epistemology are believed to be intertwined because information (extraction, implications) are so important for ontological assumptions about the structure of the universe that they have to be considered together (Bhushan et al., 2018).

For this research the researcher also used Interpretivism as part of her research philosophy, also called interpreter, as this offered the researcher the professional help in deciphering and understanding the research (Teng et al., 2020). Interpretivism helped the researcher to integrate the participants responses with the research. Interpretivism assume that access to reality (given or

socially constructed) is only through social constructions such as language, consciousness, shared meanings, and instruments (Teng et al., 2020).

The purpose of this section is to show that the researcher is taking an interpretive approach and embodiment of interpretivism technique used.

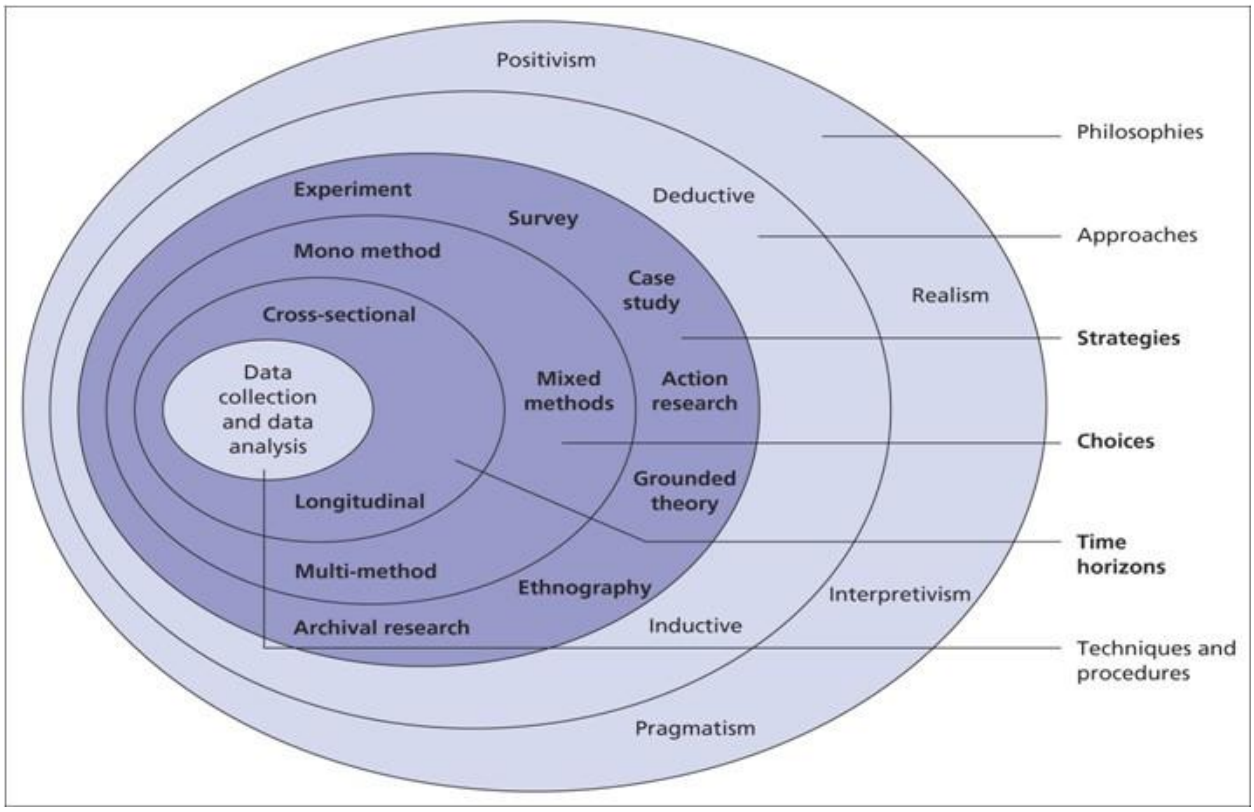
The researcher used interpretivism to emphasize the importance of the research issues and also used different techniques to present different answers to the research questions asked.

Justification for using Interpretivism

- The researcher used interpretivism as it helped the researcher to understand each participants experience and unique situation (Teng et al., 2020).
- The researcher used interpretivism as it is based on participants reality and experiences. (Munasinghe et al., 2019).
- Interpretivism helped the researcher to obtain first person accounts of their experiences and helped the researcher to search to get underlying meanings of experiences and explanations. (Bhushan et al., 2018).

Fig: 8: Graph of Research Onion Theories and Philosophies

(The research onion (2018) Mark Saunders, Philip Lewis and Adrian Thornhill)



The interpretative approach is used for this research because it is a naturalistic method of gathering information. Using interpretativeism helped the researcher search and find answers to research question before the end of the research cycle.

interpretivism depends on the following beliefs, namely:

Interpretivism in Qualitative Research

According to (Rizal et al., 2000) Interpretativism is undoubtedly not a uniform practice and is unambiguous and there are many different forms of interpretation to choose from, he distinguishes several variants, including conservative, constructivist, and fundamental constructivist approaches.

Rizal et al., (2000) went further to say the technique of deconstructivism is in many ways similar to interpretivism, this type of research methodology does not focus on the traditions of interpretation of information systems an underlying pattern but can be viewed as an appropriate separate practice within Interpretivism research (Degli Innocenti and Oosterveer, 2020). This research focuses on phenomenological practice. In addition, the researcher goal is to collect a common ideal set of information using interpretivism.

Using an interpretive view, the researcher will understand the abstract meanings of participants interview in the areas under consideration to critically analysis the data collected.

3.5: Phenomenological Construct

The researcher for this research used the philosophical perspectives of phenomenology in order to properly organise the research path. The term phenomenology is derived from the Greek words phenomenon (appearance) and logos (logos means study). Phenomenology is a term that refers to the planned study of the concept of manifestation (Segun et al., 2018). Edmund Husserl (1859-1938), a German mathematician and philosopher who is often referred to as the "father of phenomenology", was the first to use the term "phenomenology". In the context of the philosophical social sciences, phenomenology treats people and their conscious experience as the main subject of research and tries to break away from previous assumptions, prejudices and other forms of obsessive thinking through the study of social behaviour (Rahman et al., 2017).

Justification for Using Phenomenology

The researcher used phenomenology as it takes into account common sense, conscious encounters and routines in everyday life and tries to understand the world from the perspective of the Indigenous and contemporary palm oil farmers, (Segun et al., 2018).

According to (Fitchett and Ebhuoma, 2018). Phenomenology is the study of the design of a conscious experience as viewed from the original individual perspective and the associated states of participation, the researcher asked participants questions intending to get answers on their perspectives based on their palm oil extraction practices in the past and current methods,

the researcher also used common sense to pick queues from participants during interviews on what they say and don't say sometimes from the way they answered questions, how their daily life routine, work influences and business when it comes to palm oil extraction, as phenomenology is a strategy of a logical analysis tool, it enabled the researcher to have subjective experience of social amusement as a result of its logical analysis tool (Olusegun, 2019).

As for the information gathered by the researcher such as age and direct connection with participants, the strength of using phenomenology enabled the researcher's ability in carry out the research, the direct communication via zoom with the researcher and research participants enabled the researcher to ask questions and seek clarification as well as to receive information as quickly as possible (Odok, 2019).

Using phenomenology for this research helped the researcher to identify non-verbal responses that agree with or contradict the observed verbal responses, (Ademowo and Nuhu, 2017), phenomenology as a method has four characteristics, which include clarity, decomposition, content and intentionality.

3.6: Different Research Strategies

Difference and similarities between multiple approaches

(Source: Arnold and Lane, 2016)

	Deduction	Induction	Abduction
Logic	In a deductive inference, when the premises are true, the conclusion must also be true	In an inductive inference, known premises are used to generate untested conclusions	In an abductive inference, known premises are used to generate testable conclusions
Generalizability	Generalising from the general to the specific	Generalising from the specific to the general	Generalising from the interactions between the specific and the general
Use of data	Data collection is used to evaluate propositions or hypotheses related to an existing theory	Data collection is used to explore a phenomenon, identify themes and patterns and create a conceptual framework	Data collection is used to explore a phenomenon, identify themes and patterns, locate these in a conceptual framework and test this through subsequent data collection and so forth
Theory	Theory falsification or verification	Theory generation and building	Theory generation or modification; incorporating existing theory where appropriate, to build new theory or modify existing theory

Choosing the most appropriate research method for your research point and goals is key to success. According to (Ruysschaert et al., 2019) there are several test systems, including questionnaires and tests; Context research; Ethnography; reasonable assumptions, transverse and longitudinal reliefs, Company search; as well as searching and retrieving information. According to (Papilo et al., 2018), the different types of tests include reliable, exploratory, insight and prognostic tests, applied and in-depth tests, quantitative and subjective tests, and deductive and inductive tests, before deciding on a particular test procedure, you should carefully evaluate all available test approaches.

Padfield et al. (2019) demonstrated the need to present research technique as a compelling way to increase the legitimacy of social research.

3.7: Inductive Approach

The researcher for this research used the inductive approach, the inductive approach is a style of thinking in which the researcher moves from one unique reality to another in order to achieve a normal goal (Dharmawan et al., 2021), however, this does not guarantee the validity of the arguments or the solution of the goal, the same principle applies to actual claims, where reasonable grounds can lead us to a fictitious conclusion. The researcher in using inductive thinking used single sentences during interview of participants and translates them into a large number of general statements, inductive thinking is the process of converting an explicit sentence into a more general structure (Dharmawan et al., 2021).

The researcher in using inductive approach used it for efficiency, by breaking it down into two sections: strong induction and weak induction, strong inductive means realities are based on articulation principles but in this case, they will not confirm reality, the researcher need to be sure or clear that the goals are true due to the essential nature of the assumptions, but there is no guarantee that they will be 100% accurate (Dharmawan et al., 2021), such as looking at the historical perspective of palm oil extraction in Ologbo Ikpoba-Okha, if the traditional methods of palm oil extraction used by the indigenous farmers is better than the methods used by the contemporary farmers, the findings from these questions are supported by confirmations obtained through inductive thinking.

For example this legitimate speculative question “if indigenous palm oil extraction processing is better than contemporary extraction practices?” will be a solid and reliable question for the

researcher to ask the research participants and help the researcher to confirm the researcher ideas and belief, If the questions are not confirmed or inductively used, it will be a disadvantage to the research questions asked. Inductive approach helped the research to acceptance of newly formulated questions that are corroborated by supporting evidence collected during the research.

Justification for using Inductive Approach

- The researcher used inductive approach to develop her research theories, structure in the research and the research processes used, (Munasinghe et al., 2019).
- It helped the researcher to have clear links between the research objectives and the summary findings, (Dharmawan, 2021).
- Using inductive approach helped the researcher to condense extensive rax data text into brief format, (Brondízio et al., 2021)
- The inductive approach enabled the researcher to focus on each individual participant's experience, (Rizal et al., 2018).

3.8: Type of Interview Used

Semi-structured Interview

There are different types of interviews, for this research the researcher used semi-structured interview. Semi-structured interview helped the researcher to analyse in-depth interviews, react superficially during the SSI in order to arrive at complicated final results (Khatun et al., 2020).Using semi-structured interview methods if the questions are not confirmed or inductively used, it will be a disadvantaged to the research questioned asked.

using this interview method for this researcher the researcher was able to track most events,

including all verbal and non-verbal emotions such as premonitions, laughter, and silence, to discover stored data that helped in the final evaluation of information about various conversation problems (Hasanah et al., 2019).

Justification for Using Semi-structured Interview

- Using semi-structured interview enabled the researcher gain flexibility for this research, the researcher was able to integrate various topics into the questions asked. (Khatun et al., 2020)
- Using SSI, the researcher was able to examine different points with different topics. Additionally, the intuitive nature of SSI allowed the research participants to express themselves uncensored (Dharmawan et al., 2021).
- In addition, several research experts have suggested that encouraging the subjective investigation of information with a personal computer with adaptive coding, when applied to all coded subjects, could result in a reliable search from a huge (more than 30) test language, (Khatun et al., 2020).
- In addition, the generative idea of SSI enabled the researcher to generate innovative proposals that can be implemented. The researcher (interviewer) asked series of predefined questions and the participants answer in ways that seems natural to them through either face-to-face or zoom conversation as used by the researcher (Bose, 2019).
- To ensure that all participants are asked the same questions and are given same information, the research participants were divided into two groups indigenous palm oil farmers and contemporary palm oil farmers (Khatun et al., 2020).
- According to (Bose, 2019). The interviewer can explore areas that depend on the participants' answers or ask questions that can be clarified. In situations in which it is

necessary to methodically collect internal and external data from different participant's or interviewers, semi-structured meetings are useful, (Ayompe et al., 2020).

- According to Nesadurai (2018), the use of less essential thematic codes during semi-structured interview will increase the likelihood that the coding on hundreds or thousands of pages of information will be robust and meaningful. In other words, the interaction allows researchers to spend more time developing and discussing ideas and linking them to information than they would otherwise clean up line by line and merge scripts (Bose, 2019).
- The reality of the topics during the SSI are recorded in the typical structures of their subjects. Ideally, a pleasant SSI relies on the interviewers 's voice when both parties (researcher and participants) are dynamically involved, as is the case worldwide (Bose, 2019).

3.9: Data Collection Method

Primary Data

Data used for this research was both primary and secondary data (mixed) techniques to gather the necessary information. Using the primary data collection method, the research was able to collect exact and current information's concerning palm oil extraction processing directly from the research participants (Magni, 2017), although this primary method of data collection was time consuming and very tedious, but the researcher chooses this method.

The chosen population for the research were 40 palm oil farmers from Ologbo in Ikpoba-Okha which were 20 locals indigenous (traditional) palm oil farmers and 20 SMEs and Medium

(contemporary) local palm oil businesses who volunteered to be interviewed using Zoom, participants were purposively selected by local representative in who lives and is familiar with the area.

Justification for using zoom and telephone technology to collect Primary Data

The researcher chooses to use zoom to collect primary data through interviews due to the pandemic criteria, the scope of the interview which was in Ologbo in Ikpoba-Okha during data collection stages of the research was put on a red list (meaning high covid contamination cases) as a result researcher could not travel to Nigeria for primary data collection.

Using zoom although there where issues at time with poor network connections and there were occasional cancellations as a result of poor network it also benefited the research set objectives without being biased as each research participants was interviewed individually (there were no two participants interviewed at the same time, so participants were able to speak and express themselves freely, according to (Heriyanto et al., 2020), using this method of data gathering is also an accurate way of collecting data. No participant was under duress at any point in time during the data collection interview.

All participants interviewed both from the contemporary and indigenous farmers side were not paid to be interviewed.

Information regarding the research topic, aims and objectives was sent to research participants weeks before the interview took place to understand what the research was about.

The phone used by participants to speak to researcher from Ologbo Ikpoba-Okha was a mobile phone, owned by the local representative who gave the phone to each of the participant during the interview sections and waited outside for privacy reasons for the interview to be conducted.

There was no need for an interpreter during the interviews as the participants spoke and understood English Language and the minimum qualifications of the participants interviewed was Primary school leaving certificate and English language is an official language spoken in Nigeria.

All interviews were recorded with participants consent and both interview tapes and hand transcript taken by researcher for interview was kept secured in computer used only by researcher and kept under lock and key.

Secondary Data

According to (Khatun et al., 2020) secondary data is the data that has already been collected by someone else for another purpose and relevant to aid the research. Secondary data was also used for this research, because of the ease of access and time saving method of gathering the information for the researcher and the researcher was able to use the secondary data to do longitudinal research on the research topic (look back on researchers done over time on palm oil extraction in developing countries). The researcher also used secondary data for this research as it was less expensive method apart from frequent travels to the library. these data were gotten some from past literatures that looked at palm oil extraction in developing countries and data collected from the local government archives sent through a friend in Ologbo (due to covid travel restrictions) looking at history of palm oil extraction in Ologbo Ikpoba-Okha. Because this research is qualitative most of the primary data collected were data used to find out what is happening, how and why. According to (Khatun et al., 2020). and (Magni, 2017), targeted data collection is based on the concept that information must be found, understood and procured, for

example, choose the example that will give you the most insight. In the next phase, the proactive methodologist examines the exam question according to the previously agreed disposition.

3.1.0: Triangulation

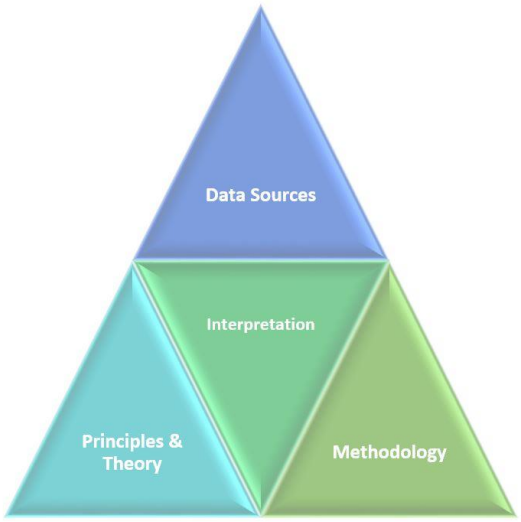
Triangulation in research is the use of more than one approach to researching a question, this is done in order to develop confidence in the research and helps to give a more comprehensive understanding, (Noble et al., 2019).

While, (Akutey et al., (2021) describe triangulation as the use of multiple data theories, methods and sources used within a research study to investigate a single phenomenon.

Both of these definitions are correct in describing use of triangulation in research, and there are many reasons to justify why triangulation is used in research and why the researcher used triangulation in this case study.

Figure 9: Adapted Map of Triangulation

(Five forms of triangulation, Miles and Huberman 1984, p234)



Triangulation

Justification for using triangulation

- The use of triangulation helps in the combination of research findings from two or more sources, it is a rigorous approach to provide a more comprehensive picture of the results of data used, (Noble et al., et al., 2019)
- Triangulation technique is used to confirm suggested findings and it can also be used to determine the completeness of data, (Williamson, 2005).
- Triangulation is most commonly used in mixed method research e.g. (Qualitative and Quantitative research), it is also used as a means to add depths to a research inquiry, (Noble et al., 2019)
- The use of triangulation in research helped the researcher to conduct in-depth interviews (Bryman, et al., 2015) with different stakeholders in the case of this research contemporary and indigenous palm oil farmers in Ologbo Ikpoba-Okha.

Procedure Used to Ensure Triangulation

Using triangulation, the researcher did a rigorous search by gathering data from different literatures of high quality, that looked at the research topic (Bryman, 2015), in this research indigenous knowledge management of palm oil extraction in Ologbo Ikpoba of Edo State.

The researcher also used data from multiple sources to be more certain of the data's credibility and trustworthiness using the university website (UWTSD) to help to get a more complete understanding of the research topic and problems, the researcher used numerous sources and data's as relying on one data may lead to bias or be disadvantaged by inherent flaws and limitations (Noble et al., 2019). Using triangulation, helped the researcher to increase validity of this research work.

3.1.1: Sample Selection Criteria

In conducting this research, the main task was to identify and define the specific population to be questioned. For example, it serves everything the general public needs, whether posted or not. The most difficult task in choosing an example is to characterise the population by an appropriate technique that ensures that the example is representative of the population and that the result of the information is in no way biased (Heriyanto et al., 2021). Since it is usually impossible to determine the actual size of the sample, an estimate was used. However, the researcher ensured that the delegated test is an estimate of the entire sample.

Before starting an investigation, the researcher should avoid presenting one-sided results, as this can change the result of the entire scenario under consideration. Several techniques can be used to design delegated questions to make meaningful assumptions about the reactions of the general population (Senawi et al., 2019). A fortuitous example is the interview technique that is most commonly used by some researchers. After the population has been differentiated, a delegated questions can be developed. Everyone in the population has an equal chance of being selected, and a decision on one item is not influenced by the choice of another item. In addition, a

different type of group question procedure is considered in the control process. In this case, the size of the example would encompass a group of people as a unit (Dharmawan et al., 2021).

3.1.2: Purposive Sampling

The researcher in this research used purposive sampling technique, the researcher chooses this type of technique because it is selective sampling, the purposive sampling technique helped the researcher to make the most of the small population used in this research to arrive at a valuable research outcome, this method of research sampling will also allow the researcher to gather qualitative responses which will give the researcher a better insight into the research and more precise research results, (Padfield et al., 2019).

Justification for using Purposive Samplying

The researcher used purposive sampling as it helped to save time and money when gathering the research data and using this method of sampling helped the researcher as it included every perspective of the data collected in relation to the research population. According to (Padfield et al., 2019).

Using purposive Samplying, helped the researcher creating a simple research plan. The researcher used her judgement to select and choose participants from the Ologbo Ikpoba-Okha community who are palm oil farmers and the researcher choose two groups (traditional palm oil farmers) Indigenous and (medium size and SMEs palm oil farmers) contemporary palm oil farmers from the local population that fits into the criteria for this research, such as their age group, similar type of job or business, the researcher used this method because she believes they she can obtain a representative sample by using these techniques (Dharmawan et al., 2021).

3.1.3: Participants Description

To put it more clearly, phrases, text fragments and images were separated in which the participants, the 20 local palm oil farmers and the 20 Medium and SMEs farmers were able to describe historical and current work practices, forms of work organisation, production processes among other aspects. Subsequently, the thematic trends were verified and the category name was adjusted according to the theoretical background of the topic.

The number of participants was adequate for the research, total number of participants was 40, participants was drawn from the Ologbo Ikpoba-Okha local government area of Nigeria, participants was drawn in terms of age, gender, type of palm oil farming they were engaged in (contemporary or indigenous) and how long they have been working in the palm oil sector in the community and the type of education or training they received or have this means saturation was achieved.

Representatives in the sample

Table 1- Description of Participants

S/N	Participant ID	Gender	Qualification	Position	Palm Oil Farming Experience	State of Origin	Age
1	Local Indigenous Farmer (1)	Male	WAEC (West Africa Examination Council) Secondary School Qualification	Palm oil Farmer Owner	30years	Edo State	50 and above

2	Local Indigenous Farmer (2)	Male	WAEC	Palm oil Farmer owner	40years	Edo State	50 and above
3	Local Indigenous farmer (3)	Male	WAEC	Palm oil farmer owner	28years	Edo State	50 and above
4	Local Indigenous Farmer (4)	Male	Primary School Leaving Certificate	Palm Oil farmer owner	20years	Edo State	40 and below
5	Local Indigenous Farmer (5)	Male	Primary school Leaving Certificate	Palm oil farmer paid worker	10years	Edo State	40 and below
6	Local Indigenous Farmer (6)	Male	WAEC	Palm oil farmer owner	35years	Edo State	50 and above
7	Local Indigenous Farmer (7)	Female	Primary school leaving certificate	Palm oil farmer owner	30years	Edo State	40 and below
8	Local Indigenous Farmer (8)	Male	Primary school leaving certificate	Palm oil farmer owner	42years	Edo State	50 and above
9	Local Indigenous Farmer (9)	Male	Primary school leaving certificate	Palm oil farmer owner	48years	Edo State	50 and above

10	Local Indigenous Farmer (10)	Male	WAEC	Palm oil farmer owner	40years	Edo State	50 and above
11	Local Indigenous Farmer (11)	Female	WAEC	Palm oil farmer owner	25years	Edo State	40 and below
12	Local Indigenous Farmer (12)	Male	WAEC	Palm oil farmer owner	40years	Edo State	50 and above
13	Local Indigenous farmer (13)	Male	Primary school leaving certificate	Palm oil farmer owner	43years	Edo State	50 and above
14	Local Indigenous Farmer (14)	Male	Primary school leaving certificate	Palm oil farmer owner	27years	Edo State	50 and below
15	Local Indigenous farmer (15)	Male	WAEC	Palm oil farmer owner	15years	Edo State	40 and above
16	Local Indigenous farmer (16)	Male	WAEC	Palm oil farmer owner	41years	Edo State	50 and below
17	Local Indigenous farmer (17)	Male	WAEC	Palm oil farm paid worker	15years	Edo State	40 and above
18	Local Indigenous farmer (18)	Male	Primary school Leaving certificate	Palm oil farmer owner	20years	Edo State	50 and below

19	Local Indigenous farmer (19)	Male	Primary school Leaving certificate	Palm oil farmer owner	20years	Edo State	40 and above
20	Local indigenous farmer (20)	Male	WAEC	Palm oil farmer owner	30years	Edo State	40 and above
1	Contemporary palm oil farmer (21)	Male	Master's Degree	Owner Medium size palm oil farmer	12years	Edo state	50 years and below
2	Contemporary palm oil farmer (22)	Male	Bachelor Degree	SME palm oil farmer	14years	Delta state	40 and above
3	Contemporary palm oil farmer (23)	Male	Bachelor Degree	Medium size palm oil farm owner	7years	Edo State	40 and above
4	Contemporary palm oil farmer (24)	Male	Master's Degree	Medium size palm oil farm owner	10years	Edo State	50 and above
5	Contemporary palm oil farmer (25)	Female	Master's Degree	Medium size palm oil farm owner	15years	Edo State	40 and above
6	Contemporary palm oil farmer (26)	Male	Bachelor Degree	SME palm oil farm owner	8years	Ondo State	40 and above
7	Contemporary palm oil farmer (27)	Male	Master's Degree	SME palm oil farm owner	8years	Edo State	40 and above

8	Contemporary palm oil farmer (28)	Male	Master's Degree	Medium size Palm oil farm owner	6years	Edo State	40 and above
9	Contemporary palm oil farmer (29)	Male	Bachelor Degree	SME Palm oil farmer	4years	Edo State	40 and below
10	Contemporary palm oil farmer (30)	Female	Bachelor Degree	SME Palm oil farmer	7years	Edo state	40 and above
11	Contemporary palm oil farmer (31)	Male	Bachelor Degree	SME Palm oil farmer	24years	Edo State	50 and below
12	Contemporary palm oil farmer (32)	Male	Master's Degree	Medium size palm oil farmer	30years	Ondo State	50 and above
13	Contemporary palm oil farmer (33)	Male	Bachelor Degree	Medium size palm oil farmer	5years	Delta State	40 and above
14	Contemporary palm oil farmer (34)	Male	Bachelor Degree	SME palm oil farmer	10years	Edo State	50 and below
15	Contemporary palm oil farmer (35)	Male	HND Higher National Diploma	Medium size palm oil farmer	6years	Edo State	40 and above
16	Contemporary palm oil farmer (36)	Female	Master's Degree	Medium size palm oil farmer	5years	Edo State	50 and below
17	Contemporary palm oil farmer (37)	Male	Bachelor Degree	SME palm oil farmer	10years	Edo State	40 and above

18	Contemporary palm oil farmer (38)	Male	Bachelor Degree	SME palm oil farmer	7years	Edo State	40 and above
19	Contemporary palm oil farmer (39)	Male	Master's Degree	SME palm oil farmer	3years	Delta State	40 and below
20	Contemporary palm oil farmer (40)	Male	Bachelor Degree	Medium size farmer	10years	Ondo State	50 and above

The approach used to analyse and understand the precise information gathered in this research paper is an important part of the overall work, from the point of view of (Haumba and Kaddu, 2017), the information inspection is an exact search for meaning among many facts and information, this enables researchers to deal rationally with ambiguous information and to pass what they have learned on to others (Khatun et al., 2020). Also, a sample size of 40 participants participated through a virtual interview due to the outbreak of COVID-19 through Zoom, in order to derive meaningfulness from the raw data, a qualitative substance analysis was also used in the study. According to (Bose, 2019) It is a sensory production effort to decipher the amount of textual material by distinguishing key topics and examples through careful research analysis review and consistency, it turned out that the researcher in using this technique would give a great insight to its ability to generate specific predictions (Contreras-Medina et al., 2019), the researcher took a qualitative approach to the study using three research methods, visualising information, retrieving information and translating the information used.

According to (Ayompe et al., 2020), the ultimate goal of research has been to present information and at the same time decipher, explain, understand and maybe even predict what will happen, also, from the point view of (Brondízio et al., 2021), a comprehensive and interesting research report provides sufficient presentation to enable the reader to understand the need for a translation and an appropriate translation to enable the reader to understand the presentation. The presentation of information thus determines the need for research, but the search also determines the need for additional information presentation (Kurz, 2021).

3.1.4: Transcript Analysis Procedure

Participant's consent was sought prior to the virtual interviews done, these interviews were done via zoom due to the covid pandemic travel restrictions and risk of infections. The interviews were carried out in English language making the need for translation not needed. The researcher listened to the interview recording for a long time to get more understanding of the participants views, after this the researcher then used the Spiggle (1994) data analysis to interpret the data and the NVIVO a computer aided tool (Usually used for qualitative research studies that helps to give a clearer insight into data) was also used to gain useful insight into the data collected, (Leech & Onwuebguzie, 2011). these were developed into themes and sub-themes to understand the research themes more.

3.1.5: Data Analysis

Thematic data analysis was used by the researcher in this research, (Braun and Clarke, 2006) describes thematic analysis as a method for analysing qualitative data that entails searching across a data set to identify, analyse and report repeated patterns.

Justification for using thematic Analysis

The researcher used thematic analysis for this research because it is a flexible and a good method for analysing qualitative data as it helped the researcher to seek understanding to experiences, behaviour, thoughts and patterns which occurred during the data collection (Saunders et al., 2015).

Using thematic analysis, the researcher was also able to use the data collected to answer the research questions, thematic analysis enabled the researcher to familiarize herself with the data collected, generalize initial codes, search for themes and also review themes and then produced the report (Braun and Clarke, 2006).

Many researchers describe how they handled the information they collect and find that any subcategory, view, topic, or translation that emerges from the information was discovered, explained, or recognized based on that information using thematic analysis, (Magni, 2017).

The researcher for this research also used thematic analysis to determine validity and draw conclusions on findings, according to (Contreras-Medina et al., 2019). Researchers use thematic analysis methods to organize information, determine validity, draw conclusive conclusions, and develop or confirm plausible plans and assumptions that reveal information. Example using thematic analysis, participants where asked:

Main theme: **How information was stored in the past by palm oil farmers in Ologbo Ikpoba-Okha**?

Most of them from the indigenous and contemporary farmers said information was shared by **words of mouth in the past** and the researcher was also able to develop further themes based on their answers, sub-themes where developed.

Sub-themes: Training to be given to (contemporary and indigenous) farmers

It was found that training on the use of IT system on Knowledge Management of storing and sharing of best practices when it comes to extraction of palm oil was not given to farmers (contemporary or indigenous farmers) by the government, other sub-themes were also developed by the researcher based on participants answers.

3.1.6: Categorisation

According to (Nesadurai, 2018), Categorisation is a major component of qualitative data which researchers use to group patterns observed in a data to give meaningful units or categories. The researcher used Categorisation in this research to help her organise statements, ideas and data obtained from the interviews to make meaning. Two categories of palm oil farmers where interviewed, medium and SMEs farmers (Contemporary farmers) and traditional farmers (local indigenous farmers)

Categorisation 1: (Local indigenous farmer 15)

Categorisation 2: (Contemporary Farmer19)

Outcome: Using Categorisation, the researcher was able to use information's obtained in an organized or categorized way according to the research objectives, during the encryption process, the information's collected by the researcher was classified. Coding used by researcher can be indicated by symbols also, (Nesadurai, 2018) and (Meijide et al., 2020) and (Magni, 2017) and (Lim and Biswas, 2019) all said that said using symbols provide a deeper and more useful

picture of the coding for the researcher, local Indigenous farmer **(15).** The researcher used categorizations as it helped the researcher distinguish between different types of codes, thereby provided a system for the researcher to go beyond identifying topics and working out unnecessary changes.

3.1.7: Abstraction

Abstraction helped the researcher to be able to pull out relevant information's from diverse information collected during the research to be able to classify and analyse the information and data collected (Rizal et al., 2018). The concept of categorization develops through reflection, using abstraction, the researcher was able to choose from the formulated questions with regards to the research objectives the questions to ask participants that will support the research objectives and also during the review of the interview transcripts (data collection process) all the many information gathered and identified are relevant and necessary information's needed to meet the research objectives (Brondízio et al., 2021).

Abstraction helped the researcher to consolidate the recently adopted classifications into broader and more appropriate categories. Enclosing more important categories in a smaller one and understanding that a unit of data is an accurate indicator of broader data, an example of that is limited information written in a (a curriculum vitae), (Magni, 2017). On the other hand, (Hasanah et al., 2019) said that abstraction will help the structure of a research that may appear unexpectedly during research, and the information may be considered significant.

3.1.8: Reliability

The researcher used exploratory research as this method of qualitative research is reliable and it gave the researcher a better understanding of the existing research objectives. Although the researcher used qualitative research, there is the issue by some researchers that qualitative research can be unreliable as it can have personal bias by the researcher and interpreting the data gathered by the researcher might not be verbatim description of what the participant said or meant and that the researcher might not be able to demonstrate thought process of the participant during data analysis and subsequent interpretations. Reliability is considered as the measure of the consistency of method of system used according to (Csikszentmihalyi and Larson, 2014). The researcher used different types of reliability measurement to measure the effectiveness and reliability of this research project and provided data in the research as well. Among the types of techniques, the researcher used to make sure that the research is reliable, was using **internal consistency** reliability method (Csikszentmihalyi and Larson, 2014), said this reliability measurement method is the most common method and used by most researchers due to its high effectiveness and multiple benefits altogether. However, this process of reliability only requires a sample data set for estimating the internal consistency reliability, this technique of measurement is efficient in terms of measuring how consistently participants respond to one set of question. For greater increase in internal consistency reliability, the researcher decided to add more than one question on each research objective. However, having a large sample size of 40 participants, did assists to offset the loss in reliability.

While some answers to questions asked were relatively easy to interpret (such as palm oil extraction procedure evaluation) others involve a certain degree of subjectivity that makes their interpretation especially difficult, such as intensity or the concept of quality. In any case, the interpretation and analysis process in qualitative research will always involves some degree of error. In the measurement of research question, for example, errors may appear in the interpretation due to both the participant condition, and the researcher's objectivity.

The idea behind reliability is that meaningful results should be more than a one-time finding and inherently repeatable, meaning other researchers must be able to perform the same experiment under the same conditions and generate the same results, as this will reinforce the results and

ensure that the research community generally accepts the findings (Dharmawan et al., 2021). Without this replication of the same result if the research is conducted by another researcher the research and investigation will not have met all the requirements for verifiability. The researcher in this research believes strongly if another researcher conducts this same research the results will be the same given the prerequisite essential for this research to establish the truth. For example, if conducting a quick response research, it is reasonable to assume that the methods used are reliable and will record real time and correctly. However, in many cases diligent researchers will take steps to minimize the chances of malfunctions and to take care of validity and reliability.

If we go to the other extreme, any research that uses human opinion will always generate discussion, for example, if other researchers rate certain aspects, as in this research, the researcher interviewed two groups, indigenous farmer (traditional) and participants from small and medium size farmers (contemporary) then the reliability of the research findings by some researchers might be termed compromised. Human opinion can vary widely between each other and the same individual can rate the same things differently depending on the time of day and mood. This means that these research findings for some other researchers might claim it will be more difficult to repeat and are inherently less reliable. Reliability is a necessary ingredient in determining the overall validity of a research or experiment and improving the strength of the results (Csikszentmihalyi and Larson, 2014).

3.1.9: Validity

The researcher must guarantee the quality of its research findings, not only because it will largely condition the validity of its conclusions, but also because of the importance such findings will have on the research area covered. The quality of the research findings depends on both its validity and its reliability. While validity expresses the degree to which the phenomenon of interest is actually measured, reliability (Magni, 2017) indicates the extent to which the same values are obtained when judging the research findings more than once, under similar conditions. The fact that a finding is very precise does not, however, imply that it is necessarily valid. Thus,

if two consecutive findings are made with a poorly data gatherings, the values or findings obtained will surely be similar, although totally inaccurate.

In this research, the researcher did evaluate the validity of this research findings by comparing it with those obtained by means of other similar research on palm oil extraction processes in Nigeria and in other developing countries, as a reference, the research findings is shown to be valid and reliable for the findings of the research objectives in this research.

When the research objective is focused on the reliability of the research findings, in a reliability study, the following aspects can be assessed:

Repeatability: indicates the extent to which an instrument provides similar findings when applied to the same person on more than one occasion, but under identical conditions (Magni, 2017)

Intra-observer agreement: its objective is to evaluate the degree of consistency with the findings when a researcher does it herself (Csikszentmihalyi and Larson, 2014).

Inter-observer agreement: refers to the consistency between two different researchers when evaluating the same findings in the same individual. (Csikszentmihalyi and Larson, 2014).

Concordance between measurement methods: when there are different methods used by the researcher for the same phenomenon, it is interesting to study to what extent the results obtained with both instruments are equivalent (Csikszentmihalyi and Larson, 2014).

3.2.0: Saturation

The researcher for this research used action research, action research is a form of collective introspective inquiry undertaken by researchers in social situations in order to improve the rationality and justice of their social or educational practices, as well as their understanding of those practices and of the situations in which they take place (Colmenares and Pinero, 2008).

According to (Latorre, 2007), saturation happens when the research process has no new information to discover in its data analysis process.

The researcher in this research reached saturation after analysis of interview data collected.

There are three types of action research:

Research - technical action, the purpose of which would be to make social practices more effective, through the participation of teachers in work programs designed by experts or a team, in which the purposes of the same and the methodological development to be followed are predetermined.

Practical action research implies transformation of the consciousness of the participants, as well as change in social practices. The researcher is a consultant of the process, participates in the dialogue to support the cooperation of the participants, the active participation and the social practices.

Critical, emancipatory action research incorporates the ideas of critical theory. It focuses on educational praxis. It strives to change the ways of working (constituted by discourse, organization and power relations).

For (Colmenares, 2012), each of these paradigms assumes an ontological, epistemological, methodological and ethical vision that guides the researcher on how she directed her object of study, reality; how she related this to her knowledge, the ways of knowing that reality, even how it is going to present the findings that emerge from this research As can be seen, the scope of action research is broad and goes beyond the strictly educational frontiers; to be extended to any sector; even to the business world, going through any project of social policy, community development or cultural type.

In the same way, each paradigm deserves a concordant methodology that allows the development of investigative processes; In the case of the social-critic, the method is represented by the research - action that guides the procedures, techniques and instruments in accordance with the onto-epistemic vision assumed by the researcher according to researchers.

Critical emancipatory action research is a methodology that presents certain characteristics that distinguish it from other options under the qualitative approach. That is why action research involves establishing new relationships with other people, therefore, it is convenient to develop some skills regarding knowing how to listen to others, knowing how to manage information, knowing how to relate to other people, knowing how to involve them in the research and include them in a consensual way in the study, following a method that the researcher has designed (Magni, 2017).

3.2.1: Reflexity

In Reflexity, the researcher was able to know to what extent the transformation of reality transcended, and was able to guarantees it will continue over time. The researcher gathered and developed a lot of data without being biased. During data gathering critical evaluation was done by the research, the research topic was an area the researcher was not familiar with and so had to do a lot of reading around the subject area of palm oil extraction in developing countries before narrowing the scope to Ologbo in Ikpoba-Okha of Edo state Nigeria. The researcher initially intended to travel to Ologbo in Edo State Nigeria to collect primary research data but due to the corona virus pandemic and travel restriction at the time, the researcher had to settle for Virtual interview through zoom which posed a lot of challenges, firstly the researcher had never done virtual interview before and so had to do some mock interviews virtually with family and colleagues and also due to poor telephone network from Nigeria this posed another challenge but this hurdle was scaled as the researcher wanted the experience and authenticity of interviewing the research participants herself to try to understand and observe their responses to questions answered. The data gathering process (interviews lasted for over 4weeks due to time spent by researcher on each research participants 45-1hour per participants.

The quality of the knowledge generated from this research was of high quality, the researcher in this research used the (Lee and Choi 2003) Enabler framework to develop her research framework the Lee and Choi framework is not a very popular framework and so posed a lot of challenge, which was a good learning for the researcher.

Ethics was followed and taken into consideration, the researcher adhered to the university and the UK ethical standard for conducting research by making sure that researcher participants consent approval was given and participants were aware they could pull out anytime they wished from the research.

The researcher also knew what the limitations for development would be. It should be noted that any process of change generates uncertainty in the research, therefore, different forms of clarification was sought for one or another process that generated this change in the research. For this research, the epistemological perspective was assumed, as it allowed to link the position of

various authors used in this research to the intention of the research. For this, the theory of (Kemmis et al., 2000.) among others, were reviewed, through reasoning and argumentation, theoretical propositions were formulated, determining the results. The design plan used by the researcher used a coherent work plan to obtain and study the data that brought knowledge closer to the reality of the research study.

3.2.2: Ethical Consideration

The researcher followed UWTSD research data management policy and the General data Protection Regulation Act 2018 (GDPR) UK regulations which also complies with Nigeria government Agency (National information Technology Department) revised on the 25th of January 2019. (**ndpr.nita.gov.ng/)**

The research was also approved by the Ologbo Ikpoba-Okha government area office for the researcher to carry out research in the locality on palm oil extraction (**See appendix 5**) for letter of Authorization. The researcher also conducted a full risk assessment prior to undertaking research on UWTSD PG2 form (**See Appendix 1**) Approval of Ethical form.

Research procedure and consent was obtained from all participants before the interviews and after the interviews, (**See appendix 2**) No humans or animal was harm during and after the research.

UK government and Nigeria government confidentiality act research participants details was kept and locked up by researcher safely in a safe locker with keys which is only accessible to researcher.

Research participants where made aware they could pull out of interview at any time they so desire, research participants were not under any duress and each research participant was interviewed individually and privately.

3.2.3: Research Limitation

The researcher faced limitation using qualitative research method, according to (Sabino, 2002), All qualitative research begins with the idea of generating a change to improve a specific

situation and believes that qualitative designs are by no means simpler or easier to develop than other types of design, on the contrary, they require a very careful work of data collection, analysis and interpretation that can only be done after proper preparation. Using qualitative method by the researcher for this research was not easy, the researcher had to interview people and collect their opinions by interpreting what they are saying and this is not easy the researcher had to evaluate the answers carefully, to incorporate a lot of previous knowledge to the necessary and complex task of interpretation.

This interpretation is aimed at causing changes in the reality studied, incorporating the subjects involved in the research, to actively participate in the intervention proposal, always taking into account that there are psychological barriers, on the part of the researcher as well as those investigated, since they take more into account the present than the future, presenting interferences that arise from the particularities of people, such as their habits, customs, past experiences, even their perceptions preventing listening and understanding.

The research believe that this research has been a benchmark in the field of qualitative research, in that it allows us to know the problems from experiences, action research used by the researcher includes processes aimed at the realization of those intrinsic values to certain reality. Although the research is focused on a single place (Ologbo Ikpoba-Okha), there are external factors that must be considered in the research process, which may or may not be favorable when developing the experiences. The purpose of this research is to know the tool for transformation, since in recent years in Nigeria regarding palm oil extraction it has grown dramatically which is why this research serves as a reference to educational and social practices.

The researcher had to look for the 20 people from indigenous farmers and 20 people from contemporary palm oil farmers to interview a lot of canvassing was done with the help of a Member of the Ikpoba-Okha local government representative to speak to different farmers from both groups (indigenous and contemporary farmers) who agreed to be interviewed.

There were lots of rejections by farmers who were not comfortable being interviewed

The local representative made his mobile phone available for the zoom calls to speak to the Participants from the indigenous and contemporary farmers as none of them wanted to use their

phone data credits to make the zoom calls to partake in the online interview.

During the zoom calls sometimes, the lines would cut due to poor network connection, which caused the interview formalities to re-start all over again when it happens.

The local representative had to plead with the participants to be interviewed and for most of the indigenous farmers, the local representative from the Ologbo Ikpoba-Okha local government council made his mobile phone available to make the zoom calls possible for the 4weeks used and being the researcher first time of carrying out an online interview the first 3 interviews where quite difficult but as the interviews progressed, the researcher was able to flow with the questions and the researcher participants felt more relaxed.

Secondary research was also used by the researcher, due to the covid restriction in the UK and the world, assessing some secondary research data online was quite difficult and created a lot of delay to starting the research.

Also, the research topic indigenous Knowledge Management practices, looking at the historical perspectives of palm oil extraction in Ologbo Ikpoba-Okha of Edo State Nigeria were not an easy topic, as there were not too many articles on the research subject areas on indigenous palm oil practices in developing countries, research had to carry out more extensive search on the study area to find research and work that was relevant to the research area.

3.2.4: Summary

In this methodology section the researcher used case study method to formulate research questions based on research objectives. The research design that was used for this research is qualitative research method and the research philosophies used are phenomenology and interpretivism, the researcher also used inductive approach in this research and choose semi-structured method in the interview process using zoom to conduct the interviews due to covid-19 restrictions in place during the data collecting phase of the research, both primary and secondary research data was collected and used for this research.

The sampling method used by the researcher for this research is purposive sampling, research participant description was also collected and presented in this methodology section. Research transcript and data analysis procedure was described in this section and the researcher for this research used research Categorisation, abstraction and also explained the research reliability and validity in this section. The researcher also researched saturation in this research and Reflexity was also done by the researcher.

Chapter 4: Data Analysis / Findings

4.0: Introduction

This section shows the result of the collected data which is extracted through primary technique in context of the research theme.

For the systematization and analysis of the information obtained, the (Lee and Chow, 2003) framework was used to construct the questions to be asked, the procedure of systematic analysis of the qualitative data interpretation using the (Spiggle, 1994), data analysis was also used, extracts in the form of quotes are analysed from the transcripts to enable the researcher understand participants views, also coding, abstraction, generalization, synthesis and comparison and integration of codes and delimitation of the theory, exposition of data through concept maps or networks of meaning, writing and verification of the conclusions was also used.

4.1: Research Aims

- To explore, from a historical perspective the palm oil extraction practices in Ologbo Ikpoba-Okha of Edo state of Nigeria and identify models and unique eco-friendly practices.
- To identify if any, areas for improvement of the indigenous practices and lessons that can be learnt from the KM practices of the indigenous people of Ologbo in Ikpoba-Okha in Edo State of Nigeria.
- To explore the current practices of palm oil extraction by small and medium producers in the Ologbo Ikpoba-Okha of Edo state of Nigeria, with a view to identifying how these practices impinge on the local forests and wildlife habitats.
- To utilize the indigenous knowledge of palm oil extraction of the people of Ologbo in Ikpoba-Okha that protected environment and wildlife and promoted the eco system with a regeneration and sustainability perspective.

4.2: Research Objectives

To achieve the above aims this thesis will follow the research objectives

RO1- To understand and highlight the historical KM practices of palm Oil extraction of the people of Ologbo in Ikpoba-Okha of Edo State of Nigeria – the specific ways information was gathered, stored and disseminated.

RO2- To understand and highlight the current practices of palm Oil extraction and KM of the small and medium producers of Ologbo in Ikpoba-Okha of Edo State of Nigeria

RO3- To use the historical practices of (KM) of the people of Ologbo in Ikpoba-Okha to generate new ideas and find new sustainable ways of natural resources management of palm oil extraction.

RO4- To improve and enhance the processes of palm oil extraction practices of the indigenous people of Ologbo in Ikpoba-Okha of Edo state of Nigeria in an eco- friendly manner.

RO5- To develop a framework for understanding indigenous and current knowledge management practices of palm oil extraction.

4.3 Findings from the interview

This section will provide findings from the interview transcript generated from the semi-structured interviews. **(See appendix 3 and 4)**

RQ1- How was information stored in the past by your business with regards to palm oil extraction?

RQ2- What are your concerns with the way palm oil extracting was done in the past?

RQ3- What are the local and traditional practices incorporated in your palm oil extracting process?

RQ4- What do you think was good about the past (traditional) extracting palm oil process?

RQ5- What don't you like about the ways you do palm oil extraction in the present?

4.4: Procedure for Presentation of Findings

The procedures were taking into consideration the views of local indigenous palm oil farmers and views of contemporary palm oil farmers in Ologbo in Ikpoba-Okha local government area of Edo state and these views are divided in sub-sections in each theme where answers are divided based on the emphasis of all participants interviewed.

4.5: Theme 1: Findings

Historical Overview of palm oil production in Nigeria using KM

This section based on the research objective on theme 1, presents findings on the historical overview of palm oil production in Nigeria using Knowledge Management process. (**See table B)** for themes and sub-themes in this section.

How information was stored in the past by both contemporary palm oil extracting businesses and indigenous palm oil businesses**.**

The analysis presented to understand the knowledge management process of palm oil extraction in the past for both contemporary and local indigenous farmers. (**See appendix 3 and 4 for interview transcripts)**

Findings to question 1:

How Information was stored in the past on palm oil extraction process

In this section findings on how information regarding palm oil extraction was stored in the past showed that in the past information was shared through words of mouth and this section was divided into sub-themes which were identified in the analysis, improve information storing system and training farmers on IT systems on storing of information.

Training to be given to (contemporary and indigenous) farmers

It was found that training on the use of IT system on Knowledge Management of storing and sharing of best practices when it comes to extraction of palm oil was not given to farmers (contemporary or indigenous farmers) by the government and most of the indigenous farmers do not have IT systems all their information was by words of mouth.

"This will help our knowledge management of extracting our palm oil effectively (contemporary farmer 15)

This will increase our farm yields and boost our profits. (Local indigenous farmer 10)

Improve information technology system

Findings from both contemporary and indigenous palm oil farmers showed that they did not have proper IT systems for storage of their farm yield and information in the past and there is need for their current IT systems where available these days to be managed effectively as this information will improve their knowledge management of palm oil extraction.

There was no proper information storage system in the past. We need to improve IT systems for storage of information on our farm yields (contemporary farmer contemporary farmer 11)

We shared information in the past through words of mouth, if we had IT system it would have helped our knowledge management of our palm oil extracting process more (local indigenous farmer 2)

This will help our knowledge management of extracting our palm oil effectively (contemporary farmer 15)

This will increase our farm yields and boost our profits. (Local indigenous farmer 10)

Findings to question 2:

What are your concerns about the way palm oil extraction was done in the past in your opinion?

Participants were asked on their concerns of how palm oil extraction was done in the past and these are their views in sub-themes.

Occupational Hazards

Both contemporary and indigenous palm oil farmers claim that the extraction process done in the past posed a lot of risk to farmers due to, farming terrain, insecticides, workload, lack of proper tools for the local farmers or machinery for the contemporary farmers to use during extraction and this resulted into a lot of accidents during extraction process.

During extraction in the past there used to be oil spillage that resulted in burns (Contemporary farmer 5)

We did not have proper tools to use that caused a lot of injury (local indigenous farmer 1)

Lack of Government support

Both contemporary and indigenous farmers claim there was no government support for loans or educational support from Nigeria Ministry of Agriculture in those days for them.

I had to sell of personal belongings to raise money to support my farm business (contemporary farmer 1)

Most financial support to expand our farms was given by friends and family (local indigenous farmer 8)

Lack of Regulation

According to this finding by both Contemporary and indigenous farmers interviewed said although extraction of palm oil is still not properly regulated to date in Ologbo Ikpoba-Okha, it was worse in those days.

The local government did not give any guidance on palm tree certification then (contemporary farmer 9)

Profit in those days came before lives, as a lot of farmers then cared more about to increase their profits than the environment (Local indigenous farmer 20)

Findings to question 3:

What are the local and traditional practices incorporated in your palm oil extracting process in the past?

This sub-section presents its findings on the local and traditional practices incorporated into palm oil extracting processes by contemporary and indigenous farmers and the analysis found that both groups incorporated some traditional/local practices such as washing palm seeds before start of extraction process and marking of palm trees to be harvested.

Palm seeds washing/disinfectant

In this finding both contemporary and indigenous farmers claim to rinse or disinfect the seed by water prior to extraction, for the indigenous farmers boiling it in drums or pots while for the contemporary farmer putting them in the extraction machines.

We have a machine ramp where our palm bunch seeds are disinfected using water to prevent insects and other parasites from getting into the extracted oil. (Contemporary farmer 5)

Palm seeds are washed in water in drums prior to extraction. (Local indigenous farmer 10)

Certification of Palm oil

Due to no certification of palm oil by farmers in the Ologbo Ikpoba-Okha region, both contemporary and indigenous farmers claim is leading to bad practices when it comes to production of palm oil by farmers.

Farmers need to certify their palm oil produces to avoid illegal practices of extraction (contemporary farmer 15)

Due to too much impurities these days on palm oil it is good we have a way to certify our farm extracted oil (local indigenous farmer 18)

This finding corresponds to the observations made about the difficulty of certifying palm oil, whether in the context of plantations or in processing, are valid (Higgins, and Richards, 2019).

This finding can by the contemporary and indigenous farmers can be supported according to (Giacomin, 2018), certification of palm oil will be necessary to innovate and promote biodiversity in oil farm plantations.

Findings to question 4:

What do you think was good about the past(traditional) extracting process?

The participants from both the contemporary and indigenous palm oil farmers expressed their views in this section on what they felt was good about the past way of palm oil extracting which were protecting the local wildlife, less impurities in the extracted oil.

Protecting Wildlife

The findings in this section showed that both contemporary and indigenous farmers agree their need to be more regulations to protect the wildlife in the area.

No proper regulation on tree cutting as some companies just don't care (Contemporary 12)

Due to indiscriminate cutting of trees wildlife are fleeing from the area and losing their habitat (local indigenous farmer 6)

This finding is supported by (Jellason et al., 2021), that in the current times farmers do not do much to protect wildlife and the environment despite there being no regulation, model or protocols created by the Nigeria government or local farmers then on how to do palm oil extraction and safeguard the wildlife in the area and these days indiscriminate practice is not good for the local environment.

Better Oil quality

Participants of the contemporary and indigenous palm oil farmer claim that there is not much impurities in traditional palm oil process compared to machined extracting processing these days. Bayat et al., (2018) that these days compared to the past Nigeria palm oil is not accepted in some

part of the world due to impurities in the oil, a lot of indigenous palm oil farmers who use the traditional palm oil extraction methods tend to have cleaner and better palm oil after processing it the traditional way, but they cannot extract their oil in bulk supply due to lack of man-power and mechanized machinery (Bayat et al., 2018).

I don't know much about the traditional palm oil extracting process but I heard it gives less impurities (contemporary farmer 19)

The traditional method is better and our customers prefer it (local indigenous farmer 14)

This finding is supported by (Buochuama and Akhabue, 2018) during palm oil extraction oil compounds are destroyed by heat treatment, which also traps hydrolysis and auto-oxidation. Traditional palm oil extraction brings about cleaner palm oil which is well processed, (Arabomen et al., 2019). Too much high temperature in palm oil extraction process can destroy the oily cells in the mesocarp to a certain extent, (Idu et al., 2020).

Findings from question 5:

What don't you like about the past (traditional) extracting palm oil process?

The findings from this section showed that contemporary farmers found the traditional extracting process too tedious and less profitable due to the traditional tools used and the indigenous farmers claim that although the work process is rigorous but they produce a better-quality palm oil.

Traditional tools/Machined machinery

Most of the participants from the contemporary palm oil farmers feel that the traditional process of palm oil extracting in the past took too long doing it manually and less profitable as less quantity of oil is extracted by the farmers daily.

The traditional method of extraction of palm oil is back breaking when using traditional tools (literally speaking) have you seen the way it is done manually, the process is too tasking (contemporary farmer 13)

It is a hard work, but with improvement in some of our local tools the work is not as hard as it used to be years back and information's was passed around by words of mouth (local indigenous farmer 4)

Less Profitable

Most of the participants from the contemporary farmers do not like the traditional extract methods as it will not increase their company financial performance due to size of production undertake daily with the traditional method.

Due to inadequate process machines used in the traditional extracting process my company will not be able to extract palm oil seeds at a large scale daily and this will not be profitable (contemporary farmer 14)

We started our process business to support our family daily upkeep and the extra we should to the local market so our initial farming has not driven by profit until recent years (local indigenous farmer 9)

This finding is supported by the fact that unsustainable development of the Nigeria palm oil extracting business done in the traditional way has created a number of problems since the middle 1960's, including a decline in palm oil exports a lack of independence in the domestic supply of palm oil, and the importation of palm oil to meet public demand (Yadav et al., 2020).

Palm oil extraction done by small, SMEs or medium palm oil farmers if done in large scale tends to improve the financial input of the businesses there by improving organisation performance,

(Majekodunmi, 2018). A well planned and carried out palm oil extraction process is one of the most important steps in improving organisation performance for palm oil companies, (Suurshater and Tope, 2019).

4.6: Table 2: For Theme 1

Historical Overview of oil Palm Production in Nigeria using indigenous Knowledge Management Process.

Main theme	Sub-theme	Contemporary Farmers	Local Indigenous Farmers
How Information was stored in the past by both contemporary and indigenous farmers	To improve information storing system	There was no proper information storage system in the past. We need to improve IT systems for storage of information on our farm yields (contemporary farmer contemporary farmer 11)	We shared information in the past through words of mouth, if we had IT system it would have helped our knowledge management of our palm oil extracting process more (local indigenous farmer 2)
	Training to be given to farmers	This will help our knowledge management of extracting our palm oil effectively (contemporary farmer 15)	This will increase our farm yields and boost our profits. (Local indigenous farmer 10)

Concerns about the way palm oil extraction was done in the past	Occupational Hazard	During extraction in the past there used to be oil spillage that resulted in burns (Contemporary farmer 5)	We did not have proper tools to use that caused a lot of injury (local indigenous farmer 1)
	Lack of government support	I had to sell of personal belongings to raise money to support my farm business (contemporary farmer 1)	Most financial support to expand our farms was given by friends and family (local indigenous farmer 8)
	Lack of regulation	The local government did not give any guidance on palm tree certification then (contemporary farmer 9)	Profit in those days came before lives, as a lot of farmers then cared more about to increase their profits than the environment (Local indigenous farmer 20)
Local and Traditional practices incorporated in palm oil extraction process	Palm seed washing/disinfectant	The have a machine ramp where our palm bunch seeds are disinfected using water to prevent insects and other parasites from getting into the extracted oil. (Contemporary farmer 5)	Palm seeds are washed in water in drums prior to extraction. (Local indigenous farmer 10)

	Certification of Palm trees	Farmers need to certify their palm oil producers to avoid illegal practices of extraction (contemporary farmer 15)	Due to too much impurities these days on palm oil it is good we have a way to certify our farm extracted oil (local indigenous farmer 18)
What was good about traditional/past palm oil extracting process	Protecting wildlife	No proper regulation on tree cutting as some companies just don't care (Contemporary 12)	Due to indiscriminate cutting of trees wildlife are fleeing from the area and losing their habitat (local indigenous farmer 6)
	Better oil quality	I don't know much about the traditional palm oil extracting process but I heard it gives less impurities (contemporary farmer 19)	The traditional method is better and our customers prefer it (local indigenous farmer 14)
What was not liked about the past (traditional)extra	Traditional/machinery tools.	The traditional method of extraction of palm oil is back breaking when using traditional tools (literally speaking) have you seen the	It is a hard work, but with improvement in some of our local tools the work is not as hard as it used to be years back (local indigenous farmer 4)

cting palm oil process		way it is done manually, the process is too tasking (contemporary farmer 13)	
	less profitable	Due to inadequate process machines used in the traditional extracting process my company will not be able to extract palm oil seeds at a large scale daily and this will not be profitable (contemporary farmer 14)	We started our process business to support our family daily upkeep and the extra we should to the local market so our initial farming has not driven by profit until recent years (local indigenous farmer 9)

Data Taken from virtual interview from contemporary and indigenous farmers

4.7: Theme 2: Findings

To understand and highlight the current practices of palm Oil extraction and KM of the small and medium producers of Ologbo in Ikpoba-Okha of Edo State of Nigeria

This section is based on the research theme 2 and it will present its findings to understand and highlight the current practices of palm oil extraction and knowledge management of small and medium(contemporary) producers of Ologbo in Ikpoba-Okha.

The main themes covered in this section on what where the current palm oil extraction practices used by their business, what training were put in place for them by their business, what are the current process they use in carry out palm oil extraction in their business, what knowledge management software or data are they currently using in their business to inform them of best practices and also are any of their current palm oil extraction practices taught. **(See table 2**) for details of themes and sub-themes in this section

Interview questions for Theme 2

RQ1: What are your views about the current palm oil extraction practices used by your business?

RQ2: What current training are in place to support you in your palm oil extraction business?

RQ3: What other support systems are in place for you or your employees to develop in your palm oil extraction business?

RQ4: What management software or data do you have that helps to inform your business of best practices when it comes to palm oil extraction?

RQ5: How has the knowledge management (KM) your farm use influenced or affected the way your company manage its business?

RQ6: How do you share your knowledge on palm oil extraction with similar palm oil farmers in your local community?

Findings to question 1:

What are the Current Palm Oil Extraction processing your business Use?

Participants from contemporary and indigenous local palm oil farmers were asked to express their views about what current palm oil extraction practices they use in their business. **(See appendix 3 and 4 for interview transcript)**

Systematic Operational Process

Findings from participants from the contemporary and indigenous palm oil farmers said that they follow systematic operation process.

> *"We follow several mechanical and chemical pressing process we follow after we have done our seed heating which is done using indirect steaming" (contemporary farmer 16)*

> *"I still do extraction using the traditional way, boiling the seeds in a drum or pot and then we use pestle to pound the seeds for extraction or use locally made digester" (local indigenous farmer 14)*

Findings from question 2:

What Current Training are in place for extraction process in your business?

Participants of both contemporary and indigenous palm oil farmers were asked what trainings where in place to support them.

In House Training

The participants of the contemporary palm oil farmers claim to have in-house job training to either operate the extraction machines or training on the extraction process and these trainings can sometimes last between 6 to 12months depends on the area of work in the business and for some other employees who have had previous training prior to joining them in-house training of up to 3months is done and this is different from the indigenous farmers who claim to learn most of their skills from observing others work in the field.

"Training are given to our staff which can last 6months to one year sometimes and sometimes if they have previous training elsewhere then supervised practices is given "(contemporary farmer 16)

"I learnt from observing others work such as my uncle" (local indigenous farmer 11)

Supervised Practice

Some participants from contemporary palm oil farming claim to have supervised training in the job as they were allocated a senior experienced worker to shadow them work for sometimes 3-6months to teach them the intricacies involved in the work but this was not the case with participants from the indigenous farming who learnt their skills from observing their relatives or family member's work.

There is provision for supervised practice for employees with past experience in the industry (contemporary indigenous farmer 4)

I never had a supervised practice I learnt from observing others work (local indigenous farmer 20)

The findings from the answers given by the contemporary and indigenous farmers can be supported by

Findings from question 3:

Apart from training what other Support Systems are in Place for Your Staff/employees?

Most of the contemporary participants claim to have support systems in place for their staff compared to the indigenous farmers who claim occasional during festive periods do take time off work to celebrate.

Incentive linked to Performance

The question asked to the participants to find out what other support was giving to staff showed in this finding that workers were compensated financially based on their job performance by the contemporary farmers why most of the indigenous farmers who were mostly sole owners treated themselves to holiday breaks as incentives for good farm yields.

"KPI are set and if met by staff then annual bonus are given "(contemporary farmer 8)

"Is my business, so I pay myself any extra profit I make and reward myself with a holiday during festive periods" (local indigenous farmer 6)

Staff Recognition

Participants from contemporary palm oil farmers claim to have monthly staff meetings and Christmas end of year parties where hard-working staff in different department of the palm oil company are recognised either as worker of the month and prizes are given to staff at the end of year parties organised by the company.

"With the hard work involved in our business, awards are giving to best working staff in our company to encourage them" (contemporary palm oil farmer 9)

"Sorry we don't have system like this in place" (local indigenous farmer 2)

Findings from question 4:

What Knowledge Management Software or data do you have that helps to inform your business of best practices when it comes to your business?

Agrisoft System

Participants of both the contemporary and indigenous palm oil farmers where asked what KM software or data they are currently using in their business of palm oil extracting and these are the findings.

"We use Agrisoft Systems is a palm oil management program is the most comprehensive and sophisticated software solution available to the palm oil farmers in our area" (contemporary farmer 12)

"I get Information from local government agricultural department in Ologbo, information gathered from other local palm oil farmers in the area by words of mouth" (local indigenous farmer 9)

Findings from question 5:

How has the knowledge Management (KM) your farm used influenced or affected the way your company manage its business?

Most participants of the contemporary and indigenous farmers interviewed said that knowledge management has influenced the way their company do business in terms of profit, knowledge sharing among staff, Maximising their resources.

Increase Profit

Participants of both contemporary and indigenous farmer had this to say in their findings.

"We have seen increase in our profits as a result" (contemporary farmer 12)

"Information passed to me, have helped me to know which fertilizer is good for my farm" (indigenous farmer 7)

Better Farm Yields

Participants of contemporary palm oil business and indigenous palm oil farmers said that due to development in KM their palm oil brunches have increased its yield because they know which fertilizer is right for them and better irrigation system in place due to KM software.

"We have seen more fruitful harvest and bigger palm crops in our business due to KM software usage "(contemporary farmer 3)

"It has brought good development for my business" (local indigenous farmer 18)

Prevent Against Resources wastage

Participants of the contemporary business in tis findings claim that due to KM their business can measure and allocate the right amount of seedlings to plant, know what quantity of fertilizers to buy in their fields

"My company do not waste money on products we don't need anymore as we now have available information on quantities of different farming products, we need for our palm oil extraction "(contemporary farmer 17)

"From information shared and passed on from government to us I know the quantity of seeds that is enough for my farm "(local indigenous farmer 1)

Findings from question 6:

How do you share your knowledge or practices with similar palm oil farmers in your local community?

When examining the data, it was noticed by the researcher that participants from the small and medium (contemporary) farmers and indigenous farmers have similar ways of sharing information to the local community they do business in.

Local Trading Association/Meetings

Participants from the contemporary farmers said they do share information among themselves in their meetings or forums which are held prior to the covid pandemic monthly but these days sometimes quarterly.

"During our farmers forums or meetings, we discuss on best practices, challenges and opportunities we encounter in our line of work with colleagues from other farms" (contemporary farmer 5)

We have our local union and, in these meetings, we share information on ways on moving forward in our business "(local indigenous farmer 8)

State Ministry of Agriculture

This finding is supported by both the contemporary and indigenous farmers in Ologbo Ikpoba-Okha, that the State Ministry of Agriculture in the form of educational leaflets, symposium and State Expo do share information with them on best palm oil extraction practices.

"We have not had an expo of recent but when we use to the ministry of Agriculture in the state do share information with us on current palm oil farming practices around the world" (contemporary farmer 16)

"I do get information from the state Ministry of Agriculture to support my business" (local indigenous farmer 14)

Company Website/Word of Mouth

Most of the contemporary farmers claim to have company websites where they share latest information on company performance and information such as employment vacancies, product selling prices and company annual performance records.

"We do have company websites, that people can go to find information on our company" (contemporary farmer 12)

I don't have a company website as I cannot afford the maintenance cost but I do share information with my friend from the neighboring farm by words of mouth" (local Indigenous farmer 2)

4.8: Table 3: For Theme 2

Current Palm Oil Extracting Practices and Knowledge Management of Small and Medium (contemporary) Producers of Palm Oil

Main Theme	Sub-theme	Contemporary farmer	Local Indigenous Farmer
Current Palm Oil Extracting Process	Systematic operational process	We follow several mechanical and chemical pressing process we follow after we have done our seed heating which is done using indirect steaming (contemporary farmer 16)	I still do extraction using the traditional way, boiling the seeds in a drum or pot and then we use pestle to pound the seeds for extraction or use locally made digester (local indigenous farmer 14)

What Current training are in place for extraction process in your business	In-house Training	Training is given to our staff which can last 6months to one year sometimes and sometimes if they have previous training elsewhere then supervised practices is given (contemporary farmer 16)	I learnt from observing others work such as my uncle (local indigenous farmer 11)
	Supervised Practice	There is provision for supervised practice for employees with past experience in the industry (contemporary indigenous farmer 4)	I learnt from observing others work such as my uncle (local indigenous farmer 11)
Apart from training, what other support systems are in place for your staff/employees?	Incentive linked to performance	KPI are set and if met by staff then annual bonus are given (contemporary farmer 8)	Is my business, so I pay myself any extra profit I make and reward myself with a holiday during festive periods (local indigenous farmer 6)
	Staff Recognition	With the hard work involved in our business, awards are giving to best working staff in our	Sorry we don't have system like this in place" (local indigenous farmer 2)

		company to encourage them" (contemporary palm oil farmer 9)	
What Knowledge Management software or data do you have that helps to inform your business of best practices when it comes to your business?	Agrisoft System	We use Agrisoft Systems is a palm oil management program is the most comprehensive and sophisticated software solution available to the palm oil farmers in our area (contemporary farmer 12)	I get Information from local government agricultural department in Ologbo, information gathered from other local palm oil farmers in the area by words of mouth (local indigenous farmer 9)
How has the knowledge Management your farm uses influenced or affected the way your company manage its business?	Increase Profit Better Farming Yields Prevent Against Resources Wastage	We have seen increase in our profits as a result" (contemporary farmer 12) We have seen more fruitful harvest and bigger palm crops in our business due to KM software usage "(contemporary farmer 3) We have seen more fruitful harvest and bigger palm crops	Information passed to me, have helped me to know which fertilizer is good for my farm (indigenous farmer 7) It has brought good development for my business (local indigenous farmer 18) From information shared and passed on from

		in our business due to KM software usage (contemporary farmer 3)	government to us I know the quantity of seeds that is enough for my farm (local indigenous farmer 1)
How do you share your knowledge or practices with similar palm oil farmers in your local community?	Local trading association/Meeting State Ministry of Agriculture	During our farmers forums or meetings, we discuss on best practices, challenges and opportunities we encounter in our line of work with colleagues from other farms (contemporary farmer 5) We have not had an expo of recent but when we use to the ministry of Agriculture in the state do share information with us on current palm oil farming practices around the world (contemporary farmer 16)	We have our local union and, in these meetings, we share information on ways on moving forward in our business "(local indigenous farmer 8) I do get information from the state Ministry of Agriculture to support my business (local indigenous farmer 14)

	Company Website/word of mouth	We do have company websites, that people can go to find information on our company (contemporary farmer 12)	I don't have a company website as I cannot afford the maintenance cost but I do share information with my friend from the neighboring farm by words of mouth (local Indigenous farmer 2)

Virtual Data: taken from contemporary and indigenous farmers.

4.9: Theme 3: Findings

Generating New Ideas and Sustainable Ways of Natural Resources Management of Palm Oil Extraction.

In this section of the findings chapter, participants views were sought on how they can generate sustainable ways of natural resources management of palm oil extraction. **(See table 3**) for themes and sub-themes and (**See appendix 3 and 4 for interview transcript**)

Interview questions

RQ1: How does your business generate new ideas and sustainable ways for palm oil extraction?

RQ2: Are there any other ways your palm oil extraction business is made sustainable?

RQ3: How do you think traditional knowledge management of palm oil extraction can improve sustainability in Ologbo Ikpoba-Okha?

RQ4: What can the indigenous farmers do to enhance the traditional palm oil extraction for sustainability?

RQ5: what do you think can be done to bridge the gap between indigenous and current KM practices to promote sustainability?

Findings from question 1:

How does your business generate new Ideas and sustainable ways of natural resources management of palm oil extraction?

Participants from both contemporary and indigenous palm oil farmers were asked how they were generating new ideas and sustainable ways of management of palm oil extraction in their local community.

Forming organisation of cooperation

Participants from both contemporary and indigenous farmers in Ologbo Ikpoba-Okha, agreed that forming an organisation that will look into sustainable ways of doing palm oil extraction in the community will promote sustainability of palm oil extraction.

> *"We have an organisation in our local region called Agenda 21 which has drawn out and is looking at new ways of regulating palm oil extraction "(contemporary farmer 1)*

"I have received visits from the state ministry of agriculture telling us how to promote sustainable farming in my business" (local indigenous farmer 12)

Promoting the Industry

The contemporary and indigenous farmers agreed that the Ministry of Agriculture in the state needs to do more to promote the palm oil extracting business.

"There needs to be proper promotion of palm oil business in the region, the state ministry of agriculture needs to do more in this regard "(contemporary farmer 14)

"We need more support from the government to help our business to grow more" (local indigenous farmer 7)

Access to global Market

Findings in this section showed that participants supported the idea of access to global market of their extracted palm oil products.

"Our business needs to be able to compete in the global market to sell our produce" (contemporary farmer 17)

"I produce my palm oil for the local community, I hope in future I can trade globally" (indigenous farmer 3)

Ecological Economic Zoning

Participants from the contemporary farmers said they have the Ecological-Economic Zoning (ZEE) considered as the most important instrument of environmental management for aiming at the ordering of land use relating socioeconomic conditions and ecological conditions, has been implemented in the Ologbo Ikpoba-Okha

> *"The ZEE in our local region has been sending messages via leaflets and through local forums to support our business on good sustainable ways of doing palm oil extraction" (contemporary farmer 14)*

> *"I have received leaflets on best farming practices for my farm business" (local indigenous farmer 5)*

Palm Tree Certification

Participants from both the contemporary and indigenous farmers in Ologbo Ikpoba-Okha of Edo state said there are aware of palm tree certification but the cost of having it done in the region is the issue.

> *"Palm tree certification will lead to sustainable way of palm oil extraction in the country but it will be a very expensive exercise and we will need the support of the government to do it "(contemporary farmer 18)*

> *"Very good idea, but I cannot afford such" (local indigenous farmer 9)*

Stop illegal burning of Forest

Participants from the contemporary and indigenous palm oil farmers in this finding advocated for the banning of illegal forest burning which some farmers do and a practice that is dangerous to the wildlife in the area.

> *"My business advocate against burning of farmland after harvest as this is a very wrong practice that should be stopped "(contemporary farmer 1)*

> *"The practice of burning down the palm trees after harvest is an historic practice but I personally do not do that in my farm anymore" (indigenous farmer 10)*

Findings from question 2:

Are there any other ways your palm oil extraction business is made sustainable?

Contemporary and indigenous farmers participants gave their views during the interviews on how they think their business can generate more sustainable ways of palm oil extraction in their businesses.

Training /development of skills

In this findings participant from the contemporary and indigenous farmers agree that more needs to be done in terms of training on new and better ways of palm oil extracting.

"Training must be regularly given on current or better ways of palm oil extracting based on research and evidence "(contemporary farmer 12)

"I will welcome any training the ministry of agriculture can give me to develop my farm more" (local indigenous farmer 8)

Development of information technology

In this finding the participants agreed that their needs to be development of information technology with regards to palm oil farming in their businesses.

"The technology we use in our extraction process in my company is good but it can be better with current technology in the market for our extraction process" (contemporary farmer 20)

"We use locally made extraction machines for our business, but if we have better machines our business profit will increase" (local indigenous farmer 15)

Financial Incentive

Participants from the contemporary and indigenous palm oil farmers in this finding all agree that having access to financial support such as bank or government loans will go a long way to support them in their palm oil extracting business.

"Getting loans from the banks is very difficult and too many stringent rules, this process should be made less difficult for farmers" (contemporary farmer 11)

"We need support and information on how to get loans to support our business to develop" (local indigenous farmer 3)

Certified sustainable palm oil

Most participants from the indigenous farmers did not agree that certified palm oil practices were the best way forward for them compared to the contemporary farmers due to the cost involved in these practices.

"Even though certification of palm oil by different business will cost money, it will definitely make room for improvement as customers want the guarantee that what they are buying is good quality "(contemporary farmer 13)

"It will lead to discrimination of cut us off the market and competition" (local indigenous farmer 6)

Empowerment of the Local community

Participants from the contemporary and indigenous farmers interviewed suggested that if information is shared with members of the local community on how best to protect the environment and are aware of the damages that can occur due to illegal cutting down of palm trees in the local forest those of them intending to start palm oil extracting business in the future will be better prepared to avoid cutting down these palm trees

"Every day new palm oil extracting business is opened in the community; farmers need to be inundated with the pros and cons of starting this kind of business prior to commencing" (contemporary farmer 8)

"Upcoming farmers need to be introduced into sustainable palm oil farming ways "(local indigenous farmer15)

Findings from question 3:

How do you think traditional knowledge management of palm oil extraction can improve sustainability in Ologbo Ikpoba-Okha?

Participant from contemporary and indigenous farmers were asked this question during the interview and this was the findings from the questions.

Less Expensive Method

Most of the indigenous farmers interviewed said that the traditional palm oil extracting process is less expensive and as a result will be sustainable.

"Traditional methods I believe does not cost much to do extraction and I believe that is a good thing "(contemporary farmer 16)

"Our processing method are less expensive and easy to learn "(indigenous farmer 2)

Promote Quality

Participants from the contemporary and indigenous palm oil farmers had different views as to which style of palm oil extraction produced the best quality of palm oil with less impurities and as a result is more sustainable.

> *"The more palm oil extraction our business can process means an increase in our capital and therefore our business can expand and strive for many more years, and so will our product quality improve more" (contemporary farmer 11)*

> *"Even though we are not a big business, our palm oil is of high quality and our local environment patronise us and so my business is growing "(indigenous farmer 7)*

Findings from question 4:

What can the indigenous farmers do to enhance the traditional palm oil extraction for sustainability

In this section participants from the contemporary and indigenous farmers were asked how do they think they can enhance or promote traditional palm oil extraction process for sustainability.

Land preservation/cultivation

Participants from both the contemporary and indigenous farmers interviewed said land preservation and proper cultivation will prevent deforestation in the area.

> *"It will be a good idea to promote good land cultivation for palm oil farming business to promote sustainability" (contemporary farmer 11)*

"We cultivate and process our palm oil the traditional way and this will lead to sustainability of our business "(indigenous farmer 5)

Trading on the global stage

Participants from both the contemporary and indigenous farmers were asked what they can do to enhance or promote traditional extraction process to promote sustainability in their business they said being able to sell their palm oil produce around the world will promote their business and sustain it.

"If they can export their palm oil produce worldwide, I believe it will lead to a sustainable business for them "(contemporary farmer 17)

"The more I can do business all around Nigeria and hopefully internationally in the future I am sure it will lead to sustainability of my business "(indigenous farmer 5)

Findings from question 5:

What do you think can be done to bridge the gap between indigenous and current KM practices to promote sustainability?

Participants from the contemporary and indigenous farmers in their answers to these questions gave this finding as to what they think will bridge the gap between indigenous and current KM practices of palm oil extractions as, trainings and proper record keeping of traditional palm oil processing methods, financial support given to indigenous farmers to develop their practices, improve working conditions for indigenous farmers.

Training and Proper record keeping

Both contemporary and indigenous farmers believe if records are kept on traditional practices on palm oil processes which has allowed indigenous farmers through the years to strive without affecting their environment this knowledge can help to promote sustainability for their businesses.

"There are no proper record keeping in the past by indigenous farmers on traditional processing methods they use and this none record keeping has not advanced their practices "(contemporary farmer 19)

"Most of my palm oil extracting practice I learnt from observing my father and also through words of mouth information, if we have proper documented records in the past our business would have grown much bigger by now "(indigenous farmer 15)

Financial Support

Like every other business, the participants from both contemporary and indigenous farmers said indigenous farmers need access to financial support either from banks in form of loans or from the government to be sustainable.

"There should be investment in technology and evidence-based practices that will help to improve palm oil extracting practices "(contemporary farmer 3)

"I want to develop my business but what is lacking for me is the financial incentive to develop my business so is sustainable" (indigenous farmer 17)

Improve Working Conditions

Majority of the participants from the indigenous farmers said that their working conditions during extraction of palm oil is very difficult, due to exposure to heat from cooking the palm seeds and the traditional extraction process as a whole is very strenuous and this makes it difficult for the to get farm help employees, compared to the contemporary farmers who have developed machinery that does most of the extracting process.

"In our palm oil extracting processes, we have machineries that make the process less tedious compared to traditional methods "(contemporary farmer 8)

"The work of palm oil extraction is very hard and so I cannot afford to pay the amount requested by people I wanted to employ to join me in my farm "(indigenous farmer 16)

4.1.0: Table 4: For Theme 3

Generating New ideas and Sustainable Ways of Natural Resources Management of Palm Oil Extraction.

Main Theme	Sub-theme	Contemporary Farmers	Local Indigenous Farmers
Generating New ideas and sustainable ways of natural resources management of	Forming organisation of cooperation	We have an organisation in our local region called Agenda 21 which has drawn out and is looking at new ways of regulating palm oil	I have received visits from the state ministry of agriculture telling us how to promote sustainable farming in my business (local indigenous farmer 12)

palm oil extraction		extraction (contemporary farmer 1)	
	Promoting the Industry	There needs to be proper promotion of palm oil business in the region, the state ministry of agriculture needs to do more in this regard (contemporary farmer 14*)*	We need more support from the government to help our business to grow more (local indigenous farmer 7)
	Access to global market	Our business needs to be able to compete in the global market to sell our produce (contemporary farmer 17)	I produce my palm oil for the local community, I hope in future I can trade globally (indigenous farmer 3)
	Ecological Economic Zoning	The ZEE in our local region has been sending	I have received leaflets on best farming practices for my farm

		messages via leaflets and through local forums to support our business on good sustainable ways of doing palm oil extraction (contemporary farmer 14)	business" (local indigenous farmer 5)
	Palm Tree Certification	Palm tree certification will lead to sustainable way of palm oil extraction in the country but it will be a very expensive exercise and we will need the support of the government to do it (contemporary farmer 18)	Very good idea, but I cannot afford such (local indigenous farmer 9)

	Stop Illegal burning of the forest	My business advocate against burning of farmland after harvest as this is a very wrong practice that should be stopped (contemporary farmer 1)	The practice of burning down the palm trees after harvest is an historic practice but I personally do not do that in my farm anymore (indigenous farmer 10)
Are there any other ways your palm oil business is made sustainable?	Training and development	Training must be regularly given on current or better ways of palm oil extracting based on research and evidence (contemporary farmer 12)	I will welcome any training the ministry of agriculture can give me to develop my farm more (local indigenous farmer 8)
	Development of Information Technology	The technology we use in our extraction process in my company is good but it can be better with	We use locally made extraction machines for our business, but if we have better machines our

		current technology in the market for our extraction process (contemporary farmer 20)	business profit will increase (local indigenous farmer 15)
	Financial Incentive	Getting loans from the banks is very difficult and too many stringent rules, this process should be made less difficult for farmers" (contemporary farmer 11)	We need support and information on how to get loans to support our business to develop" (local indigenous farmer 3)
	Certified Sustainable Palm Oil	Even though certification of palm oil by different business will cost money, it will definitely make room for	It will lead to discrimination of cut us off the market and competition (local indigenous farmer 6)

		improvement as customers want the guarantee that what they are buying is good quality (contemporary farmer 13)	
	Empowerment of the local community	Every day new palm oil extracting business is opened in the community; farmers need to be inundated with the pros and cons of starting this kind of business prior to commencing (contemporary farmer 8)	Upcoming farmers need to be introduced into sustainable palm oil farming ways (local indigenous farmer 6)
How traditional KM improve sustainability	Less Expensive	Traditional methods I believe does not cost much to do extraction	Our processing method are less expensive and easy to learn (indigenous farmer 2)

		and I believe that is a good thing (contemporary farmer 16)	
	Promote Quality	The more palm oil extraction our business can process means an increase in our capital and therefore our business can expand and strive for many more years, and so will our product quality improve more (contemporary farmer 11)	Even though we are not a big business, our palm oil is of high quality and our local environment patronise us and so my business is growing (indigenous farmer 7)
How indigenous farmers can enhance sustainability	Land Preservation/cultivation	It will be a good idea to promote good land cultivation for palm oil farming business to	We cultivate and process our palm oil the traditional way and this will lead to sustainability of our business

		promote sustainability (contemporary farmer 11)	(indigenous farmer 5)
	Trading on the global stage	If they can export their palm oil produce worldwide, I believe it will lead to a sustainable business for them (contemporary farmer 17)	The more I can do business all around Nigeria and hopefully internationally in the future I am sure it will lead to sustainability of my business (indigenous farmer 5)
How do you bridge the gap between indigenous and current KM practices to promote sustainability	Training and proper record keeping	There are no proper record keeping in the past by indigenous farmers on traditional processing methods they use and this none record keeping has not advanced their practices	Most of my palm oil extracting practice I learnt from observing my father and also through words of mouth information, if we have proper documented records in the past our business would have grown much bigger by now (indigenous farmer 15)

		(contemporary farmer 19)	
	Financial Support	There should be investment in technology and evidence-based practices that will help to improve palm oil extracting practices (contemporary farmer 3)	I want to develop my business but what is lacking for me is the financial incentive to develop my business so is sustainable (indigenous farmer 17)
	Improve Working Condition	In our palm oil extracting processes, we have machineries that make the process less tedious compared to traditional methods (contemporary farmer 8)	The work of palm oil extraction is very hard and so I cannot afford to pay the amount requested by people I wanted to employ to join me in my farm (indigenous farmer 16)

Data taken from virtual interview

4.1.1: Theme 4: Findings

To improve and enhance the process of palm oil extraction practices of the indigenous people of Ologbo in Ikpoba-Okha of Edo State of Nigeria in an eco-friendly manner.

Participants from both contemporary and indigenous palm oil farmers in this section were asked to suggest ways they think can improve palm oil extraction in Ologbo Ikpoba-Okha in an eco-friendly manner and these are some of the questions asked by the researcher. **(See appendix 3 and 4 for interview transcripts).**

Interview questions

RQ1: How do you think the process of palm oil extraction can be done in an eco-friendly **way?**

RQ2: What do you think will be the benefits of eco-friendly palm oil farming and processing?

RQ3: What do you think are the problems with not being eco-friendly in palm oil extracting business?

RQ4: What does your business do to promote eco-friendly extraction process?

Findings to question 1:

How do you think the process of palm oil extraction can be done in an eco-friendly way?

In this section participants were asked what they think the process of palm oil extraction can be done in an eco-friendly way and these are the findings from the contemporary and indigenous farmers participants to the question, to stop cutting down of trees, bush burning, farmers should

try to use more traditional palm oil extracting methods, use less chemicals or insecticides in their farms and have regulations that can be enforced to protect the environment **(See table 4)**

Stop cutting down trees

Participants from both the contemporary and indigenous farmers said the indiscriminate cutting down of palm trees after harvest should be stopped as this will lead to deforestation in the long time which is not good for the eco-system of the local environment.

> *"Cutting down trees is not a good practice, as this practice is done by some palm oil farmers which is not good for the environment" (contemporary farmer 12)*

> *"The cutting down of old palm trees is a practice I met as a farmer, but I don't do that anymore in my farmland, except the tree falls as a result of wind "(local indigenous farmer 5)*

Stop Bush Burning

Both contemporary and indigenous farmers participants interviewed said that bush burning after clearing farmland is a bad practice that has led to big fires that have destroyed a lot of vegetations in the past and is not good for the environment.

> *"There had been wildfires in the past that started from bush burning that got out of control and so I strongly oppose bush burning" (contemporary farmer 1)*

"After clearing our farmland, we use to burn the grass in those days, but the ministry of Agriculture has warned us against such practice because of danger of the fire spreading out of control" (local indigenous farmer 8)

Traditional Methods of extraction

Some of the indigenous farmers mentioned in this finding that the traditional methods of palm oil extraction protect the environment more and is more eco-friendly compared to the machanised method of extraction that involves a lot of machineries but most of the contemporary farmers interviewed did not agree to this notion.

"There is not much evidence that the traditional extraction method protects the environment more than the ones we use, but am sure we can do more on our part to protect the environment "(contemporary farmer 14)

"Our traditional extraction method uses locally made tools and does not involve industrial machineries that blow fumes into the atmosphere" (local indigenous farmer 10)

Regulations on protecting the environment

In this section participants from the contemporary and indigenous farmers all agreed that there should be regulations by the state local government ministry of Agricultures to inform and guide farmers in the areas on what is allowed and not allowed to protect the environment they farm in.

"I suggest stringent regulations or laws to be added to laws already in place for farmers so as to protect the environment and the local wildlife's in them "(contemporary farmer 19)

"There should be ways to stop or prevent farmers from destroying the environment through their bad practices" (local indigenous farmers 3)

Less Insecticides/Pesticides usage

The amount and different types of insecticides and chemicals used by different farmers in their farms to protect their crops or cause an increase in the output of their palm trees can cause damages to the eco-system in the environment they farm in, this is a concern raised by some of the contemporary and indigenous farmers participants interviewed.

"We use fertilizers in our farm and due to bacteria, that can affect our palm trees we also seasonally spray insecticides in our farm, but in some other farms if constant insecticides are used this can affect other trees in the environment" (contemporary farmer 20)

"I know the use of insecticides can affect the environment so I avoid it in my farm land" (local indigenous farmer 14)

Findings from question 2:

What do you think will be the benefit of an eco-friendly palm oil extracting business?

In these sections participants interviewed from the contemporary palm oil farmers and the indigenous palm oil farmers where asked what they think were the benefit of an eco-friendly extracting business and this was the findings.

Profits for farmers

Both the contemporary and indigenous farmers said if the eco-system of the area is protected, that means their business will grow as they will be able to farm for years and make profits.

> *"Making profit is one of the biggest reasons we started this business and an eco-friendly environment will lead to better yields of our farming produce" (contemporary farmer 13)*

> *"If the environment is conducive for palm oil farming and extraction then my business will grow and I will make more money from my work" (local indigenous farmer 1)*

Improvement in living conditions

In this finding participants from the contemporary and indigenous farmers said that an eco-friendly environment will be good for the Ologbo Ikpoba-Okha community as people will breathe cleaner air and that will lead to less sickness and diseases.

> *"If the environment is eco-friendly this will benefit our workers and everyone living in the environment "(contemporary farmer 11)*

"There is a saying in my local dialect interpreted as cleanliness is next to godliness, so an eco-friendly environment will lead to longevity of lifespan" (local indigenous farmer 7)

Create More Job Opportunities

An eco-friendly environment will lead to more companies and people moving to the area to leave or do business and this will create more job opportunities in the local environment according to some of the participants interviewed.

"*Due to an eco-friendly environment their will, be sustainability for our business and we can employ more people in our business when we expand" (contemporary farmers 20)*

"For me I will be able to expand my business if people start coming to our community because the environment is eco-friendly" (indigenous farmer 9)

Protection of wildlife

Participants from both the contemporary and indigenous farmers interviewed in this finding said the eco-friendly environment will protect the endangered animal species in the area and the general wildlife.

"The wildlife in our community will benefit from a good eco-system and this will be a very good thing" (contemporary farmers 13)

"There is reduction in the number of monkeys according to some of my colleagues, a good eco-system will perhaps bring the back" (local indigenous farmer8)

Findings from question 3:

What do you think not being eco-friendly in palm oil extracting business can cause?

In this section participants interviewed from both the contemporary and indigenous farmers in their findings said that not being eco-friendly in their business can lead to deforestation, destruction of the natural habitat, biodiversity loss and also extinction of some animal species in the local area.

Contribute to deforestation

Participants from the contemporary and indigenous farmers agreed that not being eco-friendly can lead to deforestation due to cutting down of trees in the local environment.

"If there is no check in tree cutting or proper tree certification is not done, then it will lead to deforestation in the area "(contemporary farmer 17)

"Deforestation will be the consequence of not being eco-friendly" (local indigenous farmer 10)

Destruction of Habitat

Participants from the contemporary and indigenous farmers interviewed said that not being eco-friendly will lead to destruction of the natural habitat in the community and this will affect the whole habitat, both humans and wildlife's.

> *"Our habitat in this community is beautiful and greenery but if we do not continue to be eco-friendly this scenery will change for the worse due to pollution" (contemporary farmer 10)*

> *"We have to protect our environment and not being eco-friendly will damage our environment in the long term" (local indigenous farmer 18)*

Biodiversity Loss

Participants from the contemporary and indigenous farmers said not being eco-friendly there will be biodiversity crisis for human health, animals and livelihoods will all be negatively impacted.

> *"The terrible impact of not being eco-friendly cannot be ignored it will impact on our livelihood and we don't want that" (contemporary farmer 12)*

> *"If we are not eco-friendly the biodiversity of our environment will be affected and both humans and animal species will be affected" (indigenous farmer 1)*

Findings from question 4:

What does your business do to promote eco-friendly practices?

Participants interviewed in this section from contemporary and indigenous farmers were asked what their businesses do to promote eco-friendly extraction business and this was the findings from the question asked.

Information workshop/Training

Participants from the contemporary farmers interviewed claim to have training sessions for their employees about their company practices and protecting the environment in carrying out their duties, they said these information's are shared regularly with them, participants from the indigenous farmers claim that their practices are eco-friendly and they do not carry out any information workshop or training.

> "*As part of our training to new and old staff, we teach them about the impact not being eco-friendly can have for our environment, so we do our best to practice eco-friendly practices in our business" (contemporary farmer 8)*

> *"Our practices are eco-friendly; these practices have been passed down for generations" (indigenous farmer 16)*

Cut down carbon foot-prints

Participants from the contemporary farmers interviewed said that cutting down on carbon imprints by businesses such as theirs which use machineries for palm oil extraction will help the environment, but most of the indigenous palm oil farmers said that they do not know much about

carbon imprint and do not have systems in place to measure it in their palm oil extracting business.

> *"As a business, we try to measure our carbon imprints, to see the amount of emission we generate in our company from our machineries by installing carbon detectors "(contemporary farmer 16)*

> *"We don't have any monitoring for our carbon imprint, if we can afford it, we will have it, as is a good idea" (indigenous farmer 6)*

Adopt Traditional Methods

Both contemporary and indigenous farmers agree the traditional palm oil extract methods is more eco-friendly but the process traditionally is very tedious and need three times more man-power to carry out the process which is very time consuming compared to the contemporary methods of using machineries.

> *"Traditional extraction practices even though are more eco-friendly is very time consuming with less output result and that is not financially viable for our business" (contemporary farmer 4)*
>
> *"I use traditional practices in my palm oil business and I believe it is eco-friendly" (indigenous farmer 18)*

4.1.2: Table 5: Theme 4: To improve and enhance the process of palm oil extraction practices of the indigenous people of Ologbo in Ikpoba-Okha of Edo State

Main Theme	Sub-theme	Contemporary Farmers	Local Indigenous Farmers
How Palm oil extraction can be done in an eco-friendly way	Stop cutting down trees	Cutting down trees is not a good practice, as this practice is done by some palm oil farmers which is not good for the environment" (contemporary farmer 12)	The cutting down of old palm trees is a practice I met as a farmer, but I don't do that anymore in my farmland, except the tree falls as a result of wind "(local indigenous farmer 5)
	Stop bush burning	There had been wildfires in the past that started from bush burning that got out of control and so I strongly oppose bush burning" (contemporary farmer 1)	After clearing our farmland, we use to burn the grass in those days, but the ministry of Agriculture has warned us against such practice because of danger of the fire spreading out of control" (local indigenous farmer 8)
	Use traditional extraction practices	There is not much evidence that the traditional extraction method protects	Our traditional extraction method uses locally made tools and does not involve

		the environment more than the ones we use, but am sure we can do more on our part to protect the environment "(contemporary farmer 14)	industrial machineries that blow fumes into the atmosphere" (local indigenous farmer 10)
	Regulation on protecting the environment	I suggest stringent regulations or laws to be added to laws already in place for farmers so as to protect the environment and the local wildlife's in them "(contemporary farmer 19)	There should be ways to stop or prevent farmers from destroying the environment through their bad practices" (local indigenous farmers 3)
	Less insecticides/Pesticides usage	We use fertilizers in our farm and due to bacteria, that can affect our palm trees we also seasonally spray insecticides in our	I know the use of insecticides can affect the environment so I avoid it in my farm land" (local indigenous farmer 14)

		farm, but in some other farms if constant insecticides are used this can affect other trees in the environment" (contemporary farmer 20)	
What will be the benefit of eco-friendly palm oil extracting business	Profits for farmers	Making profit is one of the biggest reasons we started this business and an eco-friendly environment will lead to better yields of our farming produce" (contemporary farmer 13)	If the environment is conducive for palm oil farming and extraction then my business will grow and I will make more money from my work" (local indigenous farmer 1)
	Improvement in living condition	If the environment is eco-friendly this will benefit our workers and everyone living in the environment "(contemporary farmer 11)	There is a saying in my local dialect interpreted as cleanliness is next to godliness, so an eco-friendly environment will lead to

			longevity of lifespan" (local indigenous farmer 7)
	Create job opportunities	Due to an eco-friendly environment their will, be sustainability for our business and we can employ more people in our business when we expand" (contemporary farmers 20)	For me I will be able to expand my business if people start coming to our community because the environment is eco-friendly" (indigenous farmer 9)
	Protection of wildlife	The wildlife in our community will benefit from a good eco-system and this will be a very good thing" (contemporary farmers 13)	There is reduction in the number of monkeys according to some of my colleagues, a good eco-system will perhaps bring the back" (local indigenous farmer)
What does not be eco-friendly cause	Contributes to deforestation	If there is no check in tree cutting or proper tree certification is not done,	Deforestation will be the consequence of not being eco-

		then it will lead to deforestation in the area "(contemporary farmer 17)	friendly" (local indigenous farmer 10)
	Destruction of habitat	Our habitat in this community is beautiful and greenery but if we do not continue to be eco-friendly this scenery will change for the worse due to pollution" (contemporary farmer 10)	We have to protect our environment and not being eco-friendly will damage our environment in the long term" (local indigenous farmer 18)
	Biodiversity loss	The terrible impact of not being eco-friendly cannot be ignored it will impact on our livelihood and we don't want that" (contemporary farmer 12)	If we are not eco-friendly the biodiversity of our environment will be affected and both humans and animal species will be affected" (indigenous farmer 1)
What does your business do to	Information workshops/training	As part of our training to new and old staff, we teach	Our practices are eco-friendly; these practices have been

promote eco-friendly environment		them about the impact not being eco-friendly can have for our environment, so we do our best to practice eco-friendly practices in our business" (contemporary farmer 8)	passed down for generations" (indigenous farmer 16)
	Cut down on carbon foot print	As a business, we try to measure our carbon imprints, to see the amount of emission we generate in our company from our machineries by installing carbon detectors "(contemporary farmer 16)	We don't have any monitoring for our carbon imprint, if we can afford it, we will have it, as is a good idea" (indigenous farmer 6)
	Adopt traditional methods	Traditional extraction practices even though are more eco-friendly is very time consuming with less	We don't have any monitoring for our carbon imprint, if we can afford it, we will have it, as

		output result and that is not financially viable for our business" (contemporary farmer 4)	is a good idea" (indigenous farmer 6)
	Adopt traditional extraction methods	Traditional extraction practices even though are more eco-friendly is very time consuming with less output result and that is not financially viable for our business" (contemporary farmer 4)	I use traditional practices in my palm oil business and I believe it is eco-friendly" (indigenous farmer 18)

Data taken from virtual interview

4.1.3: Table 6: Illustration of The Enabler Framework

The Lee and Choi (2003) Enabler framework developed to reflect the views of indigenous and contemporary palm oil farmers in Ologbo Ikpoba-Okha
Culture/Collaboration: According to (Mali et al., 2018) palm oil is native to West Africa, palm oil products in the past was use by Africans for weight management programs over 5,00years ago. Indigenous farmers interviewed in their findings spoke about how the traditional palm oil extraction method was better. Indigenous participant response to using the traditional (cultural) method of palm oil extraction. ***Indigenous Farmers*** *The traditional palm oil process method is better and our customers prefer it* ***(local indigenous farmer 14)*** *"Traditional methods are a hard work, but with improvement in some of our local tools the work is not as hard as it used to be years back and information's was passed around by words of mouth* ***(local indigenous farmer 4)***
Structure/Combination: There had been unsustainable development of palm oil business in Nigeria for years since the middle 1960's (Yadav et al., 2020), of recent years the federal government of Nigeria set up palm oil organisations to generate new ideas and sustainable ways of natural resources management of palm oil (Tume et al., 2019). Most Nigeria palm oil farmers tend to combine different extraction process techniques in their palm oil business. Contemporary and indigenous farmers palm oil farmers response to the structure of how their palm oil business organisation is structured and other groups support they receive also in their locality. ***Contemporary Farmer***

*"We have an organisation in our local region called Agenda 21 which has drawn out and is looking at new ways of regulating palm oil extraction "**(contemporary farmer 1)***

*"During our farmers forums or meetings, we discuss on best practices, challenges and opportunities we encounter in our line of work with colleagues from other farms" **(contemporary farmer 5 female)***

Indigenous Farmer

*"I have received visits from the state ministry of agriculture telling us how to promote sustainable farming in my business" **(local indigenous farmer 12)***

*We have our local union and, in these meetings, we share information on ways on moving forward in our business **"(local indigenous farmer 8)***

People /Skills: Most Indigenous farmers interviewed claim to have learnt their skills from observing others work and these skills have been passed down from generations, according to (Nwafor et al., 2018) these traditional skills according to him have to be developed to meet the demands of large productivity.

Local indigenous farmer

*"Most of my palm oil extracting practice I learnt from observing my father and also through words of mouth information, if we have proper documented records in the past our business would have grown much bigger by now **"(indigenous farmer 15)***

Contemporary Farmer

*"There are no proper record keeping in the past by indigenous farmers on traditional processing methods they use and this none record keeping has not advanced their practices **"(contemporary farmer 19)***

Information technology/Knowledge Creation: In the 1960's there was concern about the lack of technology in Nigeria palm oil business (Opeke et al., 2019) as a result Nigeria received from the world bank a total of $618.8million to develop technology in palm oil agriculture (Lawal et al., 2020). The local indigenous and contemporary farmers were asked about the current technology they use in their business.

Contemporary Farmers

"The technology we use in our extraction process in my company is good but it can be better with current technology in the market for our extraction process" ***(contemporary farmer 20)***

"We use Agrisoft Systems is a palm oil management program is the most comprehensive and sophisticated software solution available to the palm oil farmers in our area" ***(contemporary farmer 12****)*

Local indigenous farmer

"I get Information from local government agricultural department in Ologbo, information gathered from other local palm oil farmers in the area by words of mouth" ***(local indigenous farmer 9)***

Socialisation/Externalisation: Participants from the local indigenous and contemporary farmers were asked about the how they socialise and share information among themselves**.** There is cooperation and liaising among palm oil farmers in the farming community, information is shared among them about their practices and also with external farming bodies according to (Ekwoaba and Adekanbi, 2018)

Local Indigenous Farmers

We have our local union and, in these meetings, we share information on ways on moving forward in our business ***"(local indigenous farmer 8)***

"I do get information from the state Ministry of Agriculture to support my business" ***(local indigenous farmer 14)***

Contemporary Farmer

"We have not had an expo of recent but when we use to the ministry of Agriculture in the state do share information with us on current palm oil farming practices around the world" ***(contemporary farmer 16)***

Source Author 2022

4.1.4: Analysis of Participants Demography

This section presents its findings on the demography of participants of the indigenous and contemporary farmers interviewed looking at their gender, age, education and work experience.

Gender

Majority of the participants interviewed from the indigenous and contemporary farmers where males 35 of them and 5 females of which 2 where indigenous farmers and 3 were contemporary farmers. This huge difference in the number of males doing palm oil extracting business compared to females may be because of the work pattern, according to (Shehu et al., 2020) palm oil extraction process is a very hard work, as it involves a lot of hands on labour and the female participants from the contemporary business interviewed where in senior management levels in their business and most women over the age of 40 in Nigeria are women who have children and have to take care of their children and household as a result due to lack of childcare facility women in Nigeria may not be attracted to such means of livelihood, while the indigenous female

farmers own their own business and have the support of their grown-up children and family in doing the manual work involved in the extraction process.

Differences in terms of Age

In terms of age, majority of the indigenous farmers interviewed were (16) of them 40years and below) only (4) of them where 40 and above younger, while for the contemporary farmers (12) of them where 40 and above and the remaining (8) where 40 and below older, this shows that compared to the indigenous farmers, the contemporary farmers are younger, this can show why they prefer the contemporary(machinery operated) palm oil extracting process, according to (John and Oyewobi, 2018) in the traditional palm oil extracting process most of the information are passed down by words of mouth from generation to generation, this could be a reason why the decline in the age demography as information's are lost in transmission due to an aging population.

Differences in terms of participant Education

There was a huge difference in terms of educational qualifications obtained between the indigenous farmers compared to the contemporary palm oil farmers, of the indigenous farmers (9) had only primary school leaving certificate and the remaining (11) had secondary school leaving certificate as their highest educational achievement, compared to the contemporary farmers with a total of (20) of them having a minimum of a university first degree and above for some.

This variation in their educational qualification can be a reason why most of the contemporary farmers interviewed have KM software's (Lawal et al.,2020) said the government of Nigeria has put in money into the palm oil extracting business to develop their extraction practices, most of the indigenous farmers do not use any KM software in their business

Differences in Work Experience

In this finding, majority of the indigenous farmers have spent over 10years in their extracting business, their experience span over 10years (19) of which only (1) has less than 10years experience compared to the contemporary farmers of which only (5) of them have over 10years work experience and the remaining (15) have between 1-10years highest work experience, this could be due to the fact that the using of technology in palm oil extraction in Nigeria started in 1960, (Opeke et al., 2019) when the world bank gave Nigeria $618.8million to develop the technology used in palm oil farming, hence a lot of the contemporary palm oil farmers have less work experience compared to indigenous farmers who have been using looking tools to do their extracting business for years before the advent of technology in Nigeria palm oil extracting business (Dlamini et al., 2018).

Chapter 5

Discussion of Findings

5.0: Introduction

This chapter will discuss the findings presented in chapter 5; the discussion will attempt to reflect discussion undertaken by previous researchers to support the findings in this chapter. The discussions in this chapter will be structured in accordance with the research objectives.

RO1 – To understand and highlight the historical KM practices of palm oil extraction of the people of Ologbo in Ikpoba-Okha of Edo State Nigeria-the specific ways information was gathered, stored and disseminated.

RO2 – To understand and highlight the current practices of palm oil extraction and KM of the small and medium produces of Ologbo in Ikpoba-Oka of Edo State Nigeria.

RO3 – To use the historical practices , of the people of Ologbo in Ikpoba-Okha to generate new ideas and find new sustainable ways of natural resources management of palm oil extraction.

RO4 – To improve and enhance the processes of palm oil extraction practices of the indigenous people of Ologbo in Ikpoba-Okha of Edo State in an eco-friendly manner.

RO5 – To develop a framework that will help to bridge indigenous and current knowledge management practices of palm oil extraction.

5.1: Discussion of Finding for Theme 1:

To Understand and highlight the historical KM practices of natural resources of (palm oil extraction) of the people of Ologbo in Ikpoba-Okha of Edo State Nigeria – the specific ways it was gathered, stored and disseminated.

The findings on this research objective was to identify how information was stored and passed down in the past by both contemporary and indigenous palm oil farmers, what their concerns about the way palm oil extraction was done in the past, what the local and traditional practices incorporated in palm oil extraction, what was good and not liked about the traditional palm oil extracting process, made the researcher to discover more sub-themes from the interviews what training if any was given to the farmers, the work involved in those days in the extraction process and its impact on the farmers.

Lack of technology in the Past

The findings in this section are consistent with other past literatures, according to (John and Oyewobi, 2018) due to lack of technology in the past information was passed down and disseminated by palm oil farmers through words of mouth, information passed down from their parents and grand-parents, these information's were not recorded, information's such as how to grow palm trees or how to get good harvest yields, the local farmers had this knowledge based on indigenous practices of their parents which supports this finding, The indigenous farmers interviewed could not point the researcher to any recorded documentations either in the local library in the community or their personal records of their traditional practices they used in their extraction process, this could be due to the fact that majority of the indigenous farmers only have secondary school leaving certificates, they are not well educated which is likely same for their parents..

Traditional Practices of Palm oil Processing/ Lack of training and KM information

Other findings in this section were also collaborated with what (Chendov, 2018) discovered that a lot of the palm oil processing in Nigeria in those days were done in the local way (traditional)method, as most of the farmers could not afford machanised machinery and it accounts for the weight or bulk of palm oil processed in Nigeria, this could be due to not having access to banks or government loans because of the process involved or going through the application process due to lack of higher education and know-how, also operating these machines need some form of training to operate which the contemporary farmers undertake through training and supervision for their employees to do but the indigenous farmers do not have such training other than observing their parents or relatives work..

There were no training and proper way of sharing KM of palm oil extraction process by farmers in those days in Nigeria and this finding is supported by literature, according to past literature (Chendov, 2018), William Hesketh Lever (founder of Unilever) in 1907, 1920, and 1925, a pioneering organisation, was said to have failed to train local farmers or support them to build better palm oil farms around Nigeria. The pilgrims' government in those days the (British colonial government) was not entirely convinced that agricultural goods using palm oil would be created “by the indigenous peoples” under West African conditions and would not be accepted as a “central standard” by the local population, (Kayode et al., 2017). Since the late 1950s, efforts by the Nigerian government to arouse new interests in the palm oil business have been thwarted by high prices for farm lands, (Tharakan, 2017).

Lack of Training Protocols/Regulations

Also, in the past there was no training, model or protocols created by the Nigeria government or local farmers on how to do palm oil extraction little support only started coming from the Nigeria

Agricultural department, in 1938, only 5,530 of the almost 1,000,000 farmers in Nigeria planted palm oil seedlings, which give them all 9,213 acres of land was used in farming their palm oils (Jellason et al., 2021).

It was discovered by the researcher in this section that due to lack of regulation in the palm oil extracting business in Ologbo Ikpoba-Okha that although the method of harvesting cannot improve the quality of the palm produce, but if there was some form of regulation in the past it could prevent or limit destruction of palm seeds, (Gope et al., 2018).

Lack of government regulation in palm oil extraction, meant contemporary and local indigenous farmers could undertake illegal and wrong palm oil extraction practices, which in most cases put profits ahead of lives of people who consume contaminated palm oil products, hence Nigeria palm oil is bound in some countries, (Jellason, 2021).

Rigorous Work/Physiological and Physical hazards

The researcher also discovered that both contemporary and indigenous palm oil farmers complained about the rigorous work involved in palm oil extraction practices in the past and this finding can be corroborated to the research that occupational hazards which include burnout, fatigue, risk and illness in palm oil extracting production done in the past had their effect on the body of palm oil workers according to (Shehu, et al., 2020), according to him palm workers during extraction tend to incur injuries on the one hand, due to physical loads, or during operation or using of tools or machineries for extraction.

Also, during field work during palm oil extraction in the past, high temperatures cause discomfort and abundant sweating, which is counteracted by drinking water to avoid cramps or dizziness, the heat is so great that “sometimes it is difficult to work all day with the mask because the work is quite hectic, with the days that are very sunny one feels fatigued, so there are times when one does not use it, sometimes it is take off for a while (Johnson, 2019).

There is also the hazard of chemical used, direct contact with products applied to crops (pesticides, for example) stand out. Physiological hazards during extraction of palm oil

associated with posture, repetitive motion efforts, or manual load handling are equally common ((Brondízio, et al., 2021).

The working terrains of most palm oil farmlands in Ologbo Ikpoba-Okha are said to be very slippery and difficult to navigate (Jellason, 2021), added to the weight of the palm brunch the farmers have to carry during the process of fruit collection, maintenance and pollination this are all added risk the farmers have to undertake mostly the indigenous farmers who cannot afford tractors to collect their harvest.

Lack of Government Support/KM software's

The researcher was able to collaborate findings from what the contemporary and indigenous farmers said that sharing KM of palm oil extraction in the past was very difficult due to lack of government support since the late 1950s, new interests in the palm oil business have been thwarted by high prices for farm lands and the acquisition of lands by local farmers for expansion posed difficulty due to financial constraints, (Tharakan, 2017).

Only of recent is the state ministry of Agriculture started supporting indigenous farmers in applying for loans and making the process less tedious for them, (Tharakan, 2017), with this in mind, the local government should look further in training and teaching the local farmers how to use KM software to help them develop their extraction practices.

No farming Unions/Financial Incentives

In the past there were no farmer unions, most palm oil farmers were family members and their businesses were supported by their neighbors or family members (Chukwu et al., 2020).

Not until the Palm oil Growing Ordinance was issued in 1935 in Nigeria, which offered little financial assistance to farmers to set up a plantation and gave them the opportunity to reclaim the preferred farming obligations (Jellason et al., 2021).

From the interviews carried out and based on literature search , both indigenous and contemporary palm oil farmers in Ologbo Ikpoba-Okha, still do not have models they use to do their oil palm business, but some SMEs and medium size farmers in Ikpoba-Okha have their individual company models they have developed to do their palm oil farming (Makate, 2019), for sustainable development in the palm oil sector in Ologbo Ikpoba-Okha developing a framework such as the (Lee and Choi 2003) adapted Enabler framework can be used by both contemporary and indigenous farmers in the region and in developing countries around the world.

Washing of Palm Seeds after Harvest

Another KM palm oil extracting process used in the past according to both the contemporary and indigenous palm oil farmers, palm seeds are washed or disinfected prior to extraction and this finding is backed up by (Chukwu et al., 2020), palm oil is produced in a variety of ways, from modern processes to more traditional methods of preparation which involve seed washing or disinfectant in both cases.

Also (Yulianti et al., 2018), found that both indigenous and contemporary palm oil farmers combine both traditional and machanised ways in washing or disinfecting their palm seeds before extraction.

The washing of palm seeds before extraction from literature and explanations of the farmers (indigenous and contemporary) was a necessary action to prevent insects and bugs larva from

getting into the oil when is being processed as this can be harmful or lead to discoloration of the processed palm oil, hence is very necessary.

5.2: Discussion of findings for Theme 2:

Discussion of finding: To Understand and highlight the current practices of palm oil extraction and KM of the small and medium producers of Ologbo in Ikpoba-Okha of Edo State Nigeria.

In this section the findings are based on the participants response which is backed up by literature on current KM practices of palm oil extraction used by small and medium palm oil farmers, the systematic extraction processes involved (**See Appendix 9 for systematic Extraction process followed**), current training in place for the farmers, what incentives or training are involved and the current management software systems being used by the farmers in the area.

Systematic Extraction Process

The findings on the current practices of palm oil extraction and KM of the contemporary and indigenous farmers in the research showed that a systematic operational process (**See Appendix 9)** is used and this is supported by (Purwanto, et al., 2020) who explained this systematic process as follows for contemporary farmers processing methods, oil is extracted from the almond of the palm fruit by mechanical pressing or chemical process, with the use of solvents. In current physical methods, extraction is carried out using a press at the end of the process. before pressing, the nut is heated with indirect steam in order to reduce moisture. The whole fruit is heated and then transferred to a compartment, where the pulp is separated using screen filters and an agitating mechanism. The rest of the fruit, skin and almonds (whole and unpeeled) are put in a hydro cyclone machine (**See Appendix 10 for extracting machine with hydro cyclone**), where they are separated. The skin is used to produce feed or waxes, while the almond is sent to a new

separator machine, where the skin is removed, which is then sent to the boiler. Finally, the whole almond is pressed to extract the palm kernel oil. Oil is extracted by a mechanical pressing process.

Some companies also use technology to extracts oil from the fruit of the palm tree, known as a separator to divide and direct the almond and the pulp.

The findings of the current practices of contemporary farmers when it comes to palm oil extraction is also supported by (Shehu et al., 2020) who explained the process as follows" the seeds are heating in a machine so as to separate the shalves from the seed after this process it is then put in the deaerator (a machine) where the oil is filtered to remove any cake residues that may be there, and then the substance is stored in tanks at a constant temperature of 50°C, in order to avoid solidification of the palm oil. However, at room temperature, it appears in a pasty form with a whitish colour. When in a liquid state (just heat it in a water bath) it is a slightly yellowish oil.

Jezeer, et al., 2019, corroborated the finding of the local indigenous farmers who said palm fruits are picked and then heated by steam in a drum or big pot in order to soften the pulp to facilitate the extraction of oil and partially shrink the almonds, which facilitates the separation of their skin, the fruits go through a locally made digester or pounded in a pestle (**See Appendix 8, for local extraction process)** forming a mass that is pressed, from which crude palm oil is extracted, at this moment, the crude oil from the fruit is kept in containers prepared for sale, while the fruit pie which is the mass of pressed fruit without the crude palm oil, containing the nuts (shell and almond) - will start the palm kernel oil extraction process.

The systematic extraction process is only used by the contemporary farmers who are the ones who can afford such machanised machines (Jezeer et al., 2019) and are also capable of investing in training their employees on the use of the machines and maintenance of such machines will prove to be too expensive for most of the indigenous palm oil farmers. Indigenous farmers in the locality using traditional extraction practices.

Training Giving

Training is also a very important part of current practices of palm oil extraction according to participants interviewed and this finding is backed by research according to (Abdulkadir and Maifata, 2017), extraction of palm oil is a skill that is learnt, palm oil field by medium or bigger palm oil industries, has a large number of global manufacturers ready to provide equipment that can move from 10kg to several tons per hour and these machineries need training to operate them. (Suurshater and Tope, 2019). Several SMEs and medium palm oil companies (contemporary farmers) have production rates from two hundred to three hundred kilograms to eight tons of palm oil output per day deliver palm oil to the domestic market need trained experienced workers to operate these machineries, but this is not the case for indigenous farmers who still use traditional methods of extraction and do not require raining to carry out their practices.

Ogar et al., 2020, most African palm oil producing contemporary palm oil businesses have developed small mechanical and automated fermenters handled by people (who are trained to handle them).

KM Software's

According to most of the contemporary farmers interviewed also use KM software in their business and this finding is supported by (Majekodunmi, 2018) when he said technology with regards to palm oil farming and extraction has improved a lot mostly with SMEs and Medium sized (contemporary) palm oil farmers, these business are able to obtain and look at researched based data's that help them in the way palm oil farming can be doing successful to increase yield., due to technology palm oil farmers are able to know things such as, if the oil content of

palm seed is extremely low in the early stages of its development, as the palm seeds developed, the distribution of the oil increases rapidly, reaching around 50% of the Mesocarpar.

In the case of Ologbo Ikpoba-Okha, the contemporary farmers use Agri-soft KM software to educate and train their employees and also on looking at best and current practices when it comes to palm oil extraction. Also (Mohammed et al., 2019) said most palm oil farmers in Nigeria tend to use Agrisoft systems in their KM storing information, these database applications are suitable for the palm oil agronomy industry, as it helps them with the advanced thematic mapping tool and a reliable data filtering and analysis tool. Database applications also include reports and infographics. All of the applications are based on the same set of core concepts

5.3: Discussion of findings for Theme 3:

To Use the historical practices of (KM) of the people of Ologbo in Ikpoba-Okha to generate new ideas and find new sustainable ways of natural resources management of palm oil extraction.

The findings in this section based on what the indigenous and contemporary farmers said in their interview on ways of generating new ideas and finding sustainable ways of natural resources management of palm oil extraction.

Development of regional way of Palm oil Extraction.

According to (Varkkey, et al., 2018) a new model of regional development that uses the fantastic natural heritage without destroying it is has been developed in Nigeria.

In the case of Ologbo Ikpoba-Okha, this translates into the sustainability of a forest economy, into social sustainability marked by a historical demand for access to land and credit, the sustainability of nature and into political sustainability without which there is no development.

An important effort towards sustainability is the implementation of various zoning modalities aimed at organizing land use on a techno-scientific basis.

The participants from the contemporary farmers also mentioned having a regional zoning system for palm oil extracting farmers in the local government area (Herdiansyah, et al., 2020) is helping them to be able to speak to other farmers and people in the region about their palm oil businesses and having various zonings will contribute to sustainable of their business and enable them to look at other ways of palm oil extraction with a look at different scales, each one of them revealing important skills and/or restrictions in the use of land for farming and expanding the knowledge necessary for the action. For example, the Forest Code is based on the scale of the property, establishing rules for its use such as Legal Reserves and Permanent Preservation Areas. The Agroecological Zoning is a fundamental tool to create mechanisms to guide and implement production chains by indicating the most suitable land for agricultural production.

Ecological-Economic Zoning (ZEE) is considered as the most important instrument of environmental management for aiming at the ordering of land use relating to socioeconomic conditions and ecological conditions, has been implemented in the Ologbo Ikpoba-Okha at the state.

Certification of Palm Oil

Another finding from the research is the issuing of certification of palm oil, (Higgins, and Richards, 2019). In the Ologbo community, there is a general agreement to establish certification as a sustainable criterion adopted by the market, however, the observations made about the difficulty of certifying palm oil, whether in the context of plantations or in processing, are valid in the Ologbo Ikpoba-Okha regarding wood certification reveal that certification is very expensive and that there are few certifying institutions, making it a difficult process for small producers to access. It is not by chance that Indonesia was only able to start its own audit with the help of Norway. There is, therefore need, to innovate in ways to achieve sustainable production. Facing up to the aforementioned challenges must contribute to this end. The challenge of ensuring the presence of small production. It is frequent in the country that good

programs and their instruments are applied in practice. Small producers involving family farmers and communities need to be able to access both credit and technical assistance, and land tenure has been an essential condition.

The question arises – is it possible to control the ongoing land sale process? Another problem is the fast time required between collection and processing and the high cost of processing investments in plantations, which necessarily benefits the large ones and penalizes the small producers, getting around this will be difficult hurdle for the indigenous farmers based on the fact that most of them claim they cannot get credit or loans from banks. The organisation of cooperatives is a solution that many of the famers interviewed spoke about that can help them to support each other, example of such ideas in Ologbo Ikpoba-Okha is the organisation of agro-industrial farms made up of 20 to 50 producers, located in areas with access to shipping and the palm oil market (Nicholas, et al., 2018).

Trading in the global Market

Participants from both the contemporary and indigenous farmers in their findings talked about the issue of having access to the global market, (Giacomin, 2018), it is fundamental and necessary to innovate promoting biodiversity in the plantations. This is the view of all the farmers interviewed from contemporary and indigenous farmers, they want to be able to sell their products on the global market but to make this a reality the federal government of Nigeria needs to do more to support the palm oil farmers in the region..

5.4: Discussion of findings from Theme 4:

To improve and enhance the process of palm oil extraction practices of the indigenous people of Ologbo in Ikpoba-okha of Edo State of Nigeria in an Eco-friendly manner.

Improve living Standard

The findings in this section are supported by what (Guiriba, 2019) said that an eco-friendly palm oil extracting business will improve standard of living in the local environment, it will also create job opportunities and lead to financial profits for the palm oil farmers and this kind of improvement and wealth distribution will be better for the Ologbo community.

Palm oil supporters believe that their products reduce unemployment, alleviate poverty, and offer natural benefits (Yadav et al., 2020). In Nigeria, for example, palm oil exports oil is one of the country's strategic advantages in the world market and has contributed to the country's economic development.

Palm tree certification/Protecting Environment

According to (Adeniran et al., 2020), in order to improve and enhance the process of palm oil extraction practices of the indigenous people information should be shared to the local indigenes of the importance of protecting their habitat, this will help the palm oil farmers in the locality if taught to also be able to monitor their carbon footprints and this should include tree certification and regulations to protect the local habitat.

Conclusion

This research investigated how the use of enabler framework of (Lee and Choi, 2003) will help to develop knowledge management practices for indigenous and contemporary palm oil producers in Ologbo Ikpoba-Okha of Edo state, when it comes to culture and collaboration using the enabler framework, the study found that traditional palm oil processing method is better than contemporary methods as it leaves less impurities in the oil, the study also found similarities also in practices of indigenous and contemporary farmers according to (Tume et al., 2019).

This research also showed that in the past information used by indigenous farmers were passed down from generations by words of mouth (John and Oyewobi, 2018), prior to 1960 most palm oil extraction done in Nigeria were done the traditional way (Chendov, 2018). Both indigenous and contemporary palm oil farmers have organisations and forums that helps them to regulate their business and generate new sustainable ideas to manage their business, similarly also according to the findings.

The research also found that current palm oil extraction practices use technology to carry out systematic operational process of palm oil extraction (Purwanto, et al., 2020) and these technology and machineries need training and experience to operate them, (Suurshater and Tope, 2019)

According to (Nwafor et al., 2018), contemporary farmers use technology for their extraction process. The findings also showed that information technology of KM software's was used by contemporary farmers compared to indigenous farmers perhaps because most indigenous farmers in Ologbo Ikpoba-Okha tend to only have primary and secondary school certificate compared to contemporary farmers who were mostly university graduates, indigenous farmers in Ologbo will need to learn to start using KM software for their business to increase their organisation performance as it was reflected by contemporary farmers in the findings that when it comes to organisational performance as contemporary farmers saw financial increase due to their adopting the KM software's for their business.

The findings also found that using sustainable palm oil practices will generate new sustainable ways of natural resources management of palm oil extraction. Also having regional zoning systems in the community for palm farmers is a sustainable way in the process of supporting farmers to generate new sustainable ideas, (Herdiansyah, et al., 2020).

The findings also suggested certification of palm oil as a sustainable way of generating new ideas (Higgins and Richards, 2019) as certification will make palm oil farmers adopt cleaner palm oil processing practices.

The findings also found that an eco-friendly extraction practice will improve standard of living in the local area and also create job opportunities and financial prosperity to businesses (Guiriba, 2019,) an eco-friendly extraction process is adopted.

Contribution to Practice

This research has extended the (Lee nd Choi, 2003), enabler framework by exploring it within IK and contemporary debate, with the way the framework was used, it was able to differentiate historical practices of palm oil extraction and contemporary practices using the KM tools used by contemporary palm oil farmers and information passed down from generation used by indigenous farmers.

Secondly, the investigative approach has highlighted areas such as KM practices of indigenous farmers and those of contemporary palm oil farmers and areas where IK is especially weak when it comes to development in the technology and lack of usage of KM software tools that documented historical and current practices of palm oil extraction and how the usage of technology and KM software can improve KM among palm oil farmers in Ologbo Ikpoba-Okha.

Thirdly, this study has contributed to KM from a developing context as Nigeria is a developing country and the study of KM is dominated by Western literature (Abioye, et al., 2017) and so the

study of IK will contribute to IK practices of palm oil extraction in both developing and developed economy.

Fourthly, this study, will highlight the environmental issues associated with palm oil extraction around the world because palm oil production is currently one of the main causes of the world's destruction of tropical forests, (Khatun, et al., 2020). Palm oil extraction has led to deforestation in a lot of developing countries this study has highlighted the advantages of eco-friendly palm oil extraction methods.
Furthermore, how the indiscriminate use of pesticides and fertilizers can cause serious impacts on aquatic biodiversity if eco-friendly palm oil extraction practices are ignored (Pratama, et al., 2021). in addition to palm oil extraction being one of the main drivers of human-induced climate change hopefully due to this study big palm oil brands in developing countries around the world will commit to using only responsible palm oil, produced without causing the destruction of tropical forests which are rich in carbon (Varkkey, et al., 2018).

Finally, the study had been able to explore KM in the agro business sector of Ologbo in Ikpoba-Okha area of Edo State Nigeria and hopefully will influence traditional palm oil extracting methods usage of KM software's in their businesses.

Implication to Practice

This research has highlighted areas that will help policy makers develop strategies for supporting IK famers in the area of KM, both indigenous and contemporary farmers will be able to record their past and current experiences and techniques to develop more their practices of palm oil extraction. According to (Jezeer, et al., 2019) traditional palm oil processing methods are mostly passed down by words of mouth to the farmers from their parents and this has been the practice

for generation, but this research shows to indigenous palm oil farmers in developing economies around the world that if these IK practices are documented using knowledge management software their practice will develop and with such development their business can become more sustainable in the long term.

Secondly, both Indigenous and contemporary palm oil farmers have identified areas that they face challenges and this can be a starting point to tackle the issues knowledge management software's to improve their practice of palm oil extraction.

Thirdly, Nigeria palm oil is still barred from some countries in the world due to impurities in the processed oil and lack of proper palm oil regulation, the benefits of an eco-friendly agriculture cannot be overstated, (Guiriba, 2016) said that doing an eco-friendly palm oil extraction business will not only help the environment, it will lead to good quality processing methods and create opportunities for new jobs, bring about financial and economic development to an area. Through this research, it will help both contemporary and indigenous farmers to see the benefits of eco-friendly practices in their palm oil extracting process.

Lastly- with the high unemployment in Nigeria, the enabler framework could serve as a guide developing KM policies for local palm oil farmers.

Recommendations

To Improve and enhance the process of Palm oil extraction of the people of Ologbo Ikpoba-Okha in an Eco-friendly manner

The following should be taken into consideration, palm oil production is currently one of the main causes of the world's destruction of tropical forests, in addition to being one of the main drivers of human-induced climate change big brand palm oil companies should commit to using only responsible palm oil, produced without causing the destruction of tropical forests, rich in carbon (Varkkey, et al., 2018).

Traditional palm oil processing method is said to be more healthy option than machanised extraction process, as studies have revealed, traditional method is better as it is less oxidized palm oil which is used by the food industry and this induces an adverse lipid profile, free fatty acids, phospholipids and cerebrosides. Oxidized palm oil can also cause organ toxicity, particularly the kidneys, lungs, liver and heart (Herdiansyah, et al., 2020). Available evidence suggests that at least part of the health impact of oxidized palm oil reflects the generation of toxins due to oxidation, hence traditional method of palm oil extraction is better.
It is believed that a lot of palm plantations were developed without prior consultation with local communities about land use and this somehow responsible for removing native populations from their lands.

In 2010, the Federal Government of Nigeria launched the Sustainable Palm Oil Production Program, which seeks to make the production of oil from palm sustainable and contribute to the preservation of the rain forest. This program prohibits the deforestation of natural vegetation for the planting of oil palm, allowing only the planting and expansion in already deforested areas. hence, political vulnerability has become another element to consider in oil palm production, as the big palm oil companies lobby and buy their way in government, local community should form groups that takes the needs of the community and seek representation in government.

Also, the researcher recommends that companies and buying countries should pay attention to the way in which palm oil production takes place, and producing countries should not fall prey to the uncertainty of markets including demand suppression and price manipulation.

Some of the SMEs and medium size farmers interviewed suggested that a new model of regional development that uses the fantastic natural heritage without destroying and improving the eco-friendly area is necessary, a "sustainable development". In the case of the Ologbo Ikpoba-Okha, this translates into the sustainability of a forest economy, social sustainability marked by a historical demand for access to land and credit, into the sustainability of nature and into political sustainability without which there is no development, (Herdiansyah, et al., 2020).

To use the historical practices of (KM) of the people of Ologbo in Ikpoba-Okha to generate new ideas and find new sustainable ways of natural resources management of palm oil extraction.

To generate new ideas and find new sustainable ways of natural resources management of palm oil extraction in Ologbo, there should be ways of controlling the ongoing land sale process in the local government area which will put a curb to the menace of land sales that is not currently properly regulated in the state, another problem that needs to be resolved is the fast time required between collection and processing of the high cost of processing investments in palm oil plantations in the Ologbo Ikpoba-Okha area, which will benefits the large and contemporary palm oil farmers and penalizes the small indigenous (traditional) farmers. To solve this problem, organisation of cooperatives such as the Agenda 21 group should agree on regulatory ways to help the farmers.

It is also suggested by the researcher that the organisation of agro-industrial farms made up of 20 to 50 producers, located in areas such as the case of Ologbo in Ikpoba-Okha with access to roads and the market (Nicholas, et al., 2018). Can form an integral part of this form of organisation to be the industry that regulates the whole process of palm oil extraction in the local

government area that not only processes palm oil, but also biodiesel, because without an industry there is no condition for business survival.

Biodiesel is an area that palm oil farmers should consider to produce biofuel, considering that the price of palm oil in the market is higher than that of biodiesel, so far producers have been selling palm oil, there is a risk that producers will continue to produce largely just palm oil. The issue of access to the global market is fundamental hence renewable sustainable ways of palm oil business should be considered of which biofuel is one.

Palm tree certification is another area to consider, there is general agreement to establish certification of palm oil trees in Ologbo Ikpoba-Okha as a sustainability criterion, (Higgins, and Richards, 2019).

Government should regulate palm oil plantations, the rapidly expanding demand for palm oil has resulted in massive deforestation. Increasingly, oil palm plantations are increasing, and the industry is creating place for them by razing environmentally sensitive habitats such as rainforests, mangroves, and peatlands. Palm oil-related deforestation is a big problem in Nigeria.

Burning of trees by oil palm producers and those who employ illegal and unsustainable methods, such as land occupation, illegal burning of forests, plantations without valid permits, and the use of cheap or slave labor should be discouraged.

Further Research

The global world palm oil companies are facing challenges as a result of deforestation, habitat destruction and like other sector of Agriculture people are looking at more sustainable way of doing palm oil extraction, hence there is need for researchers to do research on Ologbo Ikpoba-Okha to look at the use of palm oil for biodiesel(biofuel) for renewable energy as that seems to be the future green energy.

Environmental impact of palm oil extraction business in Ologbo Ikpoba-Okha of Edo State is a big issue, researchers can look at the long-term impact of palm oil extraction in the state or in developing countries.

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Appendix 1: PG2: Ethics Approval form

EC895 PG2 Ethics Form Approved: DORE-OKUOIMOSE, MARY MENA (1806652)

Postgrad Research
Wed 28/07/2021 08:24

To: Mary Mena Dore-Okuoimose (1806652) **+1 other**
Cc: John-Paul Okeke **+3 others**

Dear Mary Mena Dore-Okuoimose,

I am pleased to confirm that the submission of the Ethical Approval on your research 'Indigenous Knowledge management practices looking at the historical perspectives of palm oil extraction in Ologbo Ikpoba-Okha of Edo state Nigeria' has been **APPROVED** by the University's Ethics Committee.

Please ensure that you are aware of, and use, the University's Research Data Management Policy and the extensive resources on the University's Research Data Management web pages (http://uwtsd.ac.uk/library/research-data-management/).

Please do not hesitate to contact the office should you require any further information on this matter.

Kind Regards

Steve Davies

Swyddfa Academaidd (Graddau Ymchwil Ôl-raddedig) / Academic Office (Postgraduate Research)
Campws Caerfyrddin / Carmarthen Campus
SA31 3EP
Ext: 4464
steven.davies@uwtsd.ac.uk

Appendix 2: Participant Consent Form

PARTICIPANT CONSENT FORM

RESEARCH PROJECT: INDIGENOUS KNOWLEDGE MANAGEMENT PRACTICES: LOOKING AT THE HISTORICAL PERSPECTIVES OF PALM OIL EXTRACTION IN OLOGBO IKPOBA-OKHA OF EDO STATE OF NIGERIA.

RESEARCHERS NAME: Mary Mena Dore-Okuoimose

RESEARCH TEAM/ SUPERVISORS: Dr. D Gladius & Dr. Dennis Pepple

- I have read the participant information sheet and the nature and purpose of the research project has been explained to me. I understand and agree to take part.

- I understand the purpose of the research project and my involvement in it.

- I understand that I may withdraw from the research project at any time during the data collection phase. Upon conclusion of the field work, the research will notify all participants via email that the study has come to an end. Participants will have a period of 24hours from the time the email is sent to withdraw their data, after which point it will not be possible to withdraw the collected data. Please note: all data collected will be coded and once analysed, will be made anonymous. Please provide an email address for this purpose here.

……
……

- I understand that while information gained during the study may be published, I will not be identified and my personal results will remain confidential.
- I understand that I will be audio recorded during the interview.
- I understand that data will be stored by the researcher in a locked and secured cabinet. Any audio recording for audit and checking purposes only. If any further access is required, the researcher will contact the participant in writing.
- I understand that I may contact the researcher or supervisory team if I required further information about the research. I may also contact the educational institution, if I wish to make further enquiry relating to my involvement in the research.

Signed……
…… (Research Participant)

Print
name…….
Date……..

Contact details:

Research team/supervisors :(name and email)

Please return form to: (email)

Appendix 3: Interview Transcript from Contemporary farmer 11

S/N	PARTICIPANT ID	GENDER	QUALIFICATION	POSITION	PALM OIL FARMING EXPERIENCE	STATE OF ORIGIN	AGE
11	Contemporary palm oil farmer (31)	Male	Bachelor Degree	SME Palm oil farmer	24years	Edo State	50 and below

1) How was Information stored in the past on palm oil extraction process?

Reply to question 1: (Contemporary palm oil farmer 11): There was no proper information storage system in the past. We need to improve IT systems for storage of information on our farm yields.

There were no training or information given in the past on palm oil extraction to farmers in the locality on the use of IT system on Knowledge Management of storing and sharing of best practices when it comes to extraction, information's used by farmers in the past was by words of mouth. If farmers in the past in the locality had trainings, I believe this will have improved their businesses and practices.

From what I heard information storage system in the past was none existent in most cases, mostly among indigenous farmers. We need to improve IT systems for storage of information on our farm yields (contemporary farmer contemporary farmer

2)What are your concerns about the way palm oil extraction was done in the past in your opinion?

Reply to question 2: Contemporary palm oil farmer 11: It was a common practice I know of that still happens that during extraction there used to be incidents of oil spillage that resulted in burn and this practice posed a lot of risk to farmers due to, farming terrain, insecticides, workload, lack of proper tools for the local farmers or machinery for the contemporary farmers to use during extraction and this resulted into a lot of accidents during extraction process.
There where no government support with regards to finance such as loans or any educational support for palm oil farmers that I am aware about in those days in Ologbo
Palm oil farmers had to support their businesses from their own resources or get financial support from their families and friends.
We had no regulations in those days to support palm oil farmers on what is acceptable or unacceptable when it came to farmland destruction such as burning trees or tree certifications.
Palm oil is regulated these days in Ologbo Ikpoba-Okha but not so in the past.
According to this finding by both Contemporary and indigenous farmers interviewed said although extraction of palm oil is still not properly regulated to date in Ologbo Ikpoba-Okha, it was worse in those days.

3) What are the local and traditional practices incorporated in your palm oil extracting process in the past?

Reply to question 3: Contemporary farmer 11: The traditional methods we incorporated in our palm oil extraction process in those days was to rinse or disinfect the palm seed by water prior to extraction.

A lot of contemporary businesses have machineries they use, some for disinfecting the palm seeds and washing them to prevent bugs from being processed with the palm seeds.

In the past we had no certification of palm oil in the region and as a result a lot of palm oil farmers where cutting corners which lead to bad practices in the past when it came to palm oil extraction.

4) What do you think was good about the past(traditional) extracting process?

Reply to question 4: Contemporary farmer 11: The traditional palm oil processing methods in those days cared about the local wildlife, farmers care about the environment and trees where not cut indiscriminately.
But these days a lot of companies do not care about the local habitat as much as they care about the financial gains for their businesses.

Also, traditional palm oil process compared to machined extracting processing contained less impurities. Farmers who use the traditional palm oil extraction methods tend to have cleaner and better palm oil after processing it the traditional way, but they cannot extract their oil in bulk supply due to lack of man-power and mechanized machinery

5) What don't you like about the past (traditional) extracting palm oil process?

Reply to question 5: Contemporary farmer 11: The traditional extracting process was too tedious and less profitable due to the traditional tools used and the work process is quite rigorous otherwise I believe they produce a better-quality palm oil.

6) What are the Current Palm Oil Extraction processing your business Use?

Reply to question 6: Contemporary farmer 11: In our business currently, we use a systematic operational process. We follow several mechanical and chemical pressing process we follow

after we have done our seed heating which is done using indirect steaming. From the gathering of the brunches after harvest to the seed's sterilisation, to palm extraction it is all done systematically.

7) What Current Training are in place for extraction process in your business?

Reply to question 7: Contemporary Farmer 11: We do have in-house job training to either operate the extraction machines or training on the extraction process and these trainings can sometimes last between 6 to 12months depends on the area of work in the business the employees are working and for some other employees who have had previous training prior to joining there in-house training is shorter between 2-3months.

8) Apart from training what other Support Systems are in Place for Your Staff/employees?

Reply to question 8: Contemporary farmer 11: In my business we have support systems in place for our employees, which apart from training and staff support systems we have incentive linked staff performance which we give yearly in the form of staff bonuses and hardworking staff are recognised during our annual Christmas party.

9) What Knowledge Management Software or data do you have that helps to inform your business of best practices when it comes to your business?

Reply to question 9: Contemporary Farmer 11: My business use Agrisoft Systems which is a palm oil management program and it is a very comprehensive software system and it is easy to manage by our IT department and I think most medium and SMEs palm oil business in this region and country use this Agrisoft system.

10) How has the knowledge Management (KM) your farm used influenced or affected the way your company manage its business?

Reply to question 10: Contemporary Farmer 9: knowledge management has influenced the way our do business in terms of profit, knowledge sharing among staff, Maximising their resources.

We have seen increase in our profits as a result of using KM system in our business and also the systems have helped us in choosing better farming styles for our palm oil farming and as a result also, we have good harvest since developing our KM systems, our business has been able to cut down on ordering the wrong materials due to easy access tour inventory which is constantly updated in our IT system.

11) How do you share your knowledge or practices with similar palm oil farmers in your local community?

Reply to question 11: Contemporary Farmer 11: My business share information with other palm oil farmers in the region during local palm oil farmers meetings and local forums, during these meetings, we discuss good palm oil farming and extraction practices, challenges and opportunities we face and encourage ourselves. We also use our company websites where we post our latest company information such as company performance, employment vacancies, product selling prices and company annual performance records.

12) How does your business generate new Ideas and sustainable ways of natural resources management of palm oil extraction?

Reply to question 12: Contemporary farmer 11

My business generates new ideas and sustainable way of doing business using our Agrisoft knowledge management software and also sharing ideas with other farmers in our region.
We have an organisation in our local region called Agenda 21 which has drawn out and is looking at new ways of regulating palm oil extraction and sustainable way for farmers in the region to generate new ideas.
We also receive information with regards to our processing of our palm oil through the ZEE organisation in our local region, they send us messages via leaflets and through local forums to support our business on good sustainable ways of doing palm oil extraction.
Another way I suggest we can promote sustainability is through Palm tree certification and also stop burning of farmlands after harvest of palm trees.

13) Are there any other ways your palm oil extraction business is made sustainable?

Contemporary and indigenous farmers participants gave their views during the interviews on how they think their business can generate more sustainable ways of palm oil extraction in their businesses.

Reply to question 13: Contemporary farmer 11: Giving training to farmers in the region
Training must be regularly given on current or better ways of palm oil extracting based on research and evidence.
Development of information technology the technology we use in our extraction process in my company is good but it can be better with current technology in the market for our extraction process.

If my business can access farming loans from the banks easily this will help to sustain our businesses.

Even though certification of palm oil by different business will cost money, it will definitely make room for improvement as customers want the guarantee that what they are buying is good quality

Every day new palm oil extracting business is opened in the community; farmers need to be inundated with the pros and cons of starting this kind of business prior to commencing

14) How do you think traditional knowledge management of palm oil extraction can improve sustainability in Ologbo Ikpoba-Okha?

Reply to question 14: Contemporary farmer 11: I believe that traditional palm oil extracting process is less expensive compared to machanised palm oil processing methods and as a result will be more sustainable, but the problem is that traditional method cannot be used in processing very large quantities of palm oil at any given one time.

The more palm oil extraction our business can process means an increase in our capital and therefore our business can expand and strive for many more years, and so will our product quality improve more.

15) What can the indigenous farmers do to enhance the traditional palm oil extraction for sustainability

Reply to question 15: Contemporary farmer 11: It will be a good idea to promote good land cultivation for palm oil farming business to promote sustainability also being able to trade on the world stage will help to enhance traditional palm oil extraction business.

16) What do you think can be done to bridge the gap between indigenous and current KM practices to promote sustainability?

Reply to question 16: from contemporary farmer 11: Training and Proper record keeping will help farmers to bridge the gap between indigenous and current KM practices and I believe by so doing will promote sustainability, also There are no proper record keeping in the past by indigenous farmers on traditional processing methods they use and this none record keeping has not advanced their practices.

To bridge the gap, another thing that can be done for the ministry of Agriculture to investment in technology and evidence-based practices that will help to improve best palm oil extracting practices and improve working conditions for employees and businesses in the region.

17) How do you think the process of palm oil extraction can be done in an eco-friendly way?

Reply to question 17: contemporary farmer 11: Farmers should stop indiscriminate cutting down of trees and bush burning, farmers should try to use more traditional palm oil extracting methods such as using less chemicals or insecticides in their farms and have regulations that can be enforced to protect the environment. The Ministry of Agriculture should set-up regulatory

bodies to protect the environment from bad and harmful practices done by some businesses in the region, also harmful and pest control products that can affect the natural habitat.

18) What do you think will be the benefit of an eco-friendly palm oil extracting business?

Reply to question 18: contemporary farmer 11: I believe eco- friendly palm oil processing methods if adopted by palm oil farmers in the area will benefit our businesses and promote sustainability and in so doing our businesses will grow more.

An eco-friendly environment will also be good for the Ologbo Ikpoba-Okha community as our people will breathe cleaner air and this will lead to less sickness and diseases and wildlife in the area will also be protected.

19) What do you think not being eco-friendly in palm oil extracting business can cause?

Reply to question 19: Contemporary farmer 11: not being eco-friendly can lead to deforestation due to cutting down of trees in the local environment and destruction of the natural habitat in the community and this will affect the whole habitat, both humans and wildlife's and livelihoods will all be negatively impacted.

20) What does your business do to promote eco-friendly practices?

Reply to question 20: Contemporary farmer 11: We do have training sessions for our employees about company practices when it comes to palm oil extracting and protecting the environment and these information's are shared regularly with our staff members.

As part of our training to new and old staff, we teach them about the impact not being eco-friendly can have for our environment, so we do our best to practice eco-friendly practices in our business.

As a business, we try to measure our carbon imprints, to see the amount of emission we generate in our company from our machineries by installing carbon detectors. The traditional palm oil extract methods are more eco-friendly but the process traditionally is very tedious and need three times more man-power to carry out the process which is also very time consuming compared to the contemporary methods of using machineries.

Appendix 4: Interview Transcript from Local Indigenous Farmer 16

S/N	PARTICIPANT ID	GENDER	QUALIFICATION	POSITION	PALM OIL FARMING EXPERIENCE	STATE OF ORIGIN	AGE
16	Local Indigenous farmer (16)	Male	WAEC	Palm oil farmer owner	41years	Edo State	50 and below

1) How was Information stored in the past on palm oil extraction process?

Reply to question 1: Indigenous farmer 16: We have IT systems we used in the past but not proper KM systems like we did today. I believe if proper KM system or Knowledge Management is developed it will help our practices when it comes to extraction of palm oil.

2) What are your concerns about the way palm oil extraction was done in the past in your opinion?

Reply to question 2: indigenous farmer 16: We shared information in the past through words of mouth among ourselves, we had no IT systems, if we had IT system it would have helped our knowledge management of our palm oil extracting process more

In the past compared to these days we did not receive any financial support from banks or the government, most financial we received was given by friends and family.

There where palm oil farmers that cared more about profits than the risk poised from our processing practices.

3) What are the local and traditional practices incorporated in your palm oil extracting process in the past?

Reply to question 3: Indigenous farmer 16: Palm seeds are washed in water in drums prior to extraction in the past and we still do same washing of seeds to date. We did not have proper tools to use in doing our palm oil extraction, the local tools we use then and some we still use to date prevents us from extracting our palm oil in large quantities. And the extraction work involved in our business is very difficult.

The practice of washing our palm seeds in the past prevented us from having too much impurities, some big palm oil companies these days have ways to certify palm oil extracted from their farms.

4) What do you think was good about the past(traditional) extracting process?

Reply to question 4: Indigenous farmer 16: In those days, our traditional extraction practices farming practices protected our environment, but these days the machanised **farming practices** do not care much to protect the wildlife and there is no strong government regulation to this, these days bad practices are not monitored for one reason or another which I don't know why. there is not much impurities in traditional palm oil process compared to machined extracting processing we see these days.

5) What don't you like about the past (traditional) extracting palm oil process?

Reply to question 5: Local Indigenous farmer 16: Our traditional palm oil extraction process takes a lot of hard work to do, but with human manpower it gets less difficult. Some of our local tools are very difficult to use.

I started my palm oil extracting business to support my family and most of the skills I acquired was through observing others work.

6) What are the Current Palm Oil Extraction processing your business Use?

Reply to question 6: Local Indigenous farmer 16: In my business we still do extraction using the traditional way, we still boil the palm seeds in a drum and once properly cooked and then we use pestle to pound the seeds which is the separated from the shaft before using a locally made shifter to extract the liquid from the shaft and seed.

7) What Current Training are in place for extraction process in your business?

Reply to question 7: Local indigenous farmer 16: A lot of the skills I learnt for my extraction practices I learnt from observing my father work in those days, in our kind of business we learn from observing others work, there are no supervised practices.

8) Apart from training what other Support Systems are in Place for Your Staff/employees?

Reply to question 8: Local Indigenous farmer 16: My business is a sole business, I do get labour support from my children and do pay them for it, apart from that we do not have any other work incentives, we do take short holiday such as Christmas, easter and sometimes birthdays off. Bing my business I can afford to pay myself extra when I make more profit.

9) What Knowledge Management Software or data do you have that helps to inform your business of best practices when it comes to your business?

Reply to question 9: Local Indigenous farmer 9: My business does not have KM software, we get most of our information on how to develop our business and practice from our local government agricultural department in Ologbo, information gathered from other local palm oil farmers in the area also by words of mouth and also through our local farming union.

10) How has the knowledge Management (KM) your farm used influenced or affected the way your company manage its business?

Reply to question 10: Local indigenous farmer 16: My business does not have KM software neither do we have a company website as I cannot afford the maintenance cost.
We do get information on good practices from the local ministry of Agriculture and these information's are very useful, information's on the kind of fertilisers to use for our palm trees and these information's are helping our current palm oil processing and has brought good development for my business

We also share information's through our local union and, in these meetings, we share information on ways on moving forward in our business.

11) How do you share your knowledge or practices with similar palm oil farmers in your local community?

Reply to question 11: Local indigenous farmer 16: We share our knowledge with other local palm oil farmers in the area through our local unions, also the ministry of Agriculture in our local government shares other farmers good practices to us.

12) How does your business generate new Ideas and sustainable ways of natural resources management of palm oil extraction?

Reply to question 12: Local Indigenous palm oil farmer16: Training of local farmers on good practices by the state ministry of agriculture will help us, also if we can get better tools in our extraction processes that will help to sustain our business.

We also need support and information to get government farming loans to support our business.

13) Are there any other ways your palm oil extraction business is made sustainable?

Reply to question 13: Local Indigenous farmer 13: If training can be given to us by the government and there is improvement in information technology for my business, I believe it will help me business to develop long term and made sustainable.

We need support and information on how to get loans to support our business to develop.

Upcoming farmers need to be introduced into sustainable palm oil farming ways

14) How do you think traditional knowledge management of palm oil extraction can improve sustainability in Ologbo Ikpoba-Okha?

Reply to question 14: Local Indigenous farmer 16: I believe the traditional processing method can improve sustainability because it is less expensive compared to machanised processing methods.

Our traditional extraction process palm oil is of a better high quality.

15) What can the indigenous farmers do to enhance the traditional palm oil extraction for sustainability?

Reply to question 15: Local Indigenous farmer 16: If we can process of palm oil in large scale using the traditional method, this I believe will lead to sustainability in our business.

Also, if we can do business all around Nigeria and in a global scale it will lead to sustainability in our business.

16) What do you think can be done to bridge the gap between indigenous and current KM practices to promote sustainability?

Reply to question 16: Local Indigenous farmer 16: I believe if records are kept on traditional practices on palm oil processes which has allowed indigenous farmers decades to carry out their palm oil processing methods without affecting their environment this knowledge can help to promote sustainability for our businesses. Am sure if I should speak for my co-farmers to develop our business, we need financial support to do so and this financial incentive is lacking for a lot of us including me.

The work of palm oil extraction is very hard and so I cannot afford to pay the amount requested by people I wanted to employ to join me in my farm.

17) How do you think the process of palm oil extraction can be done in an eco-friendly way?

Reply to question 17: Local Indigenous farmer 16: Farmers should stop cutting down of trees during and after harvesting as this practice if not checked will lead to deforestation and the log term effect of this is dangerous to our local environment.

There is also the danger bush burning after clearing of our farms can cause such as wildfire, this practice even though practice for decades should be stopped.

Our traditional extraction method uses locally made tools and does not involve industrial machineries that blow fumes into the atmosphere and so I encourage traditional palm oil extraction methods.

Also, the amount and different types of insecticides and chemicals used by different farmers in their farms to protect their crops or cause an increase in the size of their palm fruits can cause damages to the eco-system in our local government.

18) What do you think will be the benefit of an eco-friendly palm oil extracting business?

Reply to question 18: Local indigenous farmer 16: If the environment is conducive for palm oil farming and extraction then my business will grow and I will make more money from my work, as people will move more to the area to do business, an eco-friendly environment will be

good for our local community, people will breathe cleaner air and that will lead to less sickness and diseases.

19) What do you think not being eco-friendly in palm oil extracting business can cause?

Reply to question 19: Local indigenous farmer 16: if we are not eco-friendly in our palm oil extracting practices it can lead to deforestation, destruction of our forest and can lead to destruction of animals in our forest.

We have to protect our environment and not being eco-friendly will damage our environment in the long term.

20) What does your business do to promote eco-friendly practices?

Reply to question 20: Local indigenous farmer 20: The practices I use for palm oil extraction in my business I believe is eco-friendly as I use the traditional palm oil extracting process**.** Our practices are eco-friendly; these practices have been passed down for generations

I have heard about monitoring of carbon footprint, but I do not know anything about it or how to monitor carbon footprint so my business does not do it. If I can afford it, I will do it.

I use traditional practices in my palm oil business and I believe it is eco-friendly

Appendix 5: Letter of Consent from Ologbo Local government

IKPOBA-OKHA LOCAL GOVERNMENT

P.M.B 1094,
IDOGBO,
EDO STATE OF NIGERIA.

BF117/T/103

Our Ref:_____

Your Ref:_____

15th April, 21

_____ 20_____

MS MARY MENA DORE-OKUOIMOSE UNIVERSITY OF WALES TRINITY SAINT DAVID LONDON UK

Rep: Permission to conduct research work in Ologbo Community of Ikpoba-Okha Local Government, Idogbo, Edo State.

The above student has consulted the Local Government Council and she is seeking for a permission to carry out her field doctorate research work on the historical indigenous practice of knowledge management at Natural Resources (**Palm oil extraction)** of the people of Ologbo in Ikpoba-Okha Local Government Area.

In view of the above, Ikpoba-Okha Local Government authority have granted Ms Mary Dore-Okuoimose, permission to carry out her research work only, therefore any other motive should be disregard.

We wish you good luck and peaceful research work.

Osayande Osagie.
HOD Budget, planning Research and Statistics
For: Acting Chairman/Head of Local Government Administration
Ikpoba-Okha Local Govt.
Idogbo, Edo State, Nigeria.

Appendix 6: Palm Tree with fruit brunch attach

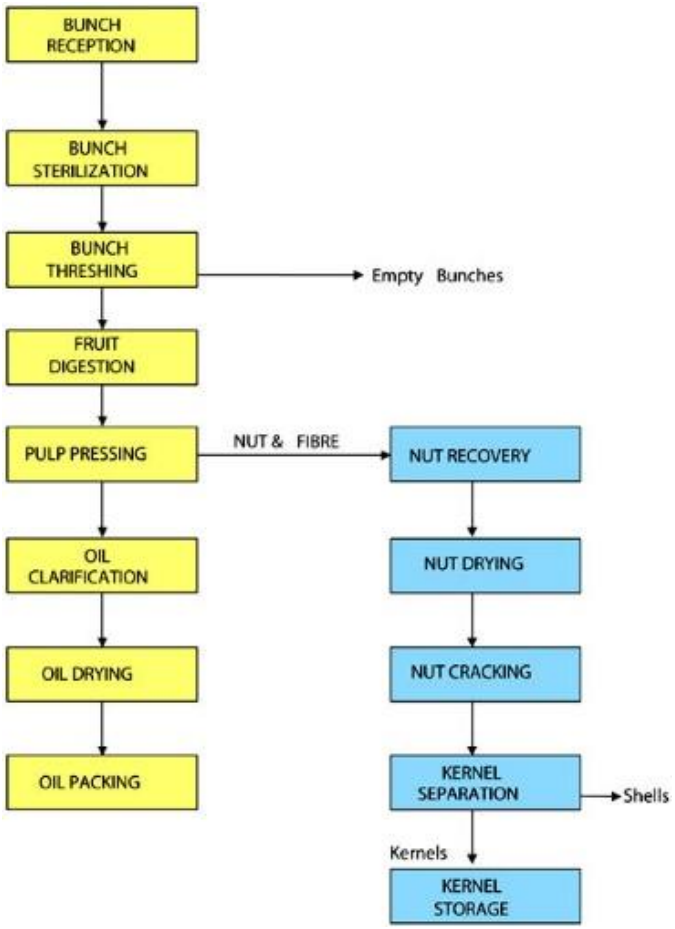
(Image: Oil Palm Plantation in Nigeria

Appendix 7: Palm Oil Fruit Brunch

Image: of Palm Oil Fruit Brunch

Appendix 8: Traditional Extraction Method Using mortar and Pestle

Appendix 9: Systematic Palm Oil Extraction Process Method



Appendix 10: Machanised Palm Oil Extracting Machine with Cyclone