

INDIGENOUS FOOD SYSTEMS: A VIABLE ALTERNATIVE TO FOOD
SECURITY.

A CASE STUDY OF THE IRIGWE INDIGENOUS PEOPLE OF KWALL, IN BASSA
LOCAL GOVERNMENT AREA OF PLATEAU STATE, NIGERIA.

by

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PREFACE

This thesis is original, independent, unpublished work by Majing Oloko.

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LIST OF ABBREVIATIONS

I.F- Indigenous Foods

FME- Federal Ministry of Environment

F.S-Food Security

FMARD-Federal Ministry of Agriculture and Rural Development

ASTC's- Agricultural Services and Training Centres

PSMARD-Plateau State Ministry of Agriculture and Rural Development

LGA- Local Government Area

OPHI- Oxford Poverty and Human Development Initiative

NAIP-National Agricultural Investment Plan

ABSTRACT

Despite the central role that Indigenous foods can potentially play in meeting people's food security needs in Nigeria, it has continually been ignored by Government and policy makers. With 65% of Nigerian's considered food insecure, and a rapidly growing population, there are calls for a more sustainable food security policy. In order to highlight local prospects and encourage the recognition of Indigenous food and knowledge, this qualitative case study focused on the Irigwe Indigenous food system, from Kwall community, in Bassa Local Government Area (LGA), Plateau State, Nigeria. Interviews and talking circle were conducted for 30 participants to collect data on the Irigwe Indigenous food system: their food and its nutritional and medicinal value, the challenges that the people encounter in their bid to access their food and their insights on how their community's food security can be improved. Participants were able to identify 23 Indigenous foods (grains, tree plants, vegetables and fish) they utilize for nutritional and medicinal purposes. *Ibre* (*Eleusine coracana*) and *riti* (*Vernonia amygdalina*) are examples of some foods with nutritional, medicinal and cultural significance. 18 participants said they use their food for both nutritional and medicinal value. Subsistence farming is the dominant means by which participants access their food. 10 participants access their food exclusively through farming. Other means of accessing food include wild food harvesting, sharing, exchange and purchase. Among all the challenges participants face in accessing their food, human insecurity is the dominant challenge facing participants. Other challenges include environmental challenges, threats to Indigenous species and developmental challenges. Participants suggested that dry season farming should be made more accessible, and traditional farming techniques should be more innovative in order to attain sustainable food security in households and the community at large. They would also want to participate in policy discussions and programme implementation.

Key Terms: Indigenous Food, Food Security, Indigenous Food System, Irigwe People, Rural Communities.

CHAPTER ONE

INTRODUCTION

1.1 Background

While the Millennium Development Goal (MDG 1) of halving the number of hungry people in the world by 2015 has been achieved, the launch of the Sustainable Development Goals (SDG) indicates that there is still more work to be done in the area of food security. Recent estimates show that one in nine people (795 million) in the world still remain undernourished and most of these people live in developing countries, where 12.9 percent of the population are undernourished (UN, 2016). Although some parts of Africa have made progress in reducing hunger, Sub-Saharan Africa (SSA) has recorded insufficient progress towards international hunger targets, where more than one in four people remains undernourished- the highest prevalence of any region in the world (FAO, 2015). A 2014-2016 projection indicates a rate of undernourishment at about 23 percent in Sub-Saharan Africa (UN, 2016). With a population which is said to reach 2.4 billion in 2050, there is concern on how to make Africa food secure (FAO, 2015, IFAD, 2012). Nigeria, which is currently the most populous country in that region, has a central role to play in the effort to attain food security in the region; however, it faces its own food security challenges as well.

Nigeria, which presently sits at 173 million in terms of population (World Bank, 2014), is expected to more than double that size and surpass the US to become the third most populous country in the world by mid- century (UN, 2015). Although population is not an ultimate destiny; which means that projected population growth rates may not be exact due to some progress in contraception use and progress in people's livelihood and education, it gives governments and policy makers an idea of what exactly they are going to be dealing with

(UN, 2015). If it is not able to feed its current population, it is worrisome how it will do that when there are more people competing for limited resources.

Despite spending over 40 percent of their household income on food, 65 percent of Nigerians are considered food insecure (FMARD; NAIP, 2013), the concern is not just how to provide food for its growing population, but how to provide it sustainably (Idiku, et al 2012). Prior to Nigeria's independence in 1960, the colonial government promoted the production of cash crops such as cocoa and rubber, the focus then was on export and not necessarily on food security (Korieh, 2007). Since then, attempt made to re-focus the country's agricultural policy has produced little significance to its food security status. Almost all post-independence food security or agricultural policies had similar structures; it was basically names that change and because policies in general are often synonymous to administration tenures, programmes get easily tossed out with change in government, therefore, there is little room for continuity and accountability (Opata, 2014).

More than half of Nigeria's population live in rural communities like Kwall, and it is among those rural populous that poverty and food insecurity is especially high (World Bank, 2015). Over 90 percent of food produced in the country come from small holder farmers in rural areas, ironically, more than 80 percent of them live below the poverty line and their communities suffer infrastructural underdevelopment, poor health and social amenities, malnutrition, poor sanitation and diseases (IFAD, 2012) . This is because they rely on income generated from their various food systems through farming and wild harvesting to meet their needs and it is from the same source that they feed their households ad communities. Due to challenges they face in their various communities, they are often unable to produce enough to serve both purposes, hence, food meant for household consumption is often sold to generate income to meet other needs (World Bank, 2015)

One of the challenges that have been identified as plaguing the country's food security policies is their lack of engagement with Indigenous farmers in rural communities (Iwuchukwu & Igbokwe 2012), the very people for whom the programmes are claimed to be for. This means that programmes are conceived, planned and executed with little or no grass root input (Opata, 2014).

This means disregard for Indigenous knowledge, existing community food system and local capacity. The current top-down approach that reaches for external remedies at the expense of existing food systems has proven to be unsustainable. Empowering Indigenous farmers, who currently account for the production of most of the food in the country, could potentially help in enhancing the nation's food security status.

Food importation is not always an indication that a country is food insecure, because nations trade in food for different reasons. It could be for foreign policy or trade agreements, in which case they agree to trade in certain commodities to honour or patronize each other, or simply because they produce too much of such food and they feel they are able to sell it and earn some revenue for themselves. However, in the Nigerian situation, it has ignored potentials in form of its Indigenous food systems, and relies heavily on the oil sector. The lack of diversification in its food sufficiency, places it in a vulnerable situation, where events such as drop in oil prices, global or national security situations, or natural disasters could potentially exacerbates the current food insecurity in the country, for access to food, and stability, is essential for food security to be attained (FAO, 2015). For now, it depends on oil revenues to execute such imports and it is remarkable how volatile such life lines can be, as evident in the recent global oil price fall.

The resultant effect of poor or no food security policies goes beyond just the absence of food, its effects can be far-reaching at the regional, national, state and community level (Morrison

& Pearce, 2000), the effects at the community level is evident in Plateau state-north-central Nigeria, where Kwall community is situated.

In the absence of figures to show the state of food security on the local level, figures from the National Demographic and Health Survey (NDHS), which gives details on specific indices such as infant, child and maternal health and nutrition on a regional level within the country and on the state level is utilized by studies (Okeke, 2009). Plateau, is one of the states in north-central Nigeria, and according to the most recent national Demographic and Health Survey (NDHS), 29 percent of children in north-central Nigeria are stunted (stunting is a primary manifestation of malnutrition), Northern states perpetually perform poorer in most anthropometric indices than their southern counterparts, and it is especially severe in rural areas (NDHS, 2013).

Besides federal food security policies that are implemented on a national level, state governments often come up with their own local food security policies. One of such policies is the Agricultural Services and Training Centres (ASTC's), which is the most recent food security policy in Plateau state. It was initiated by the past administration that just got changed in 2015. The ASTC's are supposed to be the structures for empowering small scale farmers across the state. Not many studies have been done to review the impact of the programme yet, but it will be interesting to see what a change in government will mean for the life-span of the programme. However, seven years into the programme, some citizens do not even know that such a programme exist, let alone access it. That is the case for some Kwall community members (Goji, 2015).

The consequences of failed agricultural policies, haphazard policy implementation and a broken agricultural sector, brought Nigeria to its current food security situation (World Bank, 2015; IFAD, 2012). Subsequently, Nigeria resorted to food importation to feed its growing population (Krawinkel, 2012; Anselm & Taofeeq, 2007).

A significant number of scholars argue that Nigeria's food security challenges can be tackled by utilizing Indigenous foods (Okeke, et al, 2009; Effiong, et al 2010; Adeolu & Amusan, 2014). Indigenous African species make up 115 of the edible food plants commonly used at present; Africa is also home to significant number of endemic species (species unique to a defined geographical location and not found anywhere else) and major regions of crop diversity, including the Delta of Nigeria's Niger river (Kiambi, & Atta-Krah, 2003). There are over 4,600 plant species identified in Nigeria, 205 of which are endemic (Sarumi, et al, 1995; FAO, 1996). The rationale is that Indigenous farmers who are responsible for producing most of the food within the country, possess the knowledge needed for the production and harvesting of these foods (Nnamani, et al 2007), Although they do so under challenging circumstances such as uneven rain fall, and difficult security situations, they have been doing so for many generations and there is room for improvement. Besides, most Indigenous food require little input, and adapt favourable in tough conditions (Onyango, et al 2009). Some of these foods can be sourced from the wild like the kuka (*adansonia digitata*) which is a good source of fat, iron, and other micro nutrients; hence there is minimal impact on the environment (Adedayo, et al 2010).

Since food security is not only concerned with the availability of food, but also the nutritional component, safety and accessibility to food (FAO, 2015), there is concern as to whether wild species alone can be relied upon to meet the nutritional need of people in Nigeria (Nwajiuba, 2012). Studies about Nigerian Indigenous species suggest that they possess nutritional and medicinal benefits in form of essential nutrients and minerals such as protein, fat, Iron and Zinc needed for proper body functioning (Onianwa, et al 2001; Lockette, et al 2000; Oyetayo, 2011; Nwosu, 2002) , and contribute to household food supply and income (Chukwuone & Okeke, 2009; Ayanwale & Amusan, 2014; Agboola, 2004; Harris Frances & Mohammed, 2003); but accessing and/or producing these foods come with

challenges (Kuwali, 2008; Ehinmore, et al 2013; Enete & Amusa, 2010; Okechukwu, et al 2014; Idiku, et al 2012) in form of climate change effects, and coping with traditional farming practises in the face of changing population and environmental dynamics.

Because of its growing population and the strategic position it holds, especially in Sub-Saharan Africa, Nigeria's state of food security could have implications for Africa's food security (FAO, 2015). Despite many years of investment in food security programmes, Nigeria has not been able to sustainably feed its people. Failed agricultural policies have been blamed for the current situation. While the government invested its attention on oil exploration and how to satisfy the newly developed cravings of oil rich expatriates and Nigerians through importation of exotic foods and processed goods, the agricultural sector was underdeveloped and largely ignored. Indigenous farmers practically sustained the sector, through traditional farming methods and wild food harvesting. These failed policy regimes are largely characterized by centralized governance in term of policy formulation and implementation, and a huge appetite for foreign remedies that gives room for corruption (Akinyoade, et al 2013). The community food security (CFS) framework that is study is proposing is embedded within the larger food security framework; it decentralizes decision making and works towards the well-being of all members of a community while taking into consideration its food system (Hamm & Bellows, 2003). In essence; potentials such as the various Indigenous food systems in the country and Indigenous knowledge that many rural farmers have been using for many generations to feed the nation, were disregarded. This study seeks to highlight such potentials. Further studies on Indigenous foods, especially underutilized species will highlight information that could be used for food security policies and research purposes. An IDRC sponsored research on underutilized Indigenous vegetables in southern Nigeria for example resulted in more acceptances for such plants, increased

farmers' financial return and enhanced rural food security in those communities (IDRC, 2014).

1.2 Statement of Research Problem

Studies have shown that Indigenous foods play a vital role in meeting the food security needs of people across Nigeria, yet it is continually been ignored by policy makers (Cordeiro, 2013; Agboola, 2004). Nigeria is the world's largest producer of Yam, Cowpea and Cassava, yet it depends on imported foods to feed its people (IFAD, 2012). Agriculture, which is the largest employing sector in the country employs two-third of the country's labour force and contributes 40 percent to Nigeria's GDP, however, most of this farming is done on a subsistence level by rural farmers who cultivate small plots of land and depends heavily on rainfall (IFPRI, 2012). According to the World Bank, Nigeria's agricultural policies constitute significant constraint to growth in the sector (World Bank, 2015). The history of Nigeria's agricultural policies is intertwined with its political history; with the colonial government, the focus was not necessarily on attaining national food security, but on the production and promotion of cash crop for exportation (Opata, 2014). Food security was incorporated as one of Nigeria's agricultural objective in later years (Plateau State Ministry of Agriculture and Rural Development, 2015; Amadiume, 1987).

Along these lines, agricultural policies in Plateau state have passed through stages with different administration, from the first major post- colonial agricultural investments made between the mid 1970's to mid 1980's which lead to the establishment of projects such as the Bokokos Farm Project, Kuru Livestock Farm Complex, Butura Dairy Farm, the Panyam fish farm, the Jos Abattoir, and the Plateau Agricultural Development Program (PADP) which are now a shadow of themselves, to the establishment of the Agricultural Services Training Centres (ASTC's) in 2008 to 2015 (Plateau State Ministry of Agriculture and Rural

Development, 2015). The ATCS's were established to administer the state government's agricultural policy which focused on enhancing production, mechanizing farming, training local farmers and research (Plateau State Government, 2015). Again, the recent change in the state administration comes with uncertainty. Rural farmers wonder if there will be continuity because some communities are yet to receive the dividend of the policy on ground and there is an administration change already (Kwaja, 2013). Often, agricultural policies in Nigeria lack grass root input, hence there is a generalization of programmes, with a top-down approach usually enacted and controlled centrally with little consideration for community strengths and prospects (IFPRI, 2012; Enete & Amusa, 2010). This has led to programme mismatch and funds being directed to areas that make little impact to rural farmers who need them the most (IFAD, 2013; World Bank, 2015). Rural communities like Kwall (the research site) feel disengaged with the system because like previous programmes, input from rural farmers and Indigenous knowledge is been ignored (Baba Goji, Irigwe elder, 2015).

Inter-communal and farmer/pastoralist conflicts continue to impact on food security in the state. This has resulted into far-reaching effects on the well-being of the populace. In Plateau state, 36 percent of its children are stunted, 20 percent of them are considered underweight, while about 10.5 percent are said to be wasted (NDHS, 2013). These indices tell a lot about the nutritional status of mothers and by extension, the food security situation of the population (NDHS, 2013; FAO, 2015). Studies have shown that in difficult times, such as war and drought, Indigenous food systems have supported the nutritional needs of people, and require little input to thrive (Harris & Mohammed, 2003). Example of such Indigenous food is Millet (*Eleusine coracana*), which is comparable to rice in terms of its protein and fat content, and superior to wheat and rice in terms of its mineral and micro-nutrient content (Gull, et al 2014). Even in the midst of developmental, security, climate change and traditional production challenges, farmers in various Indigenous communities across Nigeria

have managed to produce most of the food domestically consumed in within the country and in neighbouring countries such as Niger and Chad, who rely on northern Nigeria's Indigenous grain and cereal crops for their food security (PROSAB, 2008). However, food security is far from reach as evidence in the number of Nigerians who are considered food insecure; especially in rural communities where 80 percent of people live below the poverty line (IFAD, 2012)

This research highlights the traditional food system of an Indigenous community that has been in place for many generations. Although the community faces challenges in their bid to access these foods, this study sheds light on an existing capacity that can be built upon on a community level and potentially provide lessons that could be transferred towards attaining food security on a state, national or regional level. The research community is located in the north- central part of Nigeria. Northern Nigeria is said to be food insecure and underdeveloped compared to the rest of the country (World Bank, 2015). Insurgency in some parts of Northern Nigeria has made the region especially vulnerable to food insecurity.

A research on Indigenous food system of some Yoruba communities in south-western Nigeria resulted into greater food security and income for local farmers in the community (IDRC, 2013). Similarly, studies that highlighted the value of Nigeria's cassava for example resulted in governments policy of 10 percent mandatory inclusion of cassava flour in wheat flour in 2012, this move by the government has resulted into an annual saving of about N127 billion in wheat importation (Ewepu, 2014, Michael, 2015). Serving Indigenous foods to school children has helped enhance food security and reduced poverty in various African countries (State of the World 2011: Innovations that Nourish the Planet, 2011). This study could provide useful insights for policy formation and implementation.

1.3 Purpose and Objectives of the Study

The purpose of this study was to explore the Indigenous food systems of the Irigwe people of Kwall, and its potential for enhancing community food security.

Indigenous food will be defined as foods from the natural environment which became included into the cultural food use patterns of a group of Indigenous people (FAO, 2015).

The specific objectives of the study were:

1. To identify the various Indigenous foods utilized in the community and their nutritional and medicinal values, from an Indigenous perspective
2. To explore the challenges associated with accessing Indigenous foods by Kwall community
3. To generate suggestions for recommendations to strengthen food security from the Irigwe perspective.

1.4 Significance and Scope of the Study

A study of Indigenous foods and how it contributes to food security is important for the following reasons. First, it will contribute to existing literatures related to the topic in terms of bringing into focus the various Indigenous foods from the study area and their benefits, which is lacking in current literatures (Nnamani, et al 2009; Agboola, 2004). Developmental gap between the northern and southern parts of the country is reflected in the disparity in terms of the level of education between the two regions; with the north been less educated than the south (World Bank, 2015). This has manifested in terms of available literatures from the two regions as well, this study would potentially contribute in filling that gap. Secondly, Indigenous food systems play significant roles in maintaining the well-being and health of Indigenous people, however, evidence show that the traditional food base knowledge of

Indigenous peoples are being eroded (Okeke, et al 2009; Dweba, et al. 2004), therefore a study on Indigenous food will help document and preserve that knowledge. Thirdly, a study which privileges Indigenous perspectives on knowledge, challenges and solution could potentially constitute a valuable asset for local policies like the Plateau State ASTC, which covers Kwall (the research site). Government other private investors will have one less challenge to deal with if they have a clear picture of the peoples experiences and what they what to see as solution. They can then redesign their policies to reflect grass root input.

Such representation has implications on Indigenous governance. In order to exercise their self-determination and have a say on how resources in their community is used, they must have a clear picture of potentials, challenges and opportunities of their Indigenous food system. This study could potentially give the community valuable information they need to make informed decisions and negotiations for the greater good of their community- which thrives on its food.

In terms of the category of Indigenous food, this study focused only on plant based food, and fish. This is because plant based food is mostly consumed by the Irigwe people; traditionally, meat has been of little significance to their diet (Sangree, 1974). Studies show that most Nigerians get over 80 percent of their protein from plants (Onimawo, 2010), meat is derived from livestock, game and poultry; however fish has remained a more accessible alternative to many. It is also preferred by the Irigwe's because it is inexpensive, nutritious, medicinal, and can be sourced from community rivers without using sophisticated gadgets. Figure 1.0 shows houses in Kwall community.

While this study seeks to explore the nutritional and medicinal value of Indigenous foods in order to determine its relevance to food security, it will not embark on any laboratory testing of food items. The knowledge that this research seeks to highlight is Indigenous knowledge.

It aims to privilege Indigenous experiences, stories, suggestions and preferences.

Nevertheless, studies with scientific scope were used for the literature review; this was done for two reasons: a. shortage of literatures from the region that privilege Indigenous knowledge and b. by bringing such literatures, there could be room for potential cross-cultural learning between the Indigenous world view and the mainstream perspective.

1.5 Operational Definition of Key Terms and Notes on Terminologies

Food Security: Food security exists when all people, at all times, have physical, social and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 2015).

Community Food Security: Community food security exists when all community residents obtain a safe, personally acceptable, nutritious diet through a sustainable food system that maximizes healthy choices, community self-reliance and equal access for everyone (Hamm & Bellows 2003: 37).

Indigenous People: Indigenous people refer to a group of people who self identify themselves as “Indigenous”, who are often pastoralists; hunter-gatherer’s and/or small scale farmers. Their cultural, social and religious way of life differ considerably from the dominant society and in most cases depend on their traditional lands and natural resources for survival (African Commission on Human and People’s Rights- ACHPR, 2006).

Indigenous food system: “Traditional food system” is used to identify all food within a particular culture, available from local natural resources and is culturally accepted. It also includes the sociocultural meanings, acquisition, processing technique, use, composition and nutritional consequences for the people using the food (Kuhnlein, 2006:19).

Indigenous Food: These are foods from the natural environment which became included into the cultural food use patterns of a group of Indigenous people (FAO, 2015).

Irigwe People: These are the Indigenous people from Miango and Kwall districts in Bassa Local Government Area of Plateau State, north-central Nigeria (Plateau State Government, 2015).

Food security policy and agricultural policy have been used alternatively in policy documents and literatures in the Nigerian context. This will reflect in this study.

Indigenous communities and rural communities will be used interchangeably based on how it is presented in literatures. Studies from Nigeria often refer to Indigenous communities as rural.

1.6 Organisation of the Study

Chapter one introduces the study by giving a background to the central issue, statement of problems, purpose and objectives of the study and the significance of the study. It also defines the scope of the study, operational definition of key terms and notes on terminologies.

Chapter two presents the literature review. It begins by discussing the conceptual framework of the study and examines the rationale behind the choice of concepts and how they relate to the central issue. It then goes to give a comprehensive review of the literatures selected for the study. Literatures are discussed under themes that correspond with the objectives of the research. A summary is given at the end of this section.

Chapter three explains the research design, method and approach the study is taking.

Worldviews are expressed under this section, and the strategy of inquiry that the study adopted was also explained. The characteristics of the participants and the rationale behind selecting the participants and the study community were also provided under this section.

Chapter four gives a background of the community. A dense description about the historical and present day realities is provided. The characteristics of the regions climate, vegetation and population were discussed as well.

Chapter five discusses results from the study under the objectives laid out. It also provides a discussion on the relationship between food and medicine in the Indigenous culture. A summary of the contents under the section is also given.

Chapter six contains the conclusion and recommendations. A summary of all chapters is given, with critical thoughts on implication of findings on the Irigwe Indigenous food system and food security, and thoughts study's implication on Nigeria's food security.

Recommendations on how to improve food security through harnessing the potentials of Indigenous food systems are proffered.



Figure 1.0- Houses in Kwall community

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview of Literature Review

Indigenous food systems have been an integral part of the food security of many Indigenous communities across Africa (Demi, 2014). In Nigeria, Indigenous peoples from the lush rain forest communities in the south, to the open grassland in the middle belt, and the semi-arid communities in the far north have relied on their food for nutrition, medicine and livelihood (FME, 2006). Despite the contributions that Indigenous food systems make in meeting these needs, it has continually been ignored by policy makers and has not received needed representation in literatures (Dweba & Mearns, 2011)- especially Indigenous food system of minority Indigenous groups such as the Irigwe's in north-central Nigeria. The approach which Nigeria's food security has taken for many years has been characterized by centralized policy formation and foreign remedies, where decision making is done at the top with little or no input from the people for whom the project is meant for (Philip, et al 2009). This kind of approach has resulted in neglect of Indigenous food systems and their potentials, and disregard for Indigenous knowledge. This study proposes a community food security approach within the broader food security framework, which takes into consideration a community's food system- in this case its Indigenous food system and its challenges, and opportunities for the greater food of all members of the community. While leaders shifted their attention on oil exploration, the country's agricultural sector suffered (Iwuchukwu & Igbokwe, 2012). Although the country has invested in numerous food security programmes in the past, they are widely perceived as being unsuccessful (Opata, 2014). Most recently private/community/public partnerships have resulted into studies and projects towards

improving food security. This section looks at some of these initiatives, their recognition of Indigenous food systems and knowledge if any, and their implication for food security.

It is argued that the problems of hunger and poverty cannot always be solved through dependence on exotic species and genetic modified species that favour market players; but revitalizing interest in Indigenous foods will not only provide healthy food, but potentially improve the local economy where the foods comes from, preserve Indigenous knowledge and agricultural biodiversity (Adesulu & Awojobi, 2013; Nnamani, et al 2009; Odiaka & Schippers, 2004). The section will start by discussing the conceptual framework that the study is adopting. An analysis of the food security and community food security frameworks will be analyzed, and how Indigenous food systems fit into their core principles. Nigeria's Indigenous species- both plant and animal based have been studied from different perspectives and for different reasons, however this literature review will consider peer reviewed sources that examined Nigeria's and Africa's Indigenous food systems from various Indigenous communities across Nigeria and Africa, and their contribution to nutritional and medicinal needs of community members. Challenges associated with accessing these foods will also be examined. Gaps will be identified at the end of each section and a summary of the chapter will proceed. These themes emerged from literatures and they were selected because of the context they bring to the study, the availability of literatures under those topics and their relevance to this research.

2.2 Conceptual Framework

2.2.1 The Concept of Food Security

The concept of food security really came to the forefront in the 1970's, and it was at the 1974 World Food Conference in Rome, that the first explicit acknowledgement was made; that

food security is an international issue, and that it concerns all mankind (FAO, 2008, Napoli, 2011).

Since then, the definition of food security has evolved and diversified to accommodate the different approaches and context to the problem (Maxwell, 1996 in Napoli, 2011) Food security is a flexible concept as reflected in the many attempts to define it; it is therefore necessary to attempt to establish an implicit or explicit definition of the concept whenever it is used in a research (Clay, 2002).

The 1970's, was a period when the world was facing major food crisis, and the problem was seen as that of supply, so, emphasis was more on price regulation and ensuring continues availability of basic food stuff both nationally and on the international front. This was to be done through increase in food production and ensuring proper distribution of food from areas of surplus to those of demand (Lee, 2007). This lead to the 1974 definition of food security:

“Availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food and to offset fluctuation in production and price” (UN, 1975. Report of the World Food Conference, Rome 5-16 November, 1974. New York).

The concept of food security began to incorporate the economic and physical aspects of access to food when it was realised that the issue of food security goes beyond just increase in food availability, but that people should not have challenges accessing food because of issues with development and poverty (Napoli, 2011). The World Food Summit in 1996 took into consideration those matters arising in its definition of food security.

Although access is an important aspect of food security, it can only prevent hunger if accompanied by stability (Napoli, 2011)).

Food security definitions also acknowledge the “social” access to food, as issues surrounding vulnerable people of the world such as women and Indigenous peoples and their ability to access food.

Based on the following aspects, food security can be said to comprise of four dimensions:

- The physical AVAILABILITY of food- which is concerned with the “supply side” of food, mainly through food production, stock level and net trade (FAO, 2008)
- Economic, physical and social ACCESS to food- this recognises the fact that food security on the national and international level does not necessarily reflect household food security; hence there is a need to ensure that policies focus on income balance, and food price regulation. (FAO, 2008, WFS, 2001)
- Food UTILIZATION- this has to do with how the body utilizes the food consumed, issues with safe food handling, preparation and storage, and diversity in food consumption. Issues with how food is distributed among members of households is also important here (FAO, 2008)
- STABILITY of the other three dimensions (mentioned above) over time- It is just not enough to have access to safe and nutritious food to a certain extent, regular access, and maintaining that access, is the goal. So, losing the ability to have regular access to food due to challenges such as unemployment, security challenges, or even adverse weather conditions that hampers one’s ability to access food, can make that individual to be considered food insecure (USDA, 2008; FAO, 2008)

According to the FAO, for food security objectives to be realized, all four dimensions must be fulfilled simultaneously (FAO, 2008).

In essence, food security has evolved from just all time availability of food, to putting emphasis on access, to nutritious and safe food. Preference to food is also key to achieving

food security; therefore, a community's food system has a vital role to play in providing continuous access to safe, nutritious and culturally preferred food.

The nutritional aspect of the food has been highlighted by organisations such as the WHO in their discussion on food security because of the health related challenges that come with poor nutrition, which they recognise as a dominant problem in developing countries (WHO, 2016)

According to the WHO, food security is a complex sustainable development issue, linked to health through malnutrition, but also to sustainable economic development, environment, and trade (WHO, 2016).

The definition of food security adopted by this study is the most recent definition of the concept by the FAO, which takes into consideration the diverse and unique situation of people around the world. To the FAO of the UN:

“Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (FAO, 2015).

The core components of this definition, as underlined above, informed the decision to adopt the concept in this study. The rationale will be further discussed in the next section.

2.2.2 The Rationale for the Choice of the Food Security Concept

The scope of food security has since evolved from the first time it originated. It has moved from just having enough food for all, to incorporating other issues such as nutrition, access-economic, physical and social or cultural, and issues of preferences in food choices.

Because of the high degree of context that the concept has adopted over the years, it has been described as “an intermediating set of actions, to live a healthy and active life, and not

necessarily a goal on its own” (Clay, 2007). For this reason, various groups can adopt the concept and personalize it to fit their current realities. These include vulnerable groups such as small holder farmers in developing countries, women and Indigenous people.

The concept of food security has been criticized for its failure to address the social control of food systems (Patel, 2012), and the promotion of food as a trading commodity (Napoli, 2011), which has made food prices to be controlled and dictated by global trade forces.

This has led to the emergence of movements such as the *La Via Campesina*, an international peasant movement formed in 1993. The main goal of the movement is to realize “food sovereignty” and stop neoliberal system of controlling global food systems. It believes that small scale farmers, including peasant fisher-folks and pastoralist, are capable of producing food sustainably, for the benefit of their communities in a healthy way (*La Via Campesina*, 2016). According to the movement:

“Food sovereignty is a right of people to healthy and culturally appropriate food produced through sustainable methods and their right to define their own food and agricultural system” (*La Via Campesina*, 2016).

So, essentially, food sovereignty tries to shift control of food to the producers and away from market forces. As at now, interest groups and vulnerable people such as women, small scale farmers, the urban poor and even consumer and environmental groups are put into consideration in the movement.

Windfuhr and Josen (2005) said that “while food security is more of technical concept, and the right to food a legal one, food sovereignty is essentially a political concept” (Windfuhr & Josen, 2005:15). While some quarters highlight the differences between the two concepts, it is important to note their similarities.

As it is, there are some similarities in both concepts, in the sense that food security and food sovereignty have been described at some point by different parties as been “a means to a goal”, as oppose to a goal on its own because of the flexibilities that both concepts offer (Clay, 2007; Lee, 2007), however, *La Via Campesina* chooses to maintain that “food security” is a goal, and “food sovereignty” is a means to get to that goal.

Similarly, both concepts seem to agree on their target population- the hungry, the vulnerable, which includes people who by their predisposition are not economically, physically, or socially able to access food.

However, food security has been described as a complex sustainable development issue, which is not only linked to health and malnutrition, but to economic development, trade and the environment (WHO, 2016). Food security has been positioned synonymously to poverty in the developing world context, it is seen as one of the underlining and interrelated issues with the current realities of developing countries, especially those in sub-Saharan Africa context (FMARD, 2013; USDA, 2008).

For Nigeria, which is the most populous country in a sub-region where very little progress has been made towards meeting hunger targets, and where the highest prevalence of under nutrition exist, food security really becomes one of several issues that ill the region. The food security challenges in Nigeria and sub-Saharan Africa has been linked to poverty, and poverty to the absence of sustainable development, which includes economic development, human capital development, social security, national/regional security, and environmental/renewable resource management and conservation (NDHS, 2015; World Bank, 2015, WHO, 2016).

World population is expected to grow by 2.3 billion people between 2009 and 2050, nearly all of this growth is expected to happen in developing countries and sub-Saharan Africa’s

population is expected to grow the fastest (UN, 2015). By 2050, Nigeria's population is said to reach 440 million, surpassing the US and starting to rival China to become the second most populous country in the world by the end of the century (UN, 2013).

Clearly there will be an increase in food demand and the region needs to more than double its current crop production to meet that demand, and although there are prospects of improvements in the number of undernourished people in developing countries by mid-century, most of that improvement is forecast in Asia, leaving sub-Saharan Africa with the hunger burden upon itself (FAO, 2013).

This background information underlines the importance of putting in place effective poverty reduction strategies, safety nets and rural development programmes (FAO, 2013).

Because agriculture remains the largest employment sector in most developing countries like Nigeria (IFAD, 2014), people depend on their Indigenous food system for their livelihood. This means that agriculture should not only be able to provide them with food, but with other necessities of life; like clothing, shelter, economic power to access services such as health, education, and seek to enhance that means of livelihood for the good of their community and others in the wider community that we all share as human beings- earth.

So, for the 70 percent of Nigerians who live on US \$ 1.25 a day, and for the more than 80 percent of rural dwellers who live below the poverty line (IFAD, 2014), this is their reality.

Of an estimated 71 million hectares of arable land in Nigeria, only about half of it is put to use, and Nigeria is the largest producer of cassava, cowpea and yam (these are staple foods in sub-Saharan Africa), yet, 65 percent of its over 170 million people are considered food insecure (FMARD; NAIP, 2013), there is clearly a problem here.

The challenge is that over 90 percent of the locally produced food is done by small scale farmers. These are farmers in Indigenous communities who cultivate small plots of land often with hoes and depend heavily on rainfall. They expect to make a living out of the little they produce, but they often run short of food especially during the pre-harvest period (IFAD, 2013). During the pre-harvest period, which is also known as “hunger period”, people use wild food to augment their food needs (Harris & Mohammed, 2003). The shortage of food pre-harvest is an indication of a lack of “stability” in such community’s food security (FAO, 2008). Other possible explanations to hunger periods could be production shortages and post-harvest losses due to the lack of proper storage systems (Enete & Amusa, 2010). While the nations various Indigenous food systems support many inhabitants, especially those in rural communities, there are numerous challenges that laden the food system and hampers on people’s ability to harness such potentials.

Diseases such as malaria, tuberculoses, HIV/AIDS, poor infrastructures, and social amenities, all contribute to lowered productivity in many rural communities across the country (WHO, 2013; IFAD, 2013).

Civil unrest also aggravates poverty. Religious and ethnic tensions continue to brew in some parts of Nigeria, erupting into outbreaks of violence which in turn results to escalating poverty and malnutrition (IFAD, 2013).

For the many vulnerable people living in Nigeria’s rural and urban communities, the reality is that food production needs to step up, but, in a sustainable way to conserve the already pressured natural resources, they may need to trade in food as a commodity to raise money to develop other sectors of their economy because in some cases, agriculture is all they have (like in the case of Kwall- the research site). Increase in production will mean using up more land, and developing their means of production and storage to protect them post-harvest.

They will need to shift from heavy dependence on rain-fed agriculture and look into other alternatives such as irrigation farming, in an event that rains fail due to adverse climate effects. Diversifying will enable them have all time access to safe, and nutritious food, that fits their preferences to lead a healthy and active life- these are all tenets of the concept of “food security”.

The choice of the concept of food security in this study is because of its flexibility in terms of context, and its realization that food security is a man-kind problem, hence we are all involved and therefore people should be able to share knowledge, preferences, and trade, to enable them develop their communities and increase their economic, social and physical access to safe and nutritious food for an active and healthy life. It is important to acknowledge that trade negotiations on agriculture should be carefully made in order to protect the most vulnerable in the deal- small holder farmers from developing countries, as also advocated by the *La Via Campesina*. But such moves should not destroy large scale producers either; who may sometimes be part of the vulnerable community that have come together to transform the lives of their fellow members through food production. In essence there should be a responsible, sustainable negotiation in collaboration with all interest groups.

Food security can be pursued on a global, regional, national or community/local level. The flexible nature of the concept has made it possible to contextualize it based on a peoples’ or community’s current realities. Some scholars argue that while it is important to assess food security on a national or intra-regional level because of issues with trade liberalization and negotiations, trends in food security such as poverty may not be fully evident at such levels (Clay, 2002). This is why this study is embracing the sub-framework of “community food security”, within the larger food security framework.

2.2.3 Community Food Security Framework

Community food security (CFS) is an emerging conceptual model of food security and as such has not universally accepted definition (Dietitians of Canada, 2007). However, one of the widely used definitions in studies on CFS is one proposed by Hamm and Bellows (2003), which states that:

“Community food security exists when all community residents obtain a safe, personally acceptable, nutritious diet through a sustainable food system that maximizes healthy choices, community self-reliance and equal access for everyone” (Hamm & Bellows, 2003: 37).

According to Hamm and Bellows, while CFS shares the principles of food security in terms of sustainability, health, community self-reliance from other sources and social justice, it puts the community at the centre of its workings by highlighting and making the best of existing community capacities in terms of the local food systems (Hamm & Bellows, 2003).

The term “community” in the term CFS promotes highly differentiated understandings that vary according to the geographic environment (size, location, environmental quality), the local political economy and the demographic identity of those defining food security (Hamm & Bellows, 2003). CFS offers a flexibility that various groups can adopt and contextualize according to their preferences and realities, be it cultural food preferences or the source of their food.

Food systems have an important role to play in ensuring food security, both on a national and community level and to that end CFS acknowledges that it operates within the spectrum of a larger food system, comprising of food chain components such as farming, wild food harvesting, storage, processing, distribution, composting, marketing, farmers, government,

traders, food policies, and grass root organizations (Mccullum, et al 2005; Dietitians of Canada, 2007).

For groups to get the most out of CFS in a harmonious way, Hamm and Bellows suggested that the group needs to identify problems, propose ways to solve those problems, and then channel those actions towards solving the problems (Lezberg, S. 1999; in Hamm & Bellow, 2003: 38). The CFS framework marries the food security and food sovereignty concepts by recognizing the central role that a community's Indigenous food system plays in achieving food security, but also community self-reliance from other sources.

2.2.4 Summary

Community food security cannot be realized outside a policy context (Dietitians of Canada, 2007:5).

Community food security is an encompassing effort towards food security, with an approach that acknowledges that communities have existing capacities in form of their food systems that could be built upon to enhance the community's food security and improve its people's livelihood. The CFS approach realizes that communities are different and so are their realities, the food security concept, which is where the CFS framework draws its principles from, acknowledges such differences in peoples food preferences, and in geographical, economic, social and political challenges that might hinder people from accessing food and therefore creates a flexible concept that can be shaped according to those unique characteristics. It acknowledges the struggles that marginalized members of society, like women and Indigenous peoples, who may likely face challenges in their efforts to access food.

For a country like Nigeria, who has a history of food security policies that are largely planned and executed from the top with little or no community engagement, the CFS approach might be a potential viable approach to future initiatives.

This research highlights a community with an existing Indigenous food system that can be developed upon using principles of CFS. It gives a traditional farming community like Kwall the opportunity to harness its potentials, exercise their cultural preferences in terms of food choices, and support community economic development for a healthy, prosperous and vibrant community.

2.3 Food Security Initiatives in Nigeria

Agriculture is the largest employment sector in Nigeria; it contributes up to 40 percent of the country's GDP and employs more than half of its population (IFAD, 2012). Most farming is done on a small scale, by men and women in rural communities, who despite their significant contribution to the economy, live below the poverty line (IFAD, 2012).

Majority of the agriculture in Nigeria is characterized by low output, poor return, and poor investment (Alabi, 2014). There is also high dependence on rainfall and the lack of capacity by farmers to embrace growth enhancing technology, largely due to poverty which cannot be considered a fault of their own (Osondu, et al 2015).

Poverty in Nigeria has been blamed on the poor performance of the country's agricultural sector, and the poor performance of the agriculture sector has been blamed on poor policies and initiatives that can enhance productivity and food security, sustainably (World Bank, 2015).

Food security or agriculture related projects in the past have made little significance in enhancing food security and improving the livelihood of small scale farmers, which explains the country's current state of food security.

Some of the post-independence (after 1960) agricultural policies that were geared towards enhancing national food security include: Operation Feed the Nation (OFN) in 1976, the Green Revolution in 1979, and the Directorate of Food, Road and Rural Infrastructure (DFRRI) in 1985 (Ojo & Adebayo, 2012). These projects have been largely described as failed projects, largely due to political instability, oil boom, corruption and the lack of will by the country's leadership to follow through with policy implementations (Ojo & Adebayo, 2012)

Since returning to democratic rule in 1999, Nigeria has been involved with international and local organisations, research institutions and non-governmental organisations to increase food production reduce poverty especially among rural population, revitalize communities by enhancing food security and rural development. Some of these projects are highlighted below.

2.3.1 NICANVEG Project (Nigerian, Canadian Vegetable Project)

The NICANVEG project is a research involving institutions from Nigeria and Canada- the Obafemi Awolowo University and the Osun state University, both from Nigeria, and University of Manitoba and Cape Breton University from Canada. The project was financially supported by the International Development Research Centre (IDRC) and the Government of Canada, provided through Foreign Affairs, Trade and Development Canada (DFATD).

The study explored underutilized Indigenous vegetables in four states (Oyo, Osun, Ogun, and Ekiti) in south-western Nigeria. The purpose was to work with rural farmers, especially women, to enhance the economic growth and food security of those communities by conducting scientific based experiments, marketing, awareness campaigns, and nutritional and economic analysis (IDRC, 2014).

By the end of the 42 month study period, reports show that 18 underutilized Indigenous vegetables had been identified, out of which 6 premium vegetables were selected for detailed agronomic and food quality study (IDRC, 2014). Some of the vegetables identified include: *Telfairia occidentalis* (Ugu), *Solanum macrocarpon* (Igbagba), *Amaranthus viridis* (Tete atetedaye) (IDRC, 2014).

Results also show that 1405 farmers, 51 percent of which were women had adopted various innovative and farmer-friendly agronomic technologies developed by the project team (IDRC, 2014). Women participation is important in this study because the project seeks to empower rural women who put so much effort into farming in rural areas, yet they constitute some of the poorest.

The team also reported that farmers increased their farm sized from 1.4 ha to 30.6ha. With that came an increase in production (30-50%), and improvement in the farmers' income- from US\$ 1994/year pre- project, to US\$ 4531/year post- project (IDRC, 2014).

The team developed a radio programme- *Ramo Elefo*, which is airs on 4 local stations in south-western Nigeria, and is said to reach an audience of about 4million people on a daily basis (IDRC, 2014). This awareness led to the acceptance of these vegetables which were under- appreciated and under-utilized prior to the project.

The NICANVEG programme is a typical example of how research and innovations which highlight Indigenous food can potentially yield positive results.

Due to the success of the NICANVEG, farming practices developed by the team are currently in the process of been implemented in some communities across West Africa in a new project which is described as a continuation of this one. This time around, it will involve the Obafemi Awolowo University and Osun state University, both in Nigeria, and University of Saskatchewan and University of Manitoba from Canada, and University of Parakou in Benin Republic. This time around, the project will aim to advance sustainable production and utilization of under-utilized Indigenous vegetables with minimal use of synthetic fertilizer termed “Fertilizer micro-dozing” in West Africa (MicroVeg Project, 2016).

Although the aim of this particular programme was focused on vegetables, it is important to note that these communities have other food base that form their Indigenous food system such as grains and fish, and in most cases meals comprise of various foods from the food system (NDHS, 2013).

Highlighting various foods within the country’s various Indigenous food systems will help create awareness of foods and options, be it for nutritional, medicinal or trading purposes. It could potentially help preserve the knowledge of those foods among younger members of the community.

2.3.2 National Special Programme for Food Security (NSPFS)

The NSPFS is an extension of an initial FAO assisted Special Programme for Food Security (SPFS) in Kano state, northern Nigeria. The pilot project in Kano was said to be successful, thereby prompting the federal government to extend the programme to all thirty six states of the federation, including the Federal Capital Territory (FCT) Abuja.

The broad objective of the NSPFS was to contribute to sustainable improvement in national food security through increase in food productivity and production on an economically and environmentally sustainable basis, reduce year to year variability in agricultural production and improve people's access to food (NSPFS, 2008). More specifically, the project aimed at assisting farmers to reach their full potentials by training them in improved farming practices and technology, drawn from both domestic and international research. The NSPFS was totally funded by the Federal Government of Nigeria (FGN), over a period of five years (2002-2007).

The food security project was conducted in 109 communities, each of which was expected to cover 250-300 farm families in the different regions of the country.

According to the FGN, production and profit per hectare increased by about 82 percent as a result of the programme (from thirty thousand, six hundred and thirty three naira, to fifty five thousand, eight hundred and thirty naira). Also, 10, 000 tons of Indigenous vegetables were produced through irrigation during the course of the programme. Inputs such as fertilizer, improved seeds and pesticides were also distributed (National Special Programme for Food Security, 2002 – 2006 (UTF/NIR/047/NIR) Evaluation Report October 2008). Just like other food security initiatives, the NSPFS has reviewed mixed reviews from different quarters.

A study to assess the impact of the NSPFS on income and productivity of beneficiaries in Plateau state revealed that the income and output of beneficiaries increased compared to non-beneficiaries of the project (Ephraim & Arene 2015). Although the study did not give specifics on details such as income and productivity of project users before their involvement with the NSPFS, so it is not clear how much impact the project had on these fronts.

A similar study conducted to measure the impact of NSPFS on poverty alleviation among women in Oyo state, south west Nigeria, reveals that the programme had a positive impact on

participants income and purchasing power, as a result of increase in productivity (Ayoade, et al 2011). Before the project, 97.6 percent of participants reported to not having any means of mobility (motor cycle or cars), but that number reduced to 91.6 percent after the project (Ayoade, et al 2011). The authors also reported increase in users' productivity and farm sizes, and although there were no changes recorded in participants housing condition despite their involvement with the programme, they concluded that the NSPFS had improved food security and poverty status of users.

On the other hand, a study that reviewed that evaluated the programme on a national level noted that there were shortfalls in areas of credit repayment by beneficiaries largely due to their inexperience in loan management, difficulties on the side of the users to adapt to new farming techniques and technology, which could be attributed to the poor contact and communication between extension workers and beneficiaries who are suppose to help educate these farmers (Iwuchukwu & Igbokwe, 2012). The high cost of farm input and poor access to modern storage facilities were other issues identified.

A study has pointed to one of the gaps in this project, which is communication between beneficiaries and officials (Iwuchukwu & Igbokwe, 2012). This speaks to the planning and execution of the programme and most government programmes in the country were plans are made and agreed upon away from the end users of such programmes (Ojo & Adebayo, 2012). If this programme had taken into consideration user's Indigenous knowledge, and work towards consolidating the two world-views (main-stream and Indigenous), just like in the NICANVEG case, there could be room for sustainability because users will just be adding to their knowledge and so a break or malfunction in the programme will probably not affect their activities as much.

2.3.3 PROSAB (Promoting Sustainable Agriculture in Borno State)

PROSAB is a project by the International Institute of Tropical Agriculture (IITA) and Borno State in Northern Nigeria, carried out to improve livelihoods of rural communities in Nigeria, improve their food security and to reduce poverty. The project was funded by the then Canadian International Development Agency (CIDA). It ran for four years from 2003-2007, and involved 300 producer groups from 130 cluster villages from 4 Local Government Areas (LGA) in Borno state (PROSAB, 2008).

PROSAB used a participatory approach to promote improved varieties of cereal and legumes, along with improved crop management practices. It also trained and linked farmers to market for their produce (Amaza, et al 2009).

In the North, major crops grown are cowpea, millet and sorghum. Food security in that part of the country depends a lot on weather and soil fertility, but quite often, poor soil fertility and uneven rainfall affects crop production (Amaza, et al 2009).

Prior to the project, food insecurity was measured at 58 percent in the study area. But at the end of the project, communities that participated in the project had their food insecurity lowered to 49 percent, while communities that did not participate in the project had their food insecurity increased to 61 percent (PROSAB, 2008).

The adoption of improved technologies and crop management practices led to increased crop productivity with implications for improved food security, increased incomes and better livelihood for the participating communities (Amaza, et al 2009:20).

This is an example of how food security initiatives can help improve livelihoods of people in rural communities across the country. Every region has its own unique challenges; hence

studies like this can highlight such challenges and resources channelled towards meeting those needs.

Although this study promoted the production and distribution of foods Indigenous to the region, it chose to leave out millet, which is also a useful Indigenous food in the region. No specific reason was given for the choice to leave out millet, but studies have shown that millet is an important cereal which does great in difficult conditions and is packed with nutritional benefits including vitamin B, calcium, iron, potassium, zinc and magnesium (Saleh, et al, 2013).

Nevertheless, the project successfully promoted the production of groundnut, which farmers almost abandoned in the area.

2.3.4 The National Fadama Development Project (NFDP) -FADAMA III

The FADAMA III project is a Nigerian Federal Government programme, which was founded through the pooled World Bank loan to develop Fadama potentials in Nigeria.

The word “Fadama” is a hausa (the major tribe in the north) word which refers to irrigable lands, usually low-lying plains under laid by shallow aquifers found along major river systems (World Bank, 2013). The Fadama land are subject to seasonal flooding which creates rich alluvial deposits that support all year crop production and rich pastures with low input requirement and high return. Fadama lands are said to have high potentials and agricultural value, several times more than the adjacent upland (Adegbite, et al, 2008:11).

The objective of the project is to sustainably increase food security and eradicate poverty by improving the income and productivity of Nigerians in rural communities. This project is a

sequel to previous Fadama projects-FADAMA I and II respectively, which have received mixed reviews about the success of the projects.

FADAMA III took a community Driven Development (CDD) approach, which places the users in the forefront in terms of design and implementation of the projects. The project was planned to happen over a four year period (2009-2013), however, it has been extended to end in 2017 (World Bank, 2016). The additional funding was done to support the previous governments Agricultural Transformation Agenda (ATA).

The establishment of a micro-finance bank in Plateau state and Implementation of the approved business plans covering 5,088 ha of farms across four value chains were some of the achievements reported by the programme team (NFDP-FADAMA III Implementation Status and Results Report, 2016:2).

Some of the earlier challenges identified by the team include the lack of commitment by state and local governments to make counterpart contributions, which is crucial to the project. The project is based on contributions from all level of government, World Bank and the beneficiaries.

Since the project is not over yet, it is difficult to get an overall national assessment, however, studies carried out in specific communities so far reveal some varying opinions.

Studies by Badiru (2013), on the impact of the project on beneficiaries in Ijebu, Ogun state revealed that these users were expressing concerns surrounding the slow pace of implementation of the project. This has lead to lowered expectations of the benefits, and so users are hesitant to meet their own side of the obligation in terms of equity contributions and adherence to procurement guidelines (Badiru, 2013).

A similar study that assessed the impact of FADAMA III on income and wealth of beneficiaries in Gwagwalada Area Council of the FCT showed that users of the project reported increase in their production asset; however, there was a decline in farmers' income (Bature, et al 2013). This decline, as reported by the authors might be due to the initial investment that farmers had to make in acquiring production asset, which they say may have impacted on their profits.

For communities that depend on their Indigenous food system for livelihood, i.e. as a source of income and food, committing their income or profit into huge investments such as the FADAMA III with little or no return impacts on their ability to maintain their food security (Bature, et al 2013).

There seem to be a lack of political will by state governments to pay their own part of the FADAMA III contribution in order for the programme to fully take off in most Indigenous communities across the country (World Bank, 2016). Although the programme has been extended, some beneficiaries have decided to take their faith into their hands, like the farmers in Plateau state who have set up a micro-finance bank from individual contributions.

This move by farmers is commendable, however, this types of sudden cut to their income has made it impossible for some of them to break even, despite investing so much and plunging themselves in debt. Though it has been argued that such income lost will be for a short period (Alabi, et al, 2014), it will be interesting to see how it will all play out by the end of the programme, when there is an evaluation.

2.3.5 Summary

The above section gives an outlook of how food security initiatives have thrived in Nigeria. With the exception of the NICANVEG which was planned and executed by researchers and

research institutes, the other three, PROSAB, FADAMA III and the NSPFS, all have some sort of government involvements and so, that top-down approach to planning and execution is manifested. The NICANVEG had the community at the centre of its research, the community was involved and that grass root approach led to the laudable review the project has been receiving. It is fair though to remember that the FADAMA III project is still on-going, hence it will be interesting to see the end result once it is over, but the historical experience of agricultural/food security programmes in Nigeria has made people sceptical about the efficacy of such projects. Some of the non-NSPFS beneficiaries in Plateau state attested to that being the reason why they chose to opt out of the programme (Ephraim & Arene 2015).

One striking similarity in the government food security programmes is the little or no inclusion of Indigenous food knowledge and the importance of preserving Indigenous food systems, although some of the programmes promoted the production of certain Indigenous foods, more work needs to be done. Like in the PROSAB example, Millet, which is an important Indigenous cereal in northern Nigeria and surrounding countries was not considered and promoted in the project. Similarly, more need to be done in terms of highlighting the value (nutritional and medicinal) of those foods from an Indigenous perspective. Most of the beneficiaries of those kinds of programmes are rural people with very little or no literacy, hence they can hardly make sense of scientific or mainstream interpretations regarding their foods. The knowledge system that most of them are familiar with is their Indigenous knowledge that has been practised through generations. Therefore, in order for greater grassroots inclusion and participation in governance, and for a greater acceptance of Indigenous food and the importance of Indigenous food systems, such knowledge should be highlighted. Although most of these programmes look great on paper in terms of their promises for community engagement, the actual execution does not always go in that path. Iwuchukwu & Igbokwe in their review of the NSPFS revealed that one of the

shortcomings of the project was the poor contact and communication between extension workers and the beneficiaries of the programme. This is a reflection of the difference that exists in the line of planning and actual execution. This lead to poor loan management and placing unnecessary burden on the rural farmers who already face challenges such as poverty and low disposable income (Iwuchukwu & Igbokwe, 2012).

The community food security approach that is study is proposing is one that will take into consideration, the community's food system and their knowledge. It will draw from their experiences and current realities to build a sustainable food security portfolio that could potentially assist the community to develop into a healthy, economically prosperous and vibrant community for all its members.

2.4 Indigenous Food Systems: Identification of Indigenous Foods and their Contribution to food security.

Indigenous foods in various cultures across Nigeria and Africa have been studied and their contribution to food security has also been highlighted from mostly two perspectives. First is their contribution to the nutritional needs of the people that utilize them, and how their medicinal value contributes to the health needs of these people.

Many Indigenous cultures across the globe use their food as medicine, and Indigenous people across the African continent have practised this for many generations to maintain the health and well being of members of their community (Locket, et al 2000), so in this context, a food security discussion involving Indigenous cultures would not be complete without highlighting how food serves in the capacity of medicine because for most of these cultures, there is no clear difference between food and medicine. A more elaborate discussion about the relationship between food and medicine is provided under section 5.2.

Some literatures that focus on both nutritional and medicinal value of Indigenous foods will be reviewed under both sections in order to highlight those perspectives.

2.4.1 Indigenous Foods and their Contribution to the Food and Nutritional Needs of Communities

Studies of Nigeria's Indigenous foods and their contribution to the nutritional needs of communities have been done from both the scientific and Indigenous based knowledge perspective. It is important to note that the majority of published studies on Indigenous food systems out of Nigeria tend to favour more scientific based perspectives, with limited representation of Indigenous knowledge based studies. This is why this study is privileging Indigenous perspectives in order to contribute in filling that gap. Studies that highlight both perspectives will be reviewed under this section. This could potentially foster cross-world view learning.

A study of foods commonly consumed by Nigerians was done to determine their mineral content; these foods include both Indigenous foods and imported or processed foods that people utilize on a daily basis (Onianwa, et al 2001). The study was interested in determining specifically the concentration of copper and zinc in the foods. Copper is involved in the formation of red blood cells and the proper functioning of organs such as the heart and brain. The lack of copper may lead to anaemia and osteoporosis (Mason, 2011). Zinc is needed for steroid hormone formation in the body and a deficiency of it causes growth inhibition that could result into stunting (Roohani, et al 2013). Testing was done on various classes of foods ranging from vegetables, to tubers, and legumes. In total about 80 food items were sourced from a local market in Ibadan, which is located in the South western part of the country. The idea was to determine whether Indigenous foods give more nutritional benefits than processed or imported foods that may be commonly eaten, but not necessarily Indigenous to

the community. Results revealed that the highest concentrations of both metals were found in legumes. The Indigenous melon specie (eguisi) contained significant amount of both zinc and copper, 28.2 mg/kg and 12.5mg/kg, which is above the daily recommended dose of 15mg/day and 2.5mg/day respectively. This study is very important because a significant number of children in Nigeria experience stunted growth or dwarfism (NHDS, 2014), which are among the symptoms of copper and zinc deficiency. This study was conducted based on foods sourced from markets in an urban centre, the rural people usually face the most problems associated with mineral deficiencies and malnutrition (IFAD, 2009), and hence a study that will identify more Indigenous alternative sources of essential nutrients will give people more choices. This is what Lockett, et al (2000) did in the North eastern part of Nigeria. Their study on the energy and micronutrient composition of dietary and medicinal wild plants consumed during drought in that region revealed varieties of Indigenous plants that contain essential nutrients and medicinal components. Two rural communities, Amtasa and Donga were the site for the study. Indigenous edible wild plants were collected with the help of community elders and tested for their nutrient content, while participants shared their knowledge on the medicinal uses of those plants. Plants such as the zogale (*moringa oleifera*), was found to be high in protein, fat, iron, copper and zinc. The tsamiya (*tamarindus Indica*) is soaked overnight and drunk in the morning to relieve constipation, it is drunk by pregnant women during pregnancy in anticipation of reducing labour pain, and it is a good source of zinc. Other plants such as dorowa (*parkia biglobosa*), was found to be a good source of protein, fat, calcium, iron and zinc. The seed of dorowa is applied to snake bites to draw out the venom. Lockett's study revealed that women seem to be more knowledgeable in identifying Indigenous species, compared to their male counterparts. This was evident in the study, as women were seen to identify more wild plants than the men.

A study on how Indigenous foods harvested by women from forests in Kwara, Plateau and Niger states North central Nigeria showed that, foods such as fruits, mushrooms and snails, help meet the food security needs of people, and enhances the livelihood of women because they earn some income from the sale of fruits, medicinal plants, snail and grass (Adedayo, et al 2010). Out of the 240 respondents in the study, 60 percent of them say they realize more than 50 percent of their total income from the sale of foods and other resources harvested from the wild, like fire wood and broom. Such incomes assist in the payment of school fees, medical bills and the purchase of other food items to complement their diets. The authors are suggesting that because people are already harvesting these foods from the forest, increasing access to the forest will result into greater food security for households in the community.

In their study on the importance of non-wood forest products, Chukwuone & Okeke (2009) further highlighted the role of wild foods in supplementing household food security. Data collected from interviews of 400 randomly selected households in Rivers and Enugu states revealed that non wood fruit products appeared in the meals of respondents for 43 percent of the time, and the sale of foods such as bush mango, a`fang, and oil bean, which were mostly utilized by the respondents, helped them generate some income. The authors suggested that the high dependence on forest foods should spur a policy drive that will sustain such species. Some of these species are endemic to Nigeria and have adapted to local conditions (Adebooye & Opabode, 2004).

In order to highlight the value of Indigenous foods endemic to the region; Agboola (2004), examined the uses of *prosopis africana* (mimo saceae), a specie that is considered endemic to Nigeria. The study explored the various ways in which the wood, seed and roots of the tree is utilized by the Tiv, Igala and Idoma Indigenous tribes of Nigeria. The study revealed that the seeds from the tree are used in making “ukpehe”, a traditional condiment which is high in protein. Wood from the tree is used to make hoes, and axe handles, pistons and mortar for

grounding food items. Furthermore, wood from the tree is used to make charcoal, 80 percent of the charcoal used across the country comes from the guinea savannah, which is characterised by the *prosopis africana*. Leaves from the tree are used to feed livestock as well. This is one of the unique characteristics of Indigenous species, where one plant can serve numerous purposes. At the end of the day, less is wasted.

The multiple uses of Indigenous species have been reiterated by Harris & Mohammed (2003) in a study that identified wild foods in Dagaceri village in Jigawa state, in Northern Nigeria. 67 wild foods coming from 53 species of plants were identified by community members. Some of the plants, such as tsamiya (*Tamarindus indica*) produce more than one edible product like the edible flower, seed and fruit. 16 plants were identified as foods utilized during “hunger periods” (when farmers are waiting for harvest). The authors concluded that Indigenous foods are an important coping strategy for rural communities and they play a significant role in promoting sustainable rural livelihood.

Similarly, Effiong & Udo (2010), examined the nutritive values of four Indigenous foods, but in their case, they considered wild fruits consumed in south eastern Nigeria. Fresh samples of ewanga or white rubber vine (*landolphia oweriensis*), ekom or gaboon nut (*caula edulis*), ekporo or African walnut (*conophorum tetracarpidium*), and ubon mbakara (*attacarpus heterophylla*), were collected from Okpoto Nkwot and Ikot Okure communities in Akwa Ibom state, Nigeria. Results from lab test show that all four Indigenous fruits have high contents of carbohydrate, crude protein, crude fat and some mineral contents such as iron, manganese, zinc, copper, potassium and phosphorus. These fruits according to the authors can compare favourably with exotic fruits such as banana, avocado, guava and mango in terms of their nutritional content. Community members attested to using these fruits for medicinal purposes as well. They serve as detoxifying substances and laxatives for stimulating bowel movement. The authors suggest that because of the availability of these

fruits in communities, they can be utilized to combat “hidden hunger”, which is caused by micronutrients, minerals and vitamin deficiencies.

Since food security is not only concerned with the availability of food alone, but also the nutritional content of food, it is important to highlight that aspect, if a case is to be made for Indigenous food. These studies revealed that Indigenous foods contain essential nutrients needed for leading a healthy life, and by extension, creating vibrant communities.

Nigeria’s Indigenous melon specie or egusi (*Cucurbitaceae spp*), for example contains significant amounts of zinc and copper; these are important minerals because a significant number of Nigerian children suffer from stunted growth or dwarfism, which are among the symptom of copper and zinc deficiency (NDHS, 2013). It is also a rich source of protein and fat (Onianwa, et al 2001). Other Indigenous foods such as ekom or gaboon nut (*caula edulis*), and ekporo or African walnut (*conophorum tetracarpidium*), are said to have high contents of carbohydrate, potassium and phosphorus, which can be utilized to combat deficiencies (Effiong & Udo, 2010).

While efforts have been made to identify Nigerian Indigenous foods, most of the studies are focused in the southern part of the country. The north which is developmentally disadvantaged (World Bank, 2015), is underrepresented in literatures. The recent security challenges due to civil unrest and insurgency has further exacerbated the food insecurity situation (UN, 2015). Some of the areas identified for future research under this theme include a need for further identification and documentation of Indigenous foods (Effiong & Udo, 2010).

2.4.2 Indigenous Foods and their Contribution to the Medicinal Needs of Communities

Studies on Nigeria's Indigenous food systems show that many Indigenous groups value their food not only for its contribution to their nutrition, but for its importance in maintaining their health. In some cases, medicine is consumed in foods as part of daily meals and in other cases separate medicinal solutions are made out of combination of various foods.

Oyetayo, 2011 examined the medicinal uses of mushrooms Indigenous to Nigeria. This information was gathered from Indigenous herbalists (medicine people) that are involved in picking, preparing and administration of these herbs. Twelve varieties of mushrooms were identified; among them were the *pleurotus tuberrigium*, which is used for treating headaches, cold, fever and stomach upsets, and *schizophyllum commune*, which is used for treating diabetes. Nutritional testing on these Indigenous mushrooms also revealed them to be an excellent sources of protein, carbohydrate, fat, and essential vitamins. These mushrooms can also be used as agents of bioremediation, especially in the recycling of wastes of agricultural origin, and in the healing of soil. An ethnobotanical study by Nwosu, 2002 of some pteridophytes Indigenous to Nigeria highlighted 36 plants utilized as medicine, food, fodder and manure. Herbalist in 40 Indigenous communities in the southern part of the country identified plants such as the erect sword fern which is commonly referred to as "nma ozo" in southern Nigeria is eaten as food (the tubers), and the infusion of fronds is administered to elderly persons for the treatment of amnesia. Nwosu noted that dosage pattern varied among herbalists because medicines are administered according to the severity of the ailment and the experience of the herbalist. There was evidence of knowledge transmission in some of these communities, however she reiterated Oyetayo's point that more studies on Indigenous species will not only preserve knowledge, but will create more acceptability for traditional medicine.

A study by Sonibare, et al 2009 on medicinal plants used to cure measles among the Yoruba people of Ogun state in south-western Nigeria further highlights the versatile uses of Indigenous foods in that region. 20 respondents made up of herbalist, herb sellers and elderly community members were able to identify 23 Indigenous species utilized for such purpose. This particular study was prompted by the high prevalence of measles among children in that area and the acclaimed traditional medical intervention practised by the people. Plants most frequently used include: *Elytraria marginata Vahl*, and *vernonia amygdalina Del* (Sonibare, et al. 2009). Similarly, an ethnobotanical survey of medicinal plant used for the treatment of malaria among Indigenous communities in the same region revealed a copious deposit of medicinal plants (Olorunnisola, et al 2013). 250 informants were able to identify 40 Indigenous species they utilize for the treatment of malaria. Among the plants identified is bitter leaf (*vernonia amygdalina Del*). The bitter leaf, which is used in combination with other plants to make medicine for malaria is also consumed as food (Olorunnisola, et al 2013).

The versatile nature of Indigenous food was further highlighted by Locket, et al in their study to examine the dietary and medicinal value of wild plants in north eastern Nigeria. While they were able to identify foods with energy and micronutrient composition, they also determined that some of those foods such as dorowa (*Parkia biglobosa*), with rich contents of fat, calcium, protein and iron, is also used for medicinal purposes. The oil extracted from the seed is applied on snake bite to take out the venom (Locket, et al, 2000).

The role that Indigenous food plays in people's lives goes beyond just satisfying hunger. Nutritious and safe food goes a long way in preventing health problems (NDHS, 2013) and people in Indigenous communities across Nigeria get the additional benefit of their food in their ability to make medicine out of it. As evident in the above reviewed literatures, medicinal solutions are made out of food; it is food in a different form. Most of the literatures

highlighted Indigenous medicinal knowledge, which is important in creating more awareness about uses of Indigenous food. Again, more of this perspective needs to be highlighted for better acceptance of Indigenous foods (Nwosu, 2002), especially in underrepresented regions such as the north.

2.4.3 Summary

If there are concerns about how much role Indigenous foods can potentially play in meeting people's food security needs, then the above reviewed studies have shown that there is a potential waiting to be harnessed and developed. While it is said that wild food harvest alone may not sufficiently and sustainably solve the problem (Nwajiuba, 2012), it is seen that in many cases communities have mastered the art of domesticating and reproducing these species through farming and gardening through many generations (Dweba, et al, 2012). It is important to remember that majority of the people that are considered food insecure in Nigeria are mostly in rural areas, living below the poverty line, with none or little formal education (IFAD, 2012). And while scientific verification of Indigenous food is good for wider acceptability and cross-cultural learning, it is pertinent to note that the people most affected by food insecurity need to get relevant food information in a form that they can relate to. If promoting Indigenous knowledge of the nutritional and medicinal value of foods in their various food systems can potentially make a difference; then such perspectives should be strongly encouraged. More studies that focus on identifying the country's copious Indigenous food capacity can only shed more light on existing capacity that can potentially be developed.

2.5 Challenges Associated With Accessing Indigenous Foods in Nigeria

Challenges associated with accessing Indigenous foods in Africa have been studied from different perspectives. Sometimes, the geography or environmental conditions of a community can pose a challenge to its member's ability to access food; especially farming. Other challenges may be in form of governance or the political situation, which may result into poor policy formations, underdevelopment, civil unrest and political instability.

For the purpose of this study, "access" to Indigenous food refers to the various ways people get those types of food. The major ways by which most Indigenous communities across Africa access their food are through farming and wild food harvesting (FMARD, 2015). But people are also increasingly involved in buying food, a practice that was alien to some Indigenous cultures in the past (Riga, 2015). Some Indigenous communities also practice sharing and exchange, like the Kwall community.

Challenges under this section will be examined under environmental/physical challenges and political/governance challenges with sub-categories to further expatiate on topics.

2.5.1 Environmental Challenges

Climate change, deforestation, desert encroachment, pest and diseases, urbanization and lack of pollinators have all been identified as threats to Africa's Indigenous foods (UN-IPCC, 2007; Kuwali, 2008; Jagtap, 2007). Sub-Saharan Africa (SSA) is said to be more vulnerable to the effects of climate change because a significant amount of its population live in rural areas and depend heavily on rain-fed, small scale agriculture (Webber, et al, 2014; IFAD, 2012). Cereal yields across SSA are expected to continue dropping as a result of climate change (Thornton, et al, 2009), this is especially disturbing for Nigeria because cereal and root crops constitute more than 80 percent of its agricultural produce (NPAFS, 2010). Some

of these Indigenous cereals such as sorghum and millet are important for the food security of neighbouring countries such as Niger Republic, which depends on Nigeria's ability to produce such foods (Diao, 2010).

Climate change is the variation in global or regional climates over time (Odoh & Francis, 2012).

Climate change and its resultant effects warms the waters and threaten fishes, it brings inconsistent rainfall and higher temperatures that affect crop yield, livestock and wildlife, which serves as major food supply to a significant number of Indigenous peoples across Nigeria (IFAD, 2007). Nwajiuba, 2012, argued that climate change and population dynamics constitute the two central challenges facing Nigeria's agricultural sector. The rationale is that Nigeria's population is growing and its food security challenges will grow with it, unless there is a change in the approach to food harvesting and production. If it is unable to feed its people now, it will be challenging to do so in the future when population is projected to reach between 230 – 430 million people in 2050 (Nwajiuba, 2012:4). Even though Nwajiuba raised concerns on how Nigeria will be able to meet this demand for food supply without hurting the environment, he is suggesting that the potential for feeding Nigeria's growing population organically is unclear; hence a model for sustainable agriculture that will utilize existing capacity efficiently without adverse social and environmental effects is needed.

In their study on the impact of climate change on food production in Nigeria, Mereu, et al 2015 used crop simulation models in a software (Decision Support System for Agrotechnology Transfer-Cropping System Model), to make predictions about how much effect climate change will have on Indigenous foods such as sorghum and millet and other staple crops like maize, cassava and rice. In order to do that, databases of weather, soil, variety and crop management from the seven different agro-ecological zones (AEZ) of the

country were used (Mereu, et al 2015). Results show that climate change impacts on crops are projected to be considerably different between crops and AEZ's. There are expectations of decrease in crop yields following climate change predictions in the short and medium term in all AEZ's (except Sahel area) and all crops (except cassava) (Mereu, et al 2015). The authors concluded that if the direct effect of CO₂ (carbon dioxide) is not considered, reduction in crop yields, especially cereal is expected in the medium term (Mereu, et al 2015:333).

A similar study conducted in Sokoto state-north western Nigeria to examine the impact of climate variables (rainfall, temperature and humidity) on major cereal crop production shows that while rainfall is not significant in explaining the effect of climate change on cereal production, increase in temperature affected the yield of cereal (Ayinde, et al 2013). This study also specifically mentioned how high temperatures can affect yield of millet, which is an Indigenous grain with significant nutritional importance.

A study in Niger state-north central Nigeria shows how humidity can affect crop yield. The study evaluated the effect of climate change on rice production, and found out that an increase in humidity affects rice yield. The authors put it that 1 percent increase in humidity, caused 17 percent decrease in rice yield, while a 1 percent increase in the minimum temperature of the area, caused 52.3 percent increase in production (Ayinde, et al 2013).

Seasonality of food is an important aspect of Indigenous food system because for people who depend on wild harvesting, they have to take cognisance of the time of the year a particular type of food is available in order to take full advantage of the availability. One study shows that food harvested during the raining season are most likely to be negatively affected by climate change, which could come in form of too much rain that could destroy the harvest, or shortfall of rain that can delay plant maturity (Eregha, et al 2014).

Drought especially in the northern part of the country, and flooding across communities, are some of the ways climate change manifests itself in Nigeria (FMARD, 2013). These negative effects have been responsible for destruction of Indigenous foods and other natural resources, there by presenting a situation where people are competing for limited resources (Odoh & Francis, 2012). These kinds of tense situations have resulted into conflict between farmers and pastoralist who move around with their herd in search for food (Odoh & Francis, 2012). While it is important that anthropogenic factors such as tree felling, has contributed to the depletion of wild food, the role that climate change plays cannot be ignored.

Deforestation, in form of logging, tree felling for fuel wood purposes, forest clearing for agricultural purposes and new constructions, all constitute human activities that affect access to Indigenous species (plants and animals) that serve as food and source of livelihood for many communities in Nigeria (FAO, 2006). Forests are often thought to be synonymous to timber trees for construction and paper manufacturing purposes, however, past and recent studies have revealed the benefits of forests to food security, and how forests can be beneficial and not be at odds with agriculture (Falconer & Arnold 1988; Faleyimu & Agbeja, 2012). Forest lands in Nigeria include high forests, bush lands, woodland, trees on farms and plantations (FME, 2006). Besides timber, forests house Indigenous species of plants and animals(rodents, birds, reptiles, and other small animals) that serve as an affordable source of protein, vitamin, fibre and fodder to many communities across the country (Okali et al, 2001). In Nigeria, 105 Indigenous woody plants from the different vegetations zones have been identified as been beneficial to meeting people's food security needs (FME, 2006). The rate of deforestation in the country is quite alarming, it is put at about 3.5 percent per annum, which translates to an average loss of 350,000ha to 400,000ha per annum (FME, 2006). The majority of Nigeria's rural population depends on fuel wood for their energy needs, in most cases it is the only source of cooking fuel. Demand greatly outweighs supply, and this is

largely due to population explosion, poverty and the lack of affordable alternative source of energy. The projected national demand for wood in the year 2020 is said to reach 180 million m², which is far from the supply which is less than 100 million m² (FME, 2006). Most of this wood comes from trees on the farms, woodlands, bush lands and plantations which all make up Nigeria's forest lands (FME, 2006). The country's forest is put at 10 percent of its total land mass (923,767 km²), and the government's policy is to conserve 20-25 percent of land under forest, but with the current rate of deforestation the future of these species is bleak. The government has made efforts in the past to curb deforestation by setting up guidelines on forest management, and in recent years the introduction of the National Forest Policy (NFP) in 2006. Such moves have not been able to yield significant results. Deforestation is said to have persisted due to poor enforcement and lack of investment in the sector (Faleyimu & Agbeja, 2012), and others argue that it is due to the lack of community engagement in conservation and management plans that have made it difficult for the country to make headway in its fight against deforestation (FME, 2006). After all, it is the rural people that contribute most to deforestation (about 80 percent of deforestation is said to be caused by felling of trees for fuel wood purposes) due to their socio-economic disposition (FME, 2006). Efforts have been made to set up plantations, mostly for industrial wood production. There is no clear indication on efforts to conserve or revive Indigenous species that serve as sources of food to many people in the country. All these plantations have been planted in forest reserves often at the expense of Indigenous plants (FME, 2006). Many Indigenous cultures have the principles of reciprocity and respect for the environment as part of their teaching; like the Ngas Indigenous people of north-central Nigeria, people are encouraged to only take what they need from the wild and make efforts to re-plant trees they cut down (Gwadap, 2008). Environment or the man-nature relationship can be beneficial to both parties; in the sense that, the environment provides man with food and resources for sustenance, and in return man

takes care of the environment. However, more often than not, human activities have exerted pressure on the environment so that, it reacts in ways that seem to threaten the existence of man. Human activities have lead to disturbance in the natural environment, and the manifestation is seen in deforestation, rises in temperature, and other extreme weather conditions, that has lead to the lost of food sources and affected livelihoods in many communities. The unfortunate thing is that, the ones that bear most of the brunt (Indigenous people in rural communities), are the ones that depend on the environment for their livelihood. Studies have shown how rise in temperature can affect crop production. Of course natural events do occur that man has no control over, but human activities make such effects more frequent. The feeling down of trees for fuel wood purposes will remain, unless there is an alternative source of fuel for those people that rely on firewood for energy.

In the midst of these environmental challenges on Indigenous food systems and people's ability to access their food, there are stories of resilience and traditional coping methods deployed by communities to mitigate occurrences such as climate change. This study highlights some of the framing decisions and practises by the people of Kwall in order to cope with such challenges. Studies in some Indigenous communities across Africa, shows that Indigenous communities in Ghana use traditional coping methods such as reusing water from household to irrigate gardens and observation of taboos that banned community members from fishing on certain days to reduce over harvesting (Gyampoh, et al 2009). However, changing dynamics with demographics and economic status has made people to abandon of these practices because they are under pressure to provide for their families by any means possible. This means that there is need for support and investment to harness the potentials of Indigenous food systems, and make sure not to lose them in the future.

2.5.2 Policy and Governance Related Challenges

The government, who are the chief policy makers in most countries sometimes, create policies that end up not favouring natural resource management. Although they take on such endeavours with good intentions, good intentions do not always end up good for all, especially the most vulnerable in the society who depend heavily on the environment for their food and income. Governments and large corporations sometimes want to make way for infrastructures such as dams for hydro generation, road construction and buildings in general. Quite often, agricultural lands, and forests that provide rural communities with their Indigenous foods often get sacrificed in the process.

Okonkwo (2012) studied the impact of the lower Niger River dredging on the livelihoods of Anam Indigenous people of Delta state. The Anam people derive their subsistence from fishing and farming. Dredging is cleaning out the bed of a river or other water body by scooping out mud, weeds and other matters with a dredge; often aquatic lives are destroyed in the process. The community benefits from the annual Niger River (one of two major Rivers in Nigeria) flood that brings rich alluvial deposits to their community and rich fish population. Alluvial deposits are conducive for crop production without the aid of fertilizer or any input. However, with the dredging done by the government, these livelihoods have been affected (Okonkwo, 2012). The study showed that the people's food security is been affected by this activity and the effect is taking a toll on the entire community in form of involuntary emigration out of the community, and conflict as a result of competition over limited resources (Okonkwo, 2012). This type of situation is an indication of insufficient consultation with communities and the lack of proper impact assessment.

In order for Indigenous foods to get wider acceptance, it is important that they become accessible (physically, socially and economically) by people, both Indigenous and non-

Indigenous members of a community. That is one of the principles of community food security- food security for all members of the community, vulnerable or otherwise. This is not always the case for all communities. In the case of Aba and its regions south eastern Nigeria, Okali, et al (2001) examined how migrants to the Indigenous community of Owerrinta are facing challenges accessing fishing and agricultural lands. In the community only Indigenes have access to fishing and lands are leased to non-indigenes on yearly bases for agricultural purposes, sometimes not under conducive terms (Okali, et al. 2001). Some of these migrants are second and third generation of settlers that came into the community during the colonial era, so their children know no other culture or home other than Owerrinta. While control over ancestral lands and resources are important for the self determination and self governance of Indigenous people, access to food for all is first a human right, and secondly could potentially help highlight the Indigenous foods and knowledge of the community even among non-Indigenous members who have migrated to that community over the years. Since evidence have shown that traditional food knowledge systems of Indigenous people is fast depleting (Okeke, 2009), teaching younger members of the society and new members of a community about the Indigenous food systems of that community could potentially help to preserve such knowledge. The Land Use Act in the country has no protection for such people, and local government policies do not address such challenges. While it is important to conserve Indigenous foods such as fish, regulations and policies can be put in place to cut down on excesses, while still allowing people get access to such foods in a culturally respectful manner. In the absence of clear title, small holder farmers cannot use their lands as collateral to access agricultural credit and this affects productivity (Tiri, et al 2014)

Government policy that subsidizes input, especially fertilizer subsidy has been criticized for its unintended negative consequences on small holder farmers in rural communities (Philip, et al 2009). Fertilizer subsidy became popular in the 60's through the 80's, and is still

part of Nigeria's agricultural policies. The most recent Agricultural Transformation Agenda of the past government had fertilizer subsidy as part of its incentives to farmers. The problem with this is, like other subsidies in the country (like the fuel subsidy), it has become expensive, unsustainable and a channel for corruption. Therefore, the real targets for such programmes end up not reaping the benefits. In this case, large scale farmers end up benefiting for what they do not really need. While increased access to fertilizer is said to be one of the drivers towards attaining food security in Nigeria (FMARD, 2015), the product still remain elusive to many small holder farmers in Indigenous communities across the country due to its high cost, despite many years of subsidy by the government (Tasie & Takeshima 2013). The use of fertilizer in Nigeria is put at 10 to 15kg/ha, which is much lower than other regions like Asia, where usage is at 150kg/ha (Philip, et al 2009); policies need to be put in place to avoid wastage and direct resources to the right targets. In a case study done by PrOpCom (Promoting Pro-Poor Opportunities in Commodity and Service Markets) and funded by DFID (UK's Department for International Development) between 2008-2011 to facilitate interventions aimed at improving the commercial marketing and distribution of fertilizer to the poor in Nigeria, an earlier study done by the organisation (PrOpCom) in a northern state was cited to give some perspective to the effect of agricultural policies such as fertilizer availability of farmer's ability to produce food. In that study, lack of access to supply was given as one of the reasons why small holder farmers do not utilize the product, stating that the politics involved in the access means that one would have to have an insider to help access the product (PrOpCom, 2011). So their chance of getting the product through due process is virtually impossible, not to mention that most input distribution stations are in urban centres, far away from the people that need it the most (PrOpCom, 2011). The reason for subsidy is largely because the country imports fertilizer, just like many other products. The major fertilizer producer in the country NAFCON (National Fertilizer

Company) shutdown since 2001, again this is an indication of poor policies because now it will have to source from outside of the country.

For the many farmers in the nations various Indigenous communities, farming happens to be the major way they access their food (FMARD, 2015). Farming in most of these communities is done in a small scale with hand tools, largely because they cannot afford to increase their production, due to issues with input and the heavy reliance on rainfall (IFAD, 2012). Such communities end up going into “hunger periods” and poverty continue to manifest in such communities (IFAD, 2012). Increased access to inputs such as fertilizer would help many farmers increase production and reduce hardship, because study show that many of the farmers in such Indigenous communities would welcome the use of fertilizer in cultivating their Indigenous food, but they simply cannot afford it (Tasie & Takeshima 2013).

The challenges faced by the Indigenous people of the Niger Delta region of Nigeria, is an example of how governance and policy implementation can affect access to Indigenous food. The Niger Delta is one of ten most important wetlands and marine ecosystem in the world because it accommodates important Indigenous plant and animal species, most of which are endemic to Nigeria (Kadafa, 2012). It is said to hold 60-80 percent of all Nigerian plant and animal species and is characterised by mangrove swamps, fresh water swamps and rainforest that supports the livelihood of the Indigenous people there (Ugochukwu & Ertel 2008). The Indigenous people of Niger Delta depend on the environment for food (fish, wild harvest of plants and animals, farming), but Nigeria depends on the region for 90 percent of its foreign exchange which comes from oil exploration from the region. After years of environmental pollution from oil spillage, gas flaring, destruction of biodiversity to make way for drilling, the Niger Delta has become one of five most severely petroleum damaged ecosystems in the world (Kadafa, 2012). Explosion of dynamite during exploration has destroyed aquatic life, burying of pipelines has destroyed biodiversity and oil spillage has made conditions

unfavourable for habitation (Ugochukwu & Ertel, 2008). Oil spillage poses a great challenge in the region and it is often unreported. Shell, which is the largest international company operating in the region recently admitted to 1,693 oil spills since 2007 (this number is believed to be much higher), and even after claims of clean up by the company, the UN and Amnesty International has found false claims regarding the situation. An Amnesty International research in 2015 found layers of oil on water and black sand at one of its spill sites (Shell's Bomu well 11), 45 years after the incident, even though it claimed to have cleaned up the site twice in 1975 and 2012 (Amnesty International, 2015). Yet, the Nigerian government, through its regulatory agency National Oil Spill Detection and Response Agency (NOSDRA) deemed it fit to certify the location clean and safe for habitation. Although the Nigerian government has all kinds of laws and policies in place to regulate the sector and protect the environment like the Oil Pollution Act 1990, the Endangered Species Decree Cap 108 LFN 1990, and the African Convention on the Conservation of Nature and Natural Resources 1968, among many others, it has done a poor job of implementing and enforcing these policies and laws towards the protection of traditional lands and the environment which are important habitats to Indigenous plant and animal species that serve as food and source of livelihood for the people of the Niger Delta.

2.5.3 Challenges with Traditional Land Tenure Practices and the Rights of Indigenous Women

In Africa, cultural practices relating to access to environmental resources such as land, has been identified as one of the major challenges to food security (FAO, 2002). This is especially difficult for women, who in many cultures have their rights attached to a male figure (Ikejiofor, 2006). They are often deprived of full access to farm lands, forest and

harvesting rights. This is an irony though because women in Africa are said to be responsible for the production of over 80 percent of the food across the continent (FAO, 2015). In most African countries, laws that prevail often reflect the culture of the people, so you will find that customary laws are practised alongside common/civil laws. This is the case with Nigeria. In that kind of scenario, there are sometimes conflicts of interest that are not too favourable to groups such as widows, orphans, and divorced women. Women and children are said to engage more in wild harvesting and sale of excess farm produce in most rural communities across Africa (Walker, 2002).

Ikejiofor (2006) examined the issue of equity in informal channels of land delivery through interviews and surveys of 100 land/ house owners in three Indigenous communities (Ogui Nike, Emene and Achara) in Enugu state south eastern Nigeria. Results from the study suggested rising cost and customary land acquisition practices creates an unequal situation in land accessibility, especially for vulnerable groups like women. Women are not entitled to land rights under the customary law that operates in the state, so a woman may only acquire land through her husband or male child. Such a portion of land, which is known as “okaabi” is allotted to her for farming. She does not have the power to dispose of such lands. This is the case for women in Indigenous communities, as regards to ancestral/traditional lands.

A study that examined women’s access to farmlands in Imo, south eastern Nigeria showed that although women are more involved in farming than their male counterparts in the community, women are more discriminated against when it comes to access and control of land than the men (Cornelius, et al 2011). Land inheritance is the most common way of land acquisitions in the community, and results revealed that 75 percent of the men involved in agriculture inherited the land they farm on, while 67 percent of the female respondents involved in agriculture had to purchase the land they use for farming. Also, 74 percent of the male respondents testified to having farmlands with sizes of 4 hectares and above as against

16 percent of the female respondents with that size of farmland. Yet, females recorded greater productivity throughout the period of the research that lasted from 2008-2011, compared to their male counterparts. This study gives an example of the challenges faced by many Indigenous women across Nigeria accessing food; this is despite their contributions to their community's food security through farming, food processing, meal preparation and wild food harvesting (FAO, 2015).

It is important to mention that the current statutory land rights existing in the country (the Land Use Act of 1978), does not discriminate against women in terms of their land rights. However, issues of cost and long bureaucracies hinders most small holder farmers and rural dwellers who cultivate over 90 percent of the food in the country (IFAD, 2012), from acquiring such lands.

This trend is also seen in some countries in southern Africa where Mutangadura (2004) examined the challenges women face in trying to acquire land for agricultural purposes. The study showed that although 70 percent of women in Mozambique, Botswana, Malawi, Zambia, Lesotho and South Africa, live in rural areas and rely on land for their livelihood through agricultural production, they are faced with discrimination in trying to acquire land (Mutangadura, 2004). In all six countries, statutory land tenure systems co-exist with the customary land system, so it makes things a bit complicated. In Malawi for example, women's access to land is tied to their marital status, in Zambia poverty makes the women not to be able to access the land, even if the laws are flexible and in Botswana, there are conflict in laws of marriage and inheritance that places women in a difficult situation.

2.5.4 Summary

Human-induced climate change resulting from increase emission of green house gasses (GHGs) and food insecurity have been identified as two closely related threats facing

mankind in the 21st century (IPCC, 2007). In an effort to access food and develop the society, man has engaged in tree clearing, destruction of natural vegetation and water, which in turn destroys Indigenous food systems (FME, 2006). It is like a circle, it is connected. Sometimes governments engage in infrastructural development such as the dredging of the Niger that tempered with the livelihood of Indigenous communities along the banks of the river (Okonkwo, 2012). Similarly, the lack of sustainable policy planning and implementation has lead to haphazard enforcement of forests management laws; in turn, many plants and animal species that serve as food sources to numerous communities across the country are depleting at an alarming rate (Faleyimu & Agbeja, 2012)). While most of the deforestation is been blamed on tree felling for fuel wood purposes, it is fair to mention that such people often have no alternative source of energy order than trees. Women, who engage most in fuel wood scouring as a result of their domestic responsibilities, are often the most disadvantaged when it comes to access to resources such as farmlands and inputs (Ikejiofor, 2006). Women in Nigeria and much of Africa by virtue of their role as home makers interact a lot with the environment (Walker, 2002). They engage in wild food harvesting, farm weeding, harvesting, food-processing and sourcing of firewood for meal preparation; in order words, they are custodians of their communities Indigenous food systems (Wane & Chandler, 2002). This means that women have a significant role in preserving the tress, harvesting and planting knowledge, and transferring such knowledge to younger members of their various communities. However, quite often, the approaches to solving these problems rarely include such groups who have close interaction with the environment for many generations (Walker, 2002). Studies have shown that Indigenous communities have traditional ways of coping with climate change, and they possess the knowledge regarding forest management and benefits (Yegbemey, et al 2014), that can be developed upon to come up with sustainable ways of accessing food. Quite often than not, economic and developmental circumstances of people in

those Indigenous communities make them turn to the environment for not only food, but fuel wood. There is no doubt that poverty amongst rural populace needs to be improved in order to curb some of the practises that are detrimental to the environment. Such commitments need strong political will and good governance, which is somewhat a challenge in Nigeria. This research highlights some of the challenges that Kwall community faces in accessing food, but it also highlights insights on how to improve on those challenges. Highlighting Indigenous food systems and their opportunities and challenges could potentially reveal challenges and give insights, from Indigenous perspective on how to move forward (Goji, 2015).

2.6 Literature Review Summary

Studies have revealed how Nigeria's various Indigenous food systems contribute significantly to peoples food security needs; Indigenous foods with both nutritional and health benefits are utilized by various Indigenous communities from north to south of the country (Chukwuone & Okeke, 2009; Adedayo, et al 2010). Most of these foods are accessed through farming, however, wild food harvesting has increasingly proven to be a viable way that some Indigenous communities access food, especially during "hunger periods", when food supply is low and people are waiting to harvest for the season (Harris & Mohammed, 2003). Most of the farming is done on a subsistence level, with small tools, little input and heavy dependence on rainfall (IFAD, 2010). This type of production is vulnerable to environmental or climatic dynamics such as change in temperature, rainfall patterns and extreme climatic conditions like drought or flooding (Webber, 2014). Some of these climatic or environmental events are further exacerbated by human activities in form of deforestation and infrastructural development, whereby, people alter natural habitats, which make up food systems that provide food and livelihood for people (Okonkwo, 2012). Over time, population increased exerting more pressure to the food system and in combination with developmental

challenges, poverty and human insecurity, these rural farmers who are responsible for producing most of the food locally produced in the country are finding it challenging to keep up (Ojo & Adebayo, 2012). Over the years, the country's leadership have invested in various agricultural/food security initiatives with the hope of improving the country's food security situation, but they have proven to be unsuccessful, giving the over 65 percent of Nigerians still considered food insecure and 80 percent of its rural population living below the poverty line (FMARD; NAIP, 2013). Failed agricultural policies, which is characterized by centralized decision making, disregard for Indigenous knowledge in form of grassroots input, and underinvestment in the sector, is said to be one of the major reasons for the country's failure in terms of its food security (World Bank, 2015). Corruption and bureaucracies have created a barrier for rural farmers to access input like fertilizer and loans to enhance production, and women who play a significant role in farming and as care takers of their various Indigenous food systems meet with cultural barriers in their efforts to provide for their households (Doss, 2013). All these constitute challenges to achieving food security.

The community food security approach that is study is proposing is one that takes in to cognisance the existing potentials in a community, and develops on such potentials for the good of all community members. In this case, the Irigwe Indigenous food system, despite its challenges, presents an opportunity that could be built upon and potentially help in improving people's situation in the community. Such models could potentially be used in other neighbouring Indigenous communities as well. What is study is doing is to highlight the various Indigenous foods utilized in Kwall community, and their nutritional and health benefits. This is to show that such foods indeed have the potentials to help improve the food security status of the community. By also highlighting challenges and solutions from an Indigenous perspective, policy makers and interest groups could design their policies and programmes to potentially fit such suggestions.

CHAPTER THREE

3.0 RESEARCH DESIGN, METHOD AND ANALYSIS

3.1 Background

This study was informed by both the social constructivist worldview (Creswell, 2009), and the Indigenous worldview (Chillisa, 2012). This research deals with an Indigenous ethnic group, which has gone through colonization as well, therefore, the social constructivist worldview allows participants to develop subjective meanings to their experiences (Creswell, 2009), and the Indigenous worldview attempts to resist universalized knowledge, critique Euro- western research approaches, and invoke Indigenous knowledge system of the colonized other to inform research methodologies that are inclusive of all knowledge systems and respectful of the researched (Chillisa, 2012; Pp. 24). In this study, the people of Kwall will not only share their Indigenous knowledge, but they will give interpretations to their experiences and have the opportunity to decide on how they would like to see their challenges materialise into success for the good of their community and its members.

3.2 Research Design

This study proceeded as a qualitative research, with case study as its strategy of inquiry. This choice is informed by the exploratory nature of the study which entailed going into the community to find out about the people's relationship with their foods. Qualitative research is multi method, involving an interpretive, naturalistic approach to its subject matter. This means that researchers study things in their natural settings, attempting to make sense of or interpret the meaning people bring to them (Michael, 2001). Being a case study, detailed information was collected using various data collection procedures (Creswell, 2009), as explained in the data collection and methodology section below.

3.3 Data Collection Strategy and Methodologies

3.3.1 *Time line, selection of community and participants*

Data was collected over the span of 9 weeks (July, 2015-October, 2015) during the raining season months when farming was at its peak. Purposive sampling was used to identify elders in the community. This was done with the help of the community chief. The chief and his council members know their fellow community members that have been practising farming for medicine picking, so the selection of those elders were done based on their knowledge and practises which is known by other community members. Snowball sampling was used to identify other potential participants; The elders identified earlier in turn identified 30 participants (18 men and 12 women) between the ages of 18 and 80 who are knowledgeable in the field of Indigenous food and are willing to participate. These are people that are known by community elders, peer group, and family members, to assist in cultural teachings about food, meal preparation during festivities, lead parties of foragers, and pick medicine for community members. The wide range in age and sex of the participants gave room for a generational knowledge insight and gender based learning.

The community of Kwall in Bassa L.G.A was chosen because of its distinct farming culture which makes it ideal for a study on Indigenous food and knowledge. Even though they still practise their traditional way of life, it will be interesting to find out how they strive to preserve that tradition and deal with emerging challenges in today's dynamic world. This could provide insights for strengthening the State's food security. Furthermore, the choice of Bassa is informed by the researchers ability to speak and understand a common language that is spoken in the locality- *hausa* , this has helped enhanced the research process by avoiding miscommunication that may occur due to language barrier and loss of meaning that may occur during interpretation. Again, the researcher is privilege to be aware of some of the

cultural protocols observed in the community such as gender responsibilities and farming rituals by virtue of past interactions with some Irigwe people. This knowledge helped the researcher build a respectful relationship with the community throughout the process.

3.3.2 Methods, Data Collection Procedures for Specific Objectives

The community played a significant role in shaping the structure of the objectives, leading up to the interviews. Initially, the study aimed at only highlighting contributions made by women in the community to their food security, and to focus on traditional farming methods alone. However, after sharing proposal with the community, there were suggestions given according to their current realities, which informed the study as it is. For example, it was suggested that more men engage in medicine picking than women in the community so in order to get a true perspective, men need to be included in study. While considering such suggestions, the following data collection procedures were used for the various objectives:

Objective 1- To identify the various Indigenous foods utilized in the community and their nutritional and medicinal benefits.

Semi-structured interview and talking circle was conducted for the 30 participants. The semi-structured interview was conducted for each participant individually and talking circle was done as a group consisting of all participants. Semi-structured interview was used because of its flexibility on the type and sequence of questioning (Wengraft, 2001). Here open questions that initiated discussions were asked. This allowed participants to not only identify foods, but share stories behind such foods. Also, talking circle was used as oppose to focus group discussions because of its informal and fluid nature. With talking circle, cultural protocols were incorporated like traditional prayers and symbolic food sacrifice. Talking circle fostered group knowledge sharing. Because participants and the researcher took turns to talk in a circle, everyone was placed on the same level and the discussion was largely driven by the

participants. Any possibility of the researcher asserting a position of control was avoided (Struthers & Penden-Mcalphine, 2005). A copy of the questions is attached in the appendix.

Participants had the chance to discuss and give their own interpretations and understanding of the phenomenon (Creswell, 2009; Chilisa, 2012), in a culturally respected space. Issues concerning anonymity and confidentiality had been settled during the consent seeking process prior to the commencement of the interviews. While confidentiality and anonymity was challenging to maintain in a talking circle since it was a forum where participants discussed openly to the hearing of all taking part in the circle, participants were encouraged to keep discussions within the circle confidential. The researcher has honoured request from participants who do not wish for their names to be associated with their narratives, such names are not included in this study, and instead they go by numbers.

A seasonal calendar was also used to highlight the seasonality of various foods identified within the Irigwe food system. Some Indigenous foods, especially those harvested from the wild are seasonal, so a seasonal calendar gives an overview of the types of foods that are available at various seasons. Domesticated foods that are normally gotten through cultivation may be available through the year because of their ability to be stored for certain periods of time before the next harvest. However, a seasonal calendar gives an idea of when such foods are been consumed the most, which is usually when they are harvested.

Objective 2- To explore the challenges associated with accessing Indigenous foods

Semi- structured interview and talking circle was also used to collect information from all 30 participants regarding challenges. Participants expressed their views on what they consider as challenging in their bid to produce, harvest and consume Indigenous foods. Since in the Irigwe culture some knowledge is considered a collective asset by family members or peers,

some participants prefer to share some food knowledge as a group. The talking circle created the opportunity for collective knowledge sharing.

Objective 3- To generate suggestions for recommendations to strengthen food security from the Irigwe perspective

Information regarding participants' suggestions and recommendations on how to improve their Indigenous food system for a better community food security was collected during the talking circle session and from individuals during their various interviews. Past literatures on the topic of Indigenous food from Nigeria and Africa and archival documents were consulted to get perspectives on how the country is faring regarding investments in Indigenous food systems over the years.

3.4 Data Analysis

Data analysis in a research is an ongoing process involving continual reflection about the data, asking analytical questions and writing memos throughout the study. Qualitative data analysis is conducted concurrently with gathering data, making interpretations and writing reports (Creswell, 2009).

Data analysis for this study was done through the following process:

1. Organising and preparing raw data – This involved transcribing taped interviews, typing field entries, observation and journals, and organising images and information gotten from archival materials.
2. Coding- Coding entailed thorough reading of the data and making detailed analysis. It was done in two steps. First was manual coding, here themes that had emerged from the transcript were assigned to interviews. Secondly, a data analysis soft ware-NVivo was used to organise the data and codes/nodes. After going through review by the

thesis supervisor, the data went through a third round of coding to capture details that were missed.

3. Descriptive statistics (percentages and mean) were used to summarise the data and provide measures used to generate charts. These charts are simple ways to describe what the data shows. ($n=30$)
4. Microsoft Excel was used to generate pie and bar charts.

3.5 Validity and Reliability of the Study

Whatever the paradigmatic assumptions that guide the research process, the resulting studies should be convincing enough that research participants can see themselves in the description, and all stakeholders, practitioners and policy makers should be confident to act on the findings and implications of the studies (Chilisa, 2012:164).

The following steps have been taken to ensure the validity and reliability of this study:

3.5.1 Credibility

Since qualitative research relies on human interpretation, understanding and perception of a phenomenon, there are expectations for unique outcomes or realities (Chilisa, B. 2012)

The following steps have been taken to ensure the credibility of the research:

1. Member Checking – Participants had the opportunity to check transcripts from the interview to ensure a true representation of their narratives. This was done at various points during the research. First, after each interview, the researcher presented a copy of the interview to the participants to verify whether it is a true representation of what they shared. After coding was finalized and a first draft was written, a copy, which was void of any personal identifiers, was mailed to the community representative to cross check details.

2. Triangulation- Data were collected through various means such as content analysis, interviews, sharing circle, observation, pictures, seasonal calendar and archival document review. Compiling data from all these sources provided a more reliable data.
3. Auditing– The thesis supervisor has audited the coding category naming to make sure it adheres to acceptable ethical and academic standard.
4. Bias clarification- The researcher has clarified the bias relating to her cultural background and upbringing, under the section **3.6 (Self Positioning and Ethical Considerations)**.

3.5.2 *Transferability*

Because of the uniqueness of human story, generalization in qualitative research has to be done cautiously (Creswell, 2012). This study meticulously selected participants who have similar understanding of the central issue, and the researcher took the following steps to ensure that results can potentially be transferable:

1. Intensity Sampling- The study community was chosen because of its tradition of farming and wild food harvesting, which makes it ideal for a study on Indigenous food and food security.
2. Purposive sampling- Elders in the community, through the help of the community chief, were approached and requested to identify individuals who are known to be knowledgeable in the field of Indigenous food. This ensured that interests groups in the community, like women, medicine people, youths, the elderly, market women, and elders were all represented in the study.
3. Snowball sampling- Individuals initially selected, went ahead to identify other members of the community who were willing to participate.

4. Rich description of research site- A dense description of the community's history, subsistence, vegetation, population and climate were provided in this study.

Highlighting the characteristics of the participants alone does not give enough details to make generalization, but a detailed description of the study site can give users the confidence to transfer results to a similar setting (Chilisa, B. 2012).

3.5.3 Dependability

Consistency is crucial to making a study reliable. Coding for this study was done in three rounds, manually, with the aid of qualitative research software (NVivo), and manually again.

3.6 Self Positioning and Ethical Considerations

In qualitative studies, the researcher is an instrument of data collection (Denzin, et al, 2005). This means that data are mediated through this human instrument, rather than through inventories, questionnaires or machines. To fulfil this role, the end users of the research need to know this human instrument. The researcher needs to describe relevant aspects of self, including any biases and assumptions, any expectations and experiences to qualify his or her ability to conduct the research (Greenbank, 2003).

Coming from a minority Indigenous group from north- central Nigeria, where agriculture is the main stay of the economy, and where women do most of the agriculture related labour, I bring into the research an interpretation that is shaped by my personal experience.

I watched how women scour through the forest and farm little plots of land using traditional methods, just to make sure their children do not go hungry. Growing up I participated in some farm work as well.

Due to my heritage as an Indigenous woman that has lived through some of the experiences of the participants, I bring certain biases to this study. My experiences may make me want to

make interpretations according to my own experiences. To avoid that, I chose a community different from my own community and I utilized certain Indigenous methodologies such as talking circle that allowed participants share their experiences within a familiar setting and in a non-structured manner. That minimized the risk of collecting data that are answers to a potentially pre-conceived line of biases or questions. Although Indigenous groups in Plateau state share some similarities in their cultures like food and teachings, each group is distinct and has unique characteristics. Even though this research is not about me or my ethnic group, I believe my experiences were an asset and not a liability to the process because it helped me understand better where those participants were coming from in terms of their realities and it helped me show respect to the people and their knowledge because I know how important that is to the Indigenous way of life.

I engaged with the community long before the study commenced, that helped in the building of relationship and trust. My willingness to learn from them, instead of being the teacher, helped me immerse more in their culture and enhanced the process.

The need to maintain good, standardized, professional and acceptable ethics while conducting a research cannot be overemphasized. Researchers are responsible for ensuring that participants are not harmed, privacy is maintained and that participants have been provided with informed consent forms (Micheal, 2001).

The following steps were taken to deal with potential ethical issues:

1. The research proposal was subjected to both the department of Indigenous Governance and The University of Winnipeg ethics review board. Ethics approval was obtained (Protocol no. HEO 5619).
2. Both verbal and written consent was obtained from all participants before interviews, pictures and talking circle were collected. The consent form, which contained

information pertaining to data storage and dissemination, research summary and researchers contact information, was read out to each participant and a hard copy was issued to each participant as well for their signature or thumbprint. A copy of the signed form was given to each participant. Since consent was ongoing, participants could withdraw their consent at any time before, during and after the field work. The only circumstance where a participant may not be able to withdraw consent is after the researcher has written and orally defended the thesis. However, participants will be aware of such proceedings including any plans to publish any part of the work.

3. Participants who wish to remain anonymous through the research process were honoured and assigned a tracking number.
4. All data collected from the study were safely locked in a filing cabinet at the university, and all digital files were secured using passwords. Besides the participants, the data was not shared with anyone except the thesis committee members.
5. Participants who did not want their pictures taken or their voices recorded were respected and notes were taken manually during their interviews.
6. No participants name was used for any quotes in the final document. However, some members of the community who wish to be identified in the study have their names mentioned as a sign of acknowledgement and respect.
7. This research was conducted with support from the community's leadership. A letter of support was obtained from community leadership before the field work commenced.

Furthermore, the following steps were taken to ensure the research adhered to ethical Indigenous protocols:

1. There was a ceremonial visit and welcoming event at the chief's palace before the work commenced. This was when the researcher went to announce her arrival

officially to the community's chief. The chief offered his blessing and good will to the researcher before work started.

2. Sufficient nutritious meals were made available to the participants through the period of the daily meetings.
3. Traditional honorarium was properly addressed in form of cash or gift equivalent of between \$15 and \$20 as suggested by community's chief and elders.
4. Efforts have been made to use the Irigwe term for the various foods identified in the study.

A draft of the study has been shared with the community; however the researcher plans to send a final copy of the study for the community to keep as their own copy. Results and summary of the study will be shared with other community members during various group meetings. Efforts would be made to make such presentations in the local language. The researcher is looking at possibilities for producing a copy of the findings in the local language, this is not finalized yet, but it is been considered.

3.7 Risks and Risk Management

Even though there was no intention of causing harm to the participants of this study, there were times when some participants felt uneasy sharing their traditional food stories and teachings, because some food teachings still remain closely guarded amongst families in the community which is common in many Indigenous communities across the country (Ehinmore & Ogunode, 2013). Such participants understood that they could only share what they felt comfortable sharing and they knew they could pull out of the study or retract their interviews at any point before, during and after the study without any repercussion. Similarly, some participants became emotional when sharing their experiences. The researcher had prepared for such risks prior to the study so such participants took breaks away from the interview and

only returned when they feel ready and comfortable. Also in a bid to minimize and manage risks relating to confidentiality, participants were educated on the importance of keeping discussions during talking circles confidential and within the circle.

CHAPTER FOUR

4.0 BACKGROUND ON THE COMMUNITY

4.1 History of Indigenous Foods and Programmes in Plateau State

Historically, the region around “Plateau state”, as it has come to be known now, practised a unique kind of subsistence farming which was characterised by the growing of Indigenous grain crops such as millet (*Eleusine coracana*), fonio (*Digitaria exilis*), sorghum (*Sorghum bicolor*) and iburu (*Digitaria iburua*). Fonio and iburu were the dominant crops (Davies, 1946). However, with British invasion in the early 1900’s came the introduction of new crops- the maize and potatoes (called Irish potatoes in the region to differentiate it from the Indigenous sweet potatoes), and gradually over the years, these introduced crops found their way into the Indigenous peoples gardens, but it was still grown at a very minimal quantity (Blench, et al, 2003).

Nigeria in the 1970’s went through a dramatic change in its agricultural sector; it went from being this giant of Africa that exports crops such as ground nuts, rubber, palm produce and cocoa, to a nation which could barely produce enough to meet up with domestic food demand (Netting, et al 1989). Suddenly, attention moved to oil exploration, there was massive rural-urban migration in search of non-farming jobs in the urban centres, and to celebrate that new found “status” the government turned to importing cheap foods into the country, to the detriment of its local food and producers (Watts, 1984, Bates, 1983). To help revive the agricultural sector, the ADP’s (Agricultural Development Programmes) were formed. These World Bank assisted programmes were designed to assist the country regain self sufficiency in agriculture and food production.

The Plateau State Agricultural Development Programme (PADP) was one of these programmes. Its mandate when formed in 1985 was among other things; to help enhance food production and provide extension services to local farmers. In its dealings with local farmers, PADP was promoting the cultivation of those introduced crops-maize and potatoes, by providing farmers with hybrid seeds, subsidized chemical fertilizer and tractor rentals (Blench, & Dendo, 2003). The PADP essentially took off on colonial structures while ignoring Indigenous crops and knowledge (Netting, 1989). Another colonial policy that was set to destroy Indigenous knowledge was the forceful movement of Indigenous people, such as the Indigenous people of Dummak, from the hill sites where they practised terrace farming and composting; to the plains where they had to revert to slash and burn to enhance food production (Rowling, 1946; Davies, 1946).

While Indigenous crops such as millet, fonio and sorghum produce residues that can be a source of nutritious food for livestock, potatoes and maize does not. Cultivating Indigenous foods was beneficial to local farmers because they could get manure from the livestock that come to feed on the residues of their plants.

Over the years, the PADP and other related projects became a shadow of themselves there by contributing little or nothing to the states Indigenous food crops. Once again, the state was back to where it started from. In 2008, the administration that newly came into power introduced the Agricultural Services and Training Centres or ASTC's. The main aim of the programme according to the then government "was to introduce principles of commercial agriculture in a rural subsistence agricultural setting through provision of comprehensive, proven and state-of-the-art agricultural services to the farming communities in Plateau State" (Plateau State Government, 2015). Farmers were supposed to access these services from any of the offices located in the three senatorial zones within the state. The government has laid out its achievements regarding the programme on its website, however, rural communities

such as Kwall, is yet to reap the dividend of this initiative. Infact, most people in the community did not know about the programme, let alone access it. The ASTC office which is supposed to serve their community is located in Vom, over 60km away from them. Now, there is a new government from a political party which is different from the previous one, it is quite early to tell whether there will be continuity or introduction of new food security policies. But judging from history, agricultural policies change with new administration (Plateau state ministry of agriculture and Rural Development, 2015). Although the current governor of the state has listed as part of his early achievements; the purchase and distribution of fertilizer through a community based approach (Will put the products in the hands of community heads in order to avoid middle men), and the commencement of payments of counter funds for the PADP food security and wheat value chain for the Fadama III project, among other things (Plateau state Government, 2015). For the many rural dwellers in the state that rely on subsistence farming for their livelihood, the hope is for history not to repeat itself.

Having examined the pattern of food security related policy initiatives in the state and the country; it is obvious that the approach has not changed much over the years. The root of the problem can be traced back to the colonial structuring of the country's agricultural sector; the idea was to promote the cultivation of "new age" crops and neglect of Indigenous species which could thrive with little input. Nigeria's ability to export cash crops prior to the oil boom of the 70's could easily be mistaken for a "food secured nation"; however, the oil boom exposed how vulnerable the structure had been all along. Since the emphasis was not so much on ensuring food security and self-sufficiency as it were, little was done to enhance subsistence farming, promote Indigenous crops and local capacity, so that they can be strong enough to survive external forces such as the ones in play at the peak of the oil boom. Processed foods were imported to satisfy the urban rich at the expense of Indigenous foods.

It is argued that the lack of funding and failed leadership are among the chief contributors of Nigeria's failed agricultural sector, however, judging from passed policies, it is clear that the government has continued to take the top-down approach, with little emphasis on Indigenous food systems and knowledge.

4.1.1 State of food security in Plateau state

Because of the lack of specific data on the state of food security on the local level in Nigeria, the National Demographic and Health Survey (NDHS) is often used by researchers (Okeke, E.C. et al, 2009; Akinyoade, A. et al, 2013) to give details such as; state specific information regarding health challenges that are related to nutritional deficiencies. Among other population and health information, the survey highlights anthropometric indices (stunting, wasting & under weight) in women and children, which is also related to the state of food security of the community.

According to the latest NDHS (2013), 36 percent of children (under 5 years) in Plateau State are stunted; stunting is a primary manifestation of malnutrition. 10.5 percent of them are wasted; wasting reflects acute malnutrition, while 20 percent of them are considered underweight; being underweight represents chronic or acute malnutrition or a combination of both (NDHS, 2013). In comparison to the other six states within the North-central zone, Plateau state has the worst record for stunting, and it barely performed above national average; which sits at 37 percent (NDHS, 2013).

While food insecurity can affect an entire community or nation, there are certain members of the community that are more vulnerable to the effects of food insecurity. Women, by virtue of their biological make-up as child bearers have an important role to play in a community's wellbeing. A woman's nutritional status has important implications for her health as well as for the health of her children. Among women, malnutrition results in reduced productivity,

increased susceptibility to infections, slow recovery from illnesses and heightened risk of adverse pregnancy outcomes like having baby with low birth weight, producing low quality breast milk, death due to postpartum haemorrhage and morbidity for both herself and her baby (NDHS, 2013:175). According to the latest UN global poverty index, Plateau state has a 51.6 percent poverty rate; this is higher than the national average of 46 percent (UN Global Multidimensional Poverty Index-Nigeria, 2015). The ten poorest states in Nigeria are in the north, with all of the northern sub-regions (north-central, north-west and north-east; 45.7 percent, 76.8 percent and 80.9 percent poverty respectively) performing poorly compared to the national average of 46 percent poverty rate (UN Global Multidimensional Poverty Index-Nigeria, 2015).

4.2 Irigwe Communities: Historical and cultural background

Historically, the Irigwe people use to live in euphorbia-enclosed extended family compounds that are clustered closely together to form a belt of almost continuous settlement running north and south for about 4 miles just above the Jos-Plateau (Sangree, 1969, Pp. 1046).

Prior to forceful British intervention in 1905, the Irigwe people practised their traditional religion and had no central leadership, each hamlet had a male head that takes charge of affairs and such roles were exclusively reserved for the men in the community. However, with colonization came the centralized system of leadership whereby a central head coordinated the affairs of the tribe and facilitated colonial agendas (Riku, 2015). Those agendas included the introduction of christianity and abandonment of the Irigwe traditional spiritual practises.

The Irigwe people traditionally gained their subsistence through farming. Farming was done with crude tools and hand hoes in the wet season, while game hunting was done in the dry season (Sangree, 1970). Hunting was done by men mostly for recreational purposes and not

really for the meat. Sangree, in his 1974 article on tribal ritual among the Irigwe, reported that the amount of meat consumed from game hunting would have amounted to less than a pound, per person, per annum. So meat based food has always been of little significance to the Irigwe Indigenous food system. Farming and wild food harvesting was how they met their food security needs. They farmed Indigenous grains such as fonio (*Digitaria excilis*) and millet (*Eleusine coracana*). Vegetables such as *Chorchorus capsularis* and *Moringa lleyfera* were sourced from the wild (PADP, 1985).

Traditionally, women were not allowed to plough the fields, a man whose wife is seen ploughing the farm is considered a weak and lazy man (Riku, G. 2015). Women engaged more in weeding of the farm, sowing, harvesting, transportation of food from the farm, processing, and sale of food. Women engaged more in vegetable farming. The women were also chiefly responsible for cooking. Wild food harvesting was done by both men and women. Women do most of the harvesting for soup ingredients and fuel wood for cooking. They also forage for tree products that serve as both food and medicine (Riku, 2015).

The Irigwe people were also known as fierce warriors because they were known to hunt the heads of their enemies and keep the skulls alongside skulls of big games in shrines in the community. They were also known to anthropologists for their distinct practice of polyandry; and since divorce was not permitted traditionally, a woman is allowed to be married to several men throughout her life time and can switch between former spouses any time she so desires (Muller, Jean-Claude. 1978).

4.3 Present-day Irigwe communities: Setting, Population and Leadership

Kwall is one of two districts in Bassa Local Government Area (LGA) of Plateau State Nigeria. Bassa, which lies 9°56'00"N 8°44'00"E is situated above the western escarpment of the Jos Plateau and covers a land mass of 1, 743 km². Figure 1.1 shows the map of Plateau state, showing Bassa LGA. Miango is the second district. Kwall has a population of 15, 620, with 7, 537 males and 8,083 females (NPC, 2006). The Irigwe people have a central paramount traditional ruler, who is HRH "Bra Ngwe"; however, smaller communities have their own local chiefs who oversee the affairs of those communities and report to the paramount ruler. Just like other Indigenous groups, the Irigwe people have traditional roles for men and women. Women in the community still carry out their traditional responsibility of home making, they are in charge of the up-keep of the home and children; however, they also contribute to duties outside of the home front. Weeding, planting, harvesting and selling of farm produce are mostly done by women. They are also responsible for processing foods like grains into usable forms. Nevertheless, these traditional gender roles and responsibilities have evolved over time because women are increasingly involved in ploughing whether for their personal farms or as workers on other peoples farms in the community. Women engage in vegetable farming for the most part, in fact, the Irigwe pepper is renowned for its "heat" all over the region. It is famously called "borkokun Miango" (Miango pepper). Vegetable gardens on door steps and back alleys are a common sight in Kwall. The people of Kwall predominantly practice their traditional religion and christianity.

The Gbeke and Fobe are two major rivers that pass through the community. Community members' source for fish from these rivers, however this activity has reduced over the years due to the damming of the Gbeke River by the Nigerian Electricity Supply Corporation (NESCO) for power generation purposes within the state. They celebrate a festival in late March or early April called the "**Zrachi**". This is a significant festival in the community

because it reflects their identity as a farming community. During the festival, they thank the deity for a good harvest and pray for a successful planting season ahead. Figures 1.2 and 1.3, shows homes and scenes from present day Kwall community.

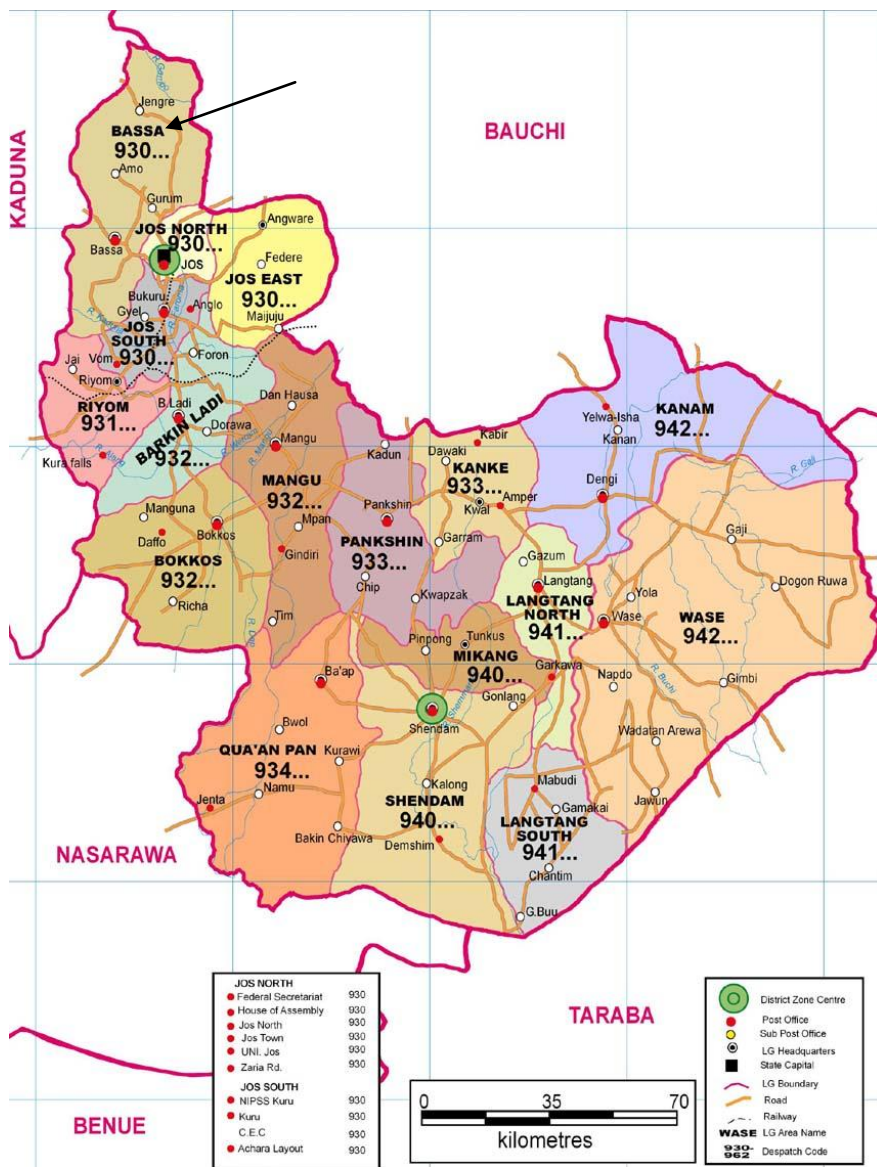


Fig 1.1 - Map of Plateau State showing Bassa Local Government Area.

(Source: Nigeriazipcodes.com, 2015).



Figure 1.2- settlements in Kwall community



Figure 1.3- Scene from Kwall community

4.4 Climate and Vegetation

Despite being located in the tropics, plateau state has a near temperate climate; with temperatures averaging between 18° C and 20° C. March and April are when the warmest weathers are recorded, while the months of December to February brings in the coldest weather. This low temperature has led to the reduction of some tropical diseases like malaria. The region is also free from tsetse fly which causes the disease trypanosomiasis in humans or nagana in animals such as cows. It has a mean annual rainfall that varies from 131.75cm in the south to 146cm on the Plateau.

The vegetation, which was formerly wooded, is now mostly open grassland used mainly for farming. It is characterised by patches of cacti and dispersed trees. The grass land in combination with a tsetse fly free zone, presents an idle grazing field for Fulani pastoralists (Blench, R.M. & Dendo, M. 2003). They use to graze their cattle in the area; however, this activity has reduced over the years due to conflicts between Indigenous farmers and the pastoralists.

4.5 Summary

The Irigwe Indigenous food system is known to have supported its people for many generations, from when game hunting was practised to its present time where farming and wild food harvesting is the predominant way by which people in the community access their food. Plant based foods have remained the dominant source of food for the community and Indigenous foods such as fonio (*Digitaria excilis*) which was cultivated in the community many years ago still remains a valuable crop for the people. However, government policies which largely got their inspiration from colonial policies promoted the production of new age crops such as Irish potatoes and maize and neglected Indigenous crops. Many Indigenous communities continued in their crop traditions, however, changing political, environmental

and economic dynamics have contributed in shaping these communities realities when it comes to access to their Indigenous food and the sustainability of their food systems. The table below summarizes changes that have occurred within the community’s Indigenous food system over three major era’s: pre-colonial (before 1861), colonial-era (1861-1960), (1960-date).

Table 1.0- summarizes changes to the Irigwe Indigenous food system

Pre-colonial (Before 1861)	Colonial-era (1861-1960)	Post-colonial (1960-date)
Extensive big game hunting, largely recreational	Reduced big game hunting	Little hunting activities, mostly smaller wild animals
Exclusive cultivation of Indigenous foods	Gradual introduction of ‘new age’ crops	Cultivation of “new age” crops alongside Indigenous crops
Extensive wild food (plant based) harvesting	Significant wild food harvesting	Wild food harvesting still practised but at a reduced rate
Traditional farming without the use of input	Farmers are beginning to be introduced to inputs such as chemical fertilizer and tractor rentals	Some degree of input use in farming, but not extensive

Activities such as big game hunting reduced during the colonial era largely due to laws imposed by the colonial government, prohibiting the people from hunting (Sangree, 1974). Most recently, security challenges in the region due to religious and sectarian conflicts has made wild food harvesting reduced significantly in the community. People no longer feel secure in the wild so they are discouraged from veering into the bushes. Other factors such as species extinction and over harvesting have also been given as reasons why wild food harvesting is not as dominant. More of these issues will be discussed in detail in the next chapter, which contains results from the study. The neglect of Indigenous food system and knowledge can be traced back to colonial policies and it still persists. In order to promote Indigenous foods and their benefits, this study is highlighting the Irigwe Indigenous food system and its challenges and potentials. This could potentially bring more attention and encourage more inclusion in policies and programmes to a region that is performing poorly in terms of food security.

CHAPTER FIVE

5.0 RESULTS AND DISCUSSIONS

5.1 Background

Results are discussed under the three objectives laid out for the study. This section will also attempt to explain the rationale behind including a discussion about “medicinal benefits of Indigenous foods” in a food security discussion. For each objective, findings from this study will be discussed first, and then discussions about the implication of such findings will be put forward. This will be supported by literatures, tables and charts. A case will be made for the role the Irigwe food system can potentially play in enhancing food security.

5.2 *“Iya Anyiri Kenji” (“Our food our medicine”): Irigwe perspective on Indigenous foods*

“If the body is not well and it cannot accept any food; the food has to come in form of medicine”. (*mama Rahab, Irigwe elder, 2015*).

Traditionally, the use of plants to cure illnesses is rooted in human history (Grabley & Thiericke, 1999). Although numerous studies have been carried out in Nigeria to highlight medicinal plants and Indigenous plants eaten for nutritional and/ or medicinal purposes (Olorunnisola, et al 2013; Sonibare, et al 2009; Ezebilo, 2010), the concept of “food as medicine” or vice-versa is an emerging field with vast opportunities for future research (Shukla, 2015). Taking a close look at most studies done on Indigenous food, the connection between food and medicine seem quite obvious, yet salient; as if to say everybody ought to get it. This kind of approach to the study of Indigenous food tends to leave behind a fundamental history, which speaks to the very existence of most Indigenous peoples because they relied on their food both for nutrition and medicine, long before the advent of modern

medicine. The WHO in its recent 2014-2023 Traditional Medicine Strategy document reiterated the importance of traditional medicine in maintaining the health of many people across the globe, and called for continues efforts to integrate it into mainstream health systems and make it safer and readily available through regulations and policies (WHO, 2013).

The Irigwe culture acknowledges the connection between food and medicine. To them, medicine is consumed each time they eat their Indigenous foods, but there are times when these foods have to be prepared in a certain way to achieve the necessarily result in order to cure some certain illnesses. One participant puts it this way:

“The truth is; everyone is a medicine man or woman. I say this because our food is our medicine so if you consume food then you are consuming medicine”

(participant 16. Field interview, August, 2015)

Results from this study reveal that, plants such as tree stems/roots/leaves, which are often used for preparing medicine, are also used in meal preparation. An example given by participants of this study is the traditional malaria medicine, which is made up of plants such as the neem (*Azadirachta indica*) and bitter leaf (*veronica amygdalina*). The bitter leaf is an important vegetable used in the preparation of soup. The Gbangri (*Grewia spp*) used for making soup is also used as medicine against high blood pressure. The catfish, which is consumed as food is also used in making medicine for cold.

In their study on medicinal plants used by the Fulani’s during drought in Northern Nigeria, Locket, et al 2000, acknowledged the concept of food as medicine and medicine as food. Examples of foods such as kuka (*Adansonia digitata. L.*), tsamiya (*Tamarindus indica*), were given as examples of food used also as medicine. This is one of few studies in the region that

explicitly stated and dedicated a portion of their write-up to highlighting the relationship between food and medicine.

The holistic approach to the way the Irigwe people embrace their health, knowledge and life is similar to that of other Indigenous peoples in other parts of the world (Absolon, 2010, Robbins, 2011). To them everything is connected, the environment, the human and the supernatural. And in order to attain balance in their daily lives, every element must be treated with respect, which is why they dedicate their harvests to the deity through the “*Zrachi*” ceremony and pray for a bountiful season ahead, and respect the environment by taking only what they need. To them, human health is a reflection of what is consumed, so if you consume good food then you end up healthy otherwise the body will fail. Their food plays a vital role in maintaining that balance among their people.

5.3 Objective 1- To identify the various Indigenous foods utilized in the community and their nutritional and medicinal benefits.

5.3.1 Background

A total of 23 Indigenous foods (I.Fs) were identified by participants; which includes:

9 vegetables, 7 tree plants, 4 grains, 1 root/tuber and 2 species of fishes. Table 1.0 shows the various I.Fs identified by participants and their uses.

Each participant was able to identify at least 5 Indigenous foods. However, on average, women had a slight edge over their male counterparts in terms of their abilities to identify Indigenous foods. Women participants identified 8 Indigenous foods on the average, while their male counterparts identified 7 on the average.

Table 2.0- summarizes various Indigenous foods within the Irigwe food system and their benefits, as identified by participants.

VEGETABLE PLANTS

IRIGWE	COMMON NAME	SCIENTIFIC	MEDICINAL VALUE	NUTRITIONAL VALUE
Riti	Bitter leaf	<i>Vernonia amygdalina</i>	Boiled and used for treatment of malaria fever, and as antioxidant.	Used in the preparation of soup. Used in preparation of local salad. Used by nursing mothers to enhance breast milk. Eaten by pregnant women to prevent anaemia.
Akwe ramah		<i>chorchorus capsularis</i>		Used in the preparation of local salad. It is believed to “cleanse the blood”. It is also used to feed livestock because it is believed to contain essential nutrients for livestock wellbeing.
Akwe zogala	Moringa	<i>Moringa oleifera</i>	Used in combination with other plants to prepare medicine	Used for the preparation of local salad. It is believed to have nutrients that help in rejuvenation and building strong

			for typhoid fever and jaundice.	immunity. Also used to feed livestock
Zhe		<i>Hibiscus sabdariffa</i>		Used for the preparation of soup. Helps to prevent anemia.
Rikkwe	African spinach	<i>Amarathus cruentus</i>	Used to feed livestock	Used in the preparation of soup. Used in the preparation of local salad.
Ayoyo	Jute	<i>Corchorus olitorius</i>		Used in the preparation of soup. Believed to contain nutrients that help maintain good vision and healthy skin.
Karkashi		<i>Corchorus spp.</i>	Used for washing hair to cure head lice.	Used in the preparation of soup. Believed to prevent and reverse anaemia.
Gauta	Garden egg	<i>Solanum aethiopicum</i>		Used for the preparation of soup and local salad. Believed to contain nutrients to help maintain good vision. Eaten as a form of food or snack

TREE PLANTS

IRIGWE	COMMON NAME	SCIENTIFIC	MEDICINAL VALUE	NUTRITIONAL VALUE
Akwe urin	African locust bean	<i>Parkia biglobosa</i>	Oil extracted from seed is used to cure ear infection.	Soaked and used as beverage. It is believed to contain healthy fat. Used in place of milk. Seed is used in making locust bean, popularly known as “dadawa”. It is a condiment added in meals and soups.
Akwe shawara	Neem tree	<i>Azadirachta indica</i>	Used in combination with other plants in the preparation of medication for yellow fever and malaria.	Used for making chewing stick, this is used for cleaning teeth because it is believed to contain nutrients that can make teeth and bones healthy, so it can be swallowed safely while in use.
Akwe oho	Mahogany	<i>Khaya senegalensis</i>	Boiled to make solution which is used to cure	

			<p>stomach ache.</p> <p>Oil extracted is used to cure pile.</p>	
Akwe tsamiya	Tamarind	<i>Tamarindus indica</i>	Seed soaked overnight and solution is used to relieve constipation	Solution is also added to gruel by breast feeding mothers, it is believed to increase breast milk.
Gbangri	Grewia mollis	<i>Grewia mollis spp</i>		<p>Back of stem is scrapped to extract fibre used in the preparation of <i>toka</i> soup.</p> <p>Soup is believed to help regulate blood pressure</p>
Akwe kuka	Baobab	<i>Adansonia digitata</i>		<p>Leaf is used for the preparation of soup, either dry or fresh</p> <p>Solution of leaf is used to neutralize alcohol effects in the body.</p> <p>Seed can be sucked raw or soaked to make beverage. Because of its white colour and sweet/sour taste, it is</p>

				used as a substitute for milk, especially for young children who may not really get the difference.
Rofro mente	Conkerberry/ native currant	<i>Carissa spinarum</i>		Fruits edible. It is believed to contain nutrients that can help prevent and heal colds and sores.
Akwe kadanya	Shea tree	<i>Vitellaria paradoxa</i>	Oil extracted from seed is used to make Shea butter which is used for medicinal purposes against skin infections, swellings and as moisturiser for skin and hair.	Fruit edible. Believed to contain healthy fat.

GRAINS

IRIGWE	COMMON NAME	SCIENTIFIC	CULTURAL VALUE	NUTRITIONAL VALUE
Nwei	Sorghum	<i>Sorghum bicolor</i>	Stalk used for building fence, roofing and making fire. Used to feed livestock.	Grains edible. It is known to be filling and useful fibre source, so it is one of the popularly consumed grain in the community

Iche	Fonio	<i>Digitaria exilis</i>	Used as a nutritious feed for livestock.	Grains edible. Used to maintain blood sugar
Ibre	Finger millet	<i>Eleusine coracana</i>		Grains edible. It is often given to children in form of gruel. It is believed to enhance healthy growth in babies and young children. It has cultural significance because it is used as part of bride price during traditional marriages. It is also used for traditional rituals during festivities. It is used to settle grudges

				between the dead and the living.
Zhu	Pearl millet	<i>Pennisetum glaucum</i>	Stalk used for building fence, roofing and making fire. Used to feed livestock.	Grains edible, believed to contain healthy fat and fibre.

ROOTS AND TUBERS

IRIGWE	COMMON NAME	SCIENTIFIC	CULTURAL VALUE	NUTRITIONAL VALUE
Ugo	Yams	<i>Dioscorea rotundata</i>	It also serves part of the bride price during traditional weddings.	It is believed to be a rich energy giving food, and it is filling.

FISH

IRIGWE	COMMON NAME	SCIENTIFIC	MEDICINAL VALUE	NUTRITIONAL VALUE
Ekeh	Tilapia	<i>Tilapia</i>	Used in combination with plants to make medicine for Jaundice.	Fish edible. Believed to be a healthy source of protein.
Hwey	African sharptooth catfish	<i>Clarias gariepinus</i>	Head used in the preparation of medicine for cold.	Fish edible. Believed to be healthy source of fat and protein.

Note: participants that provided information for the medicinal value of food do not wish for their names to be included, however, some of the participants that shared knowledge on nutritional value of food wish for their names to be acknowledged. They include: mama Rahab Taywe (F), Ladi Gboh (F), Rohu Ndo (F), Dije Abba (F), Rangu Rigga (M) and Aviah John (M).

5.3.2 How Participants Use Indigenous Foods

More than half of the participants use their food for both nutritional and medicinal purposes. A significant number of them also admitted to using Indigenous foods primarily for medicinal purposes, while a small number said they utilize Indigenous foods for either or all of those reasons, including for cultural purposes. The results are illustrated in a pie chart- figure 2.0, which shows the percentage of Indigenous food use for various purposes by participants.

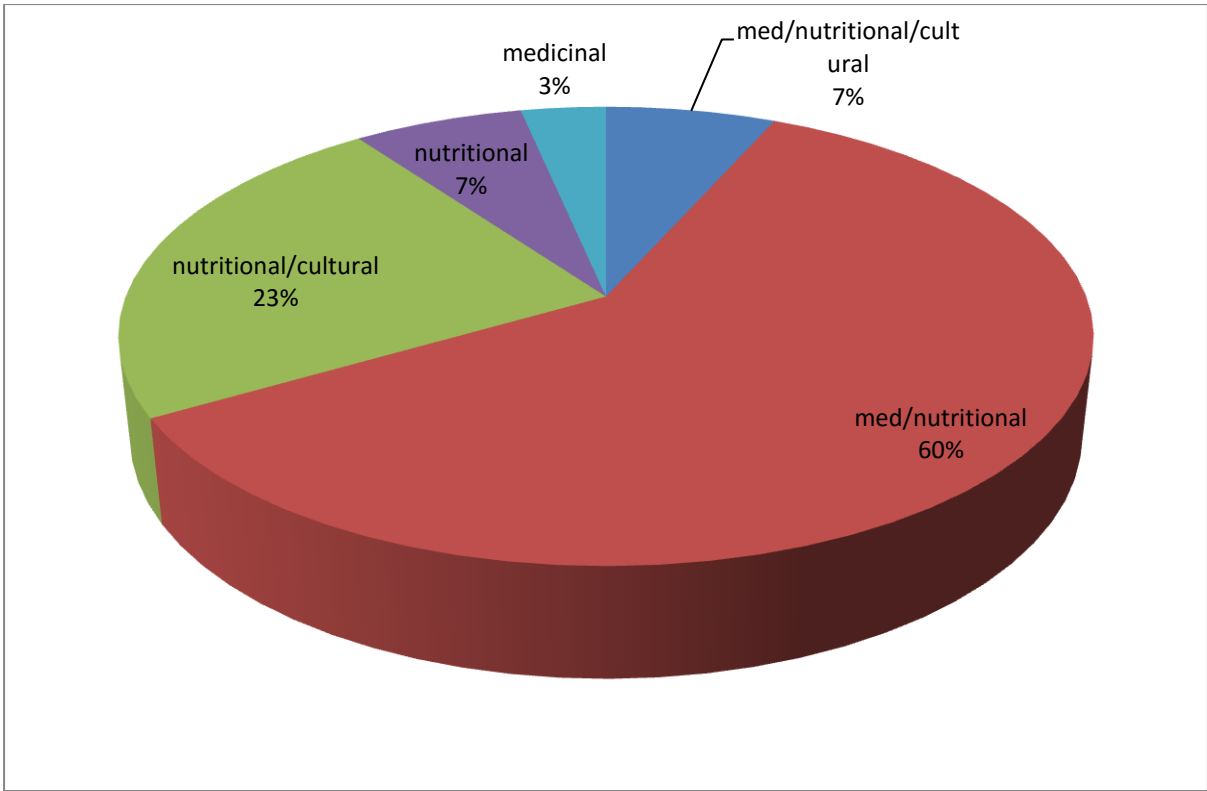


Figure 2.0- Various ways participants use Indigenous Foods.

Nigeria’s Indigenous foods have the potential to play a significant role in meeting its people’s food security needs (Effiong & Udo, 2010), (Chukwuone & Okeke, 2012), but of equal importance too is the need to identify such foods (Awodele, et al 2013). Understanding the uses of Indigenous food is essential to developing group- specific programmes and policy that will put into consideration people’s cultures and knowledge, thereby enhancing sustainable food systems and promoting health and wellbeing (Kuhnlein, 2006; Cordeiro, 2013).

The 30 participants (12 women and 18 men) in this study were able to identify 23 Indigenous foods they utilize for nutritional and medicinal purposes. Participants also mentioned that two of those foods; *Ibre* (*Eleusine coracana*) and *Ugo* (*Discorea rotundata*), are used for cultural purposes such as bride price payments during traditional weddings. Figures 2.1 and 2.2 show pictures of *ibre* and *ugo*. The reason for exploring the medicinal uses of I.Fs has been

clarified under the section (Our food, our medicine). Grains, vegetables and fruits are mostly consumed for nutritional purposes, while tree products are often used for medicinal purposes. The slight edge that women have in identifying I.Fs is no coincidence because women engage more with food on the home front, and they are usually responsible for selling excess harvests on behalf of their families. Women also knew the names of more vegetables than their male counterparts because of their involvement in vegetable production. Women are more likely to grow vegetable gardens because they are responsible for cooking. Soup is considered a basic thing that should be present at all times in the house and soups are made out of vegetables for the most part. According to one participant:

“It is the woman’s responsibility to source for soup ingredients. The one who makes the soup cannot be different from the one who sources for the ingredients”

(participant 2. Field interview, August, 2015)

Most of the other foods such as the grains are prepared into meals that are eaten with soup. One of the grains widely used in the community is *ibre* (*Eleusine coracana*), it is of great significance to the people because it is believe to help promote healthy growth among newborns and children. These are some of the things participants had to say about the significance of *ibre*:

“My mother fed me *ibre*, her mother fed her *ibre*, I fed my children *ibre* and they feed their children *ibre*. We all survived to tell the story” *(participant 28. Field interview, August,2015)*

“A meal is not a meal without our food, and a day wouldn’t go by without me eating *ibre*. It is very important to me” *(participant 29, field interview, August, 2015)*

“*ibre* is good for so many things. A mixture of *ibre*, *iche* (*Digitaria excilis*) and ginger can help cure stomach worms. I think stomach worms are the worst thing that can happen to anybody.

Why will I eat and a creature in my stomach go and take all the food”?

(Participant 16, field interview, August, 2015)



Figure 2.1- *Ugo (Dioscorea rotundata)* source-google image



Figure 2.2- A young woman holding a calabash of *ibre* (*Eleusine coracana*)

A typical grain meal can constitute *Ibre* (*Eleusine coracana*), or *iche* (*Digitaria exilis*), made into a solid paste and eaten with soup made of fresh vegetable, like the *Riti* (*Vernonia amygdalina*), or dry vegetable like *igboyi* (*Corchorus spp*). *Riti* (*Vernonia amygdalina*) is an important vegetable in the community, especially among women. This is because it is eaten by women to enhance breast milk production and they believe it helps to reduce the sugar level in the breast milk, hence the baby will most likely consume less sugar and by extension avoid complications such as pile and stomach upset which is worsened by high sugar intake. The *riti* plant is a common site in the community.

Ugo (Discorea rotundata) is one I.F often utilized because of the ease to make it into meals that can be eaten at any time of the day. It is mostly roasted and eaten with olive oil or palm oil, and it can be made into porridge with vegetable and fish. Fish is often used to garnish meals, one of the commons type of fish used among participants is *hwey (Clarias gariepinus)*, which is often sourced from the local rivers. Apart from its use as food, participants said they use it to prepare medicine for cold. Fish only serves as an additive; it is not eaten as a main dish, unlike in some societies. Besides, the population of fish in the local waters has declined over the years. Participants say is it partly due to anthropogenic activities such as the damming of the Gbeke River that use to house a healthy population of fish in the past.

Tree plants are mostly used for their medicinal value. However, some tree products such as fruits and pods are also consumed as food. An example of a tree which is of great importance to the community is the *akwe urin (Parkia biglobosa)* because of its multiple uses. The tree produces pods which contain seeds coated with solidified yellow powder. This coated powdery seeds are soaked and drunk as beverage. The seed is cooked, dried and made into locust bean- *dadawa*, it is an important condiment for cooking. Oil extracted from the seed is used as a medicine for ear infection. The seed is also used to make anti-venom for snake bites. An elder in the Kwall community testified that the *akwe urin (Parkia biglobosa)* is good from top to bottom. Figure 2.3 show a picture of *akwe urin*.

Participants also highlighted the value of the *akwe tsamiya (Tamarindus indica)*, a tree with multiple uses. Figure 2.4 shows a picture of *akwe tsamiya*. The seeds can be soaked and mixed with gruel made out of *ibre (Eleusine coracana)* or *zhu (Pennisetum glaucum)*, it is consumed as a beverage. It serves as a cheap and nutritious substitute for sugar. A solution of tamarind soaked overnight can also be drunk in the morning to relieve constipation and

enhance bowel movement. It is considered a must have for a woman in the home. Figure 2.5 shows a picture of *zhu*.

5.3.3 Seasonal Importance of Indigenous Food

Indigenous food harvested from the wild help supplement people's diet in the community especially during "hunger periods"- periods before harvest, when food supply is falling short. Because of the seasonality of most Indigenous foods, foods do not mature or ripen at the same time. This eliminates the need for long term preservation, and people just make use of what is in season. The people of Kwall have domesticated some of their foods over time, so growing them can be done year round, especially vegetable which can be gardened. Wild foods such as *akwe tsamiya (Tamarindus indica)* can be available during the dry season, even though it ripens in the raining season. This is because it can be left on the tree for up to six months to reduce its moisture. Other foods such as *rofro mente (Carissa spinarum)* are ready for harvest during the raining season months, and because of how delicate the seeds are, they are often harvested almost immediately. Birds and other wild animals such as monkeys love the seeds as well. Non-plant foods such as fish species can also be available during both the raining and dry season. The rains and river flood brings rich food sources and biodiversity for the fishes to eat so they could be abundant, but catching then could be tricky because of occasional high waters. Furthermore, the dry season makes rivers dry up, and fish could get stranded in shallow waters, thereby making them easy to catch too. Table 3.0 shows a seasonal calendar, illustrating when certain types of food are readily available.

Table 3.0- SEASONAL FOOD CALENDER

FOOD : TYPE/NAME		J	F	M	A	M	J	J	A	S	O	N	D
Irigwe	Scientific												
Grains													
Nwei	<i>Sorghum bicolor</i>										X	X	X
Zhu	<i>Pennisetum glaucum</i>										X	X	X
Iche	<i>Digitaria exilis</i>											X	X
Ibre	<i>Eleusine coracana</i>										X	X	x
Vegetables													
Riti	<i>Vernonia amygdalina</i>	X	X	X	X	X	X	X	X	X	X	X	X
Karkashi	<i>Corchorus spp</i>	X	X	X	X	X	X	X	X	X	X	X	X
Akwe rama	<i>chorchorus capsularis</i>				X	X	X	X	X	X			
Zogale	<i>Moringa oleifera</i>	X	X	X	X	X	X	X	X	X	X	X	X
Gbangri	<i>Grewia mollis</i>	X	X	X	X	X	X	X	X	X	X	X	X
Rikkwe	<i>Amarathus cruentus</i>	X	X	X	X	X	X	X	X	X	X	X	X
Ayoyo	<i>Corchorus olitorius</i>	x	x	x	x	x	x	x	x	x	x	x	x
Gauta	<i>Solanum aethiopicum</i>	x	x	x	x	x	x	x	x	x	x	x	x
Tree Plants and Tree Products													
Akwe urin	<i>Parkia biglobosa</i>			X	X	x	x	x	x				
Akwe shawara	<i>Azadirachta indica</i>	x	x	x	x	x	x	x	x	x	x	x	X
Akwe tsamiya	<i>Tamarindus indica</i>	X	x									X	X
Kuka	<i>Adansonia digitata</i>	X	X	X	X	X	X	X	X	X	X	X	X
Rofro mente	<i>Ribes nigrum</i>				x	x	x	x	x	x			
Akwe kadanya	<i>Vitellaria paradoxa</i>					x	x	x	x	x			
Akwe oho	<i>Khaya senegalensis</i>	x	x	x	x	x	x	x	x	x	x	x	x
Tubers/Roots													
Ugo	Yams/ <i>Dioscorea rotundata</i>							x	x	x			
Fish													
Ekeh	<i>Tilapia spp</i>	x	x	x	x	x	x	x	x	x	x	x	X
Hwey	<i>Clarias gariepinus</i>	x	x	x	x	x	x	x	x	x	x	x	x

5.3.4 *Summary of Findings*

The findings from this study regarding Indigenous foods and their traditional uses are consistent with past studies carried out in some parts of Northern Nigeria. A study to examine the energy and micronutrient composition of some dietary and medicinal wild plants among the rural Fulani tribe in North- Eastern Nigeria carried out by Lockett, et al 2000, reveal some similar pattern of use of Indigenous foods found in both communities. For example, the Fulani's, just like the Irigwe people, attest to using bitter leaf to enhance breast milk production among nursing mothers; and tamarind for the relieve constipation (Lockett, et al 2000).

However, there were some medicinal uses of plants reported among the Irigwe group that was not mentioned by the Fulani's in Lockett's study. An example is the use of the oil extracted from *Parkia biglobosa* to treat ear infection, which was not acknowledged as a practice among the Fulani's who use similar specie. Similarly, Lockett reported the use of the *kuka* among the Fulani's for the purpose of fattening their children; this was not reported in this study because it was not acknowledged by the Irigwe people as a practice among their people. These kinds of findings create opportunities for cross-cultural learning among Indigenous groups, thereby making it easier for such foods to be recognised and appreciated.

Studies of other Indigenous foods from the south of the country show that they contain essential nutrients and minerals. A scientific study carried out to determine the concentration of copper and zinc in *eguisi* (*Cucumeropsis mannii*), an Indigenous food consumed in form of soup, shows that it contains significant amount of those essential minerals (Onianwa, et al 2001). This finding is important because a significant amount of children in Nigeria suffer from dwarfism; which are among the symptoms of copper and zinc deficiency (NDHS, 2013).



Figure 2.3- *akwe urin (Parkia biglobosa)* source goggle images

Similarly, a scientific study that examined the nutritive value of some Indigenous foods in Akwa Ibom, southern Nigeria show that wild fruits such as the *ewanga* or white rubber vine (*Landolphia oweriensis*), *ekom* or gaboon nut (*Caula edulis*), *ekporo* or African walnut (*Conophorum tetracarpidium*), and *ubon mbakara (Attacarpus heterophylla)*, all contain high concentration of carbohydrate, crude protein, crude fat and minerals such as iron, manganese, zinc, copper, potassium and phosphorus (Effiong & Udo, 2010).

Studies carried out on the uses of Indigenous foods among the Yoruba Indigenous group in south- western Nigeria also highlighted some interesting findings. The study of the Ogbomoso people, carried out by Olorunnisola, et al (2013) shows that trees such as the neem and mahogany are used for the treatment of malaria (Olorunnisola, et al 2013). This is consistent with participants account in this study, who reported using similar species for the treatment of malaria fever and typhoid fever.

Traditionally, meat based food has been of little significance to the Irigwe diet, even when the community was engaging more in game hunting, only a little portion of their catch went for food purposes (Sangree, 1964). Fish serves as a cheaper and more accessible source of protein for the people of Kwall. The relatively high cost of meat and extinction of wild animals has made fish an even better alternative for the people. Participants say fish has always been a part of their diet, however there was once a time when bush animals such as grass cutters and antelopes serve as meat for people in the community but such animals have long disappeared. The locally sourced *ekeh* (*Tilapia spp*) is eaten as food, and is also used in combination with other foods in preparation medicine for jaundice. Figure 3.3 and 3.4 shows pictures of *ekeh* (*Tilapia spp*) and *hwey* (*Clarias gariepinus*), two fish species commonly used in the community of Kwall.

A study on the medicinal uses of Indigenous fish species in the south of Nigeria reveal that indeed fish is utilized in the preparation of medicine (Ehinmore & Ogunode, 2013). The species of fishes identified in the study by Ehinmore & Ogunode are quite different from the ones identified by the Irigwe people. Their study reported that the tail of the urandi-adiregbe (sting ray) is dried and chewed with alligator pepper by women during labour in the Ilaje coastal Yoruba community, it acts as a force or push mechanism. The fontonfonton (scuttle fish) was also identified for its healing value. The shell is grounded and mixed with palm oil and applied topically to facilitate dryness of boil. Although there are differences in fish species amongst the two groups, both group reported using fish as a remedy for various ailments. This goes to show the richness in the practices of Indigenous peoples wherever they may be habiting.



Figure 2.4 *akwe tsamiya (Tamarindus indica)*

These results show that indeed the Irigwe Indigenous people and other Indigenous peoples across the country know their food and the value of such foods. Majority of the participants (60%) say they use their food for both nutritional and medicinal purposes, while 23 percent of them use their food for both nutritional and cultural purposes. Some Indigenous group in the region, such as the *Taroh* people, are also known to use **amua'am** (a root plant in the family of Cassava), for cultural purposes such as marriages. The cultural significance of food is of note to mention in a food security discussion that concerns Indigenous people because if the issue of preferences and leading fulfilled and vibrant communities is to be met, then such issues need to be put into consideration. Food preference is one of the tenets for attaining food security (FAO, 2015). Just like the Irigwe people, Indigenous people in many parts of

the world, possess the knowledge to put their food into meaningful uses for their benefits and those of their communities. This traditional knowledge had been passed through generations, just like in the Irigwe culture were older members of the community teach younger members about traditional food knowledge during foraging trips. Indigenous knowledge like that has always been used to gain immediate and long-term access to food, even in the absence of modern technology (Mutandwa, FAO-Global Forum on Food Security and Nutrition (89) 2013).



Figure 2.5- *zhu* (*Pennisetum glaucum*)

5.4 Objective 2- To examine the challenges associated with accessing Indigenous food

5.4.1 Background

In order to establish challenges associated with accessing I.Fs, the various ways by which participants access I.Fs will be examined. Based on participants' responses, people in Kwall community access food mainly through farming and wild harvesting. Other means like purchase, exchange and sharing are also utilized. Participants also gave various responses regarding challenges they encounter in accessing I.Fs. Those responses have been categorized under categories such as: insecurity, threats to wild species, environmental challenges and challenges enhancing farming in their community.

5.4.2 Various ways participants access Indigenous food in Kwall community

Participants in Kwall community access Indigenous food through farming, wild food harvesting, sharing, exchange and purchase. Figure 2.5.1 illustrates how participants access Indigenous food.

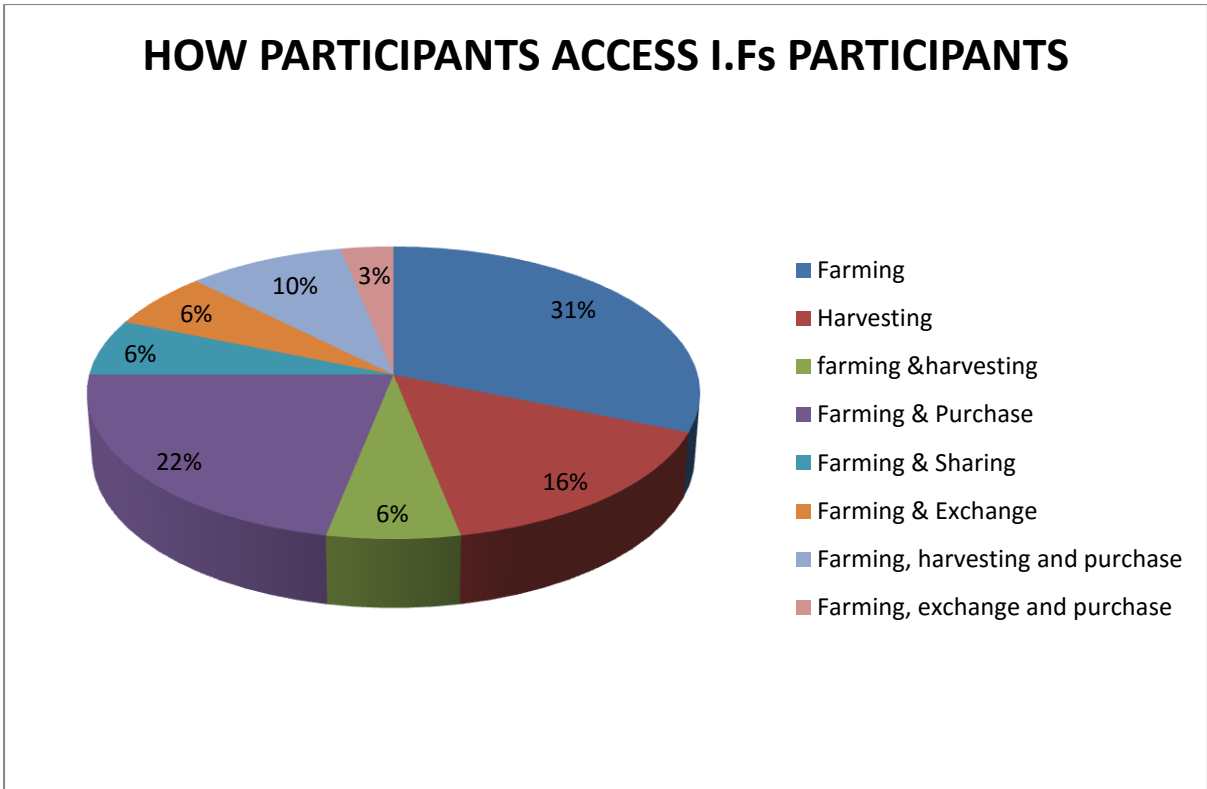


Figure 2.5.1- How participants access Indigenous Foods.

5.4.2.1 *Farming*

Traditionally, kwall is a farming community and farming is done on a subsistence level (Plateau State Government, 2015). The focus is to first feed family members, who could include extended family members or relatives, then make a living from it. People raise money from the sale of farm produce to cater for their other needs such as school fees, household products, repairs and/ or even to buy food items they do not farm.

Farming in the community is mostly done by using hoes to make ridges or dig vegetable gardens. Hoes are also used for weeding, planting and/or harvesting of foods like tubers. They depend heavily on the rain and use organic matters such as leftover food, livestock waste and/or ash from used fire wood to nourish their crops. It is the major means by which people access food and livelihood.

5.4.2.2 *Wild food harvesting*

Wild food harvesting in the community used to be done not for the sake of finding food alone, it was a form of recreation, a way that families and friends build on their relationships and learn from one another (Muller, Jean-Claude, 1978). In current times, children go to source for fruits and nuts to eat before meals are ready in their homes. Mothers used to send their children to go wild food harvesting in order to keep them engaged so that the women can take care of chores in the home. People go in groups, either age groups or gender; or as family members. Fathers take their sons to the wild to teach them how to harvest foods and source for medicine and women take advantage of such trips to talk about domestic issues among themselves, away from the men. Going in groups is highly encouraged in the community especially in recent years with the security challenges facing the region. Women are now being discouraged from going wild food harvesting without male companion and children are been watched not to go too deep into the wild. People also have to contend with wild animals such as monkeys who also want to feed from wild foods. One participant said:

“I don’t even go to the bush alone because I do not want to be attacked by a monkey or snake. They want to pick berries and wild bananas too, so it is sometimes a tussle. The bats want to feed on the fruits as well, not to mention the birds. I guess the food belongs to all of us” (*Participant 7, field interview, August, 2015*)

Foods such as Gbangri (*Grewia mollis spp*), which is an important soup plant in the community is sourced from the wild. Other significant foods such as Akwe urin (*Parkia biglobosa*) is also sourced from the wild.

Medicinal plants are mostly sourced from the wild; medicine men/women can go for months in the bushes searching for plants. The oil extracted from *akwe kadanya* (*Vitellaria paradoxa*), a tree plant sourced from the wild is used to treat skin infections and it has a fruit

which is edible. Figures 2.6 and 2.7 show *akwe kadanya* and *rofro mente* (*Carissa spinarum*), both foods are harvested from the wild.



Figure 2.6- *akwe kadanya* (*Vitellaria paradoxa*)
(Source: goggle image)



Figure 2.7- rofro mente (*Carissa spinarum*)

(Source: goggle image)

5.4.2.3 *Food sharing and exchange*

Sharing is an important value in many Indigenous cultures and the Irigwe culture is no exception. Because most people in the community have to provide food for themselves through means such as farming or wild food harvesting, people do not always have what they need. So, sharing is the way people make up for such needs. One participant in this study said:

“I farm millet and guinea corn and my brother farms yams. He is gifted with yam farming. His wife is very good with the care of the farm as well. They have a good harvest almost every year I get most of my yams from them” (*Participant 18, field interview, August, 2015*).

Growing certain types of food is a tradition that family members pass down through generations. Like this participant who said:

“I do most of my farming in the dry season because I specialize in vegetable production. This was my grandmother’s trade; it was passed to my mother and now to me”

(Participant 4, field interview, August, 2015)

Figures 2.8, 2.9, 3.0 and 3.1 are pictures of riti (*Vernonia amygdalina*), ayoyo (*Corchorus olitorius*), karkashi (*Corchorus spp*) and rikkwe (*Amarathus cruentus*). These are common vegetables used in the community.

Sharing can happen between households to assist each other out with foods they do not cultivate. In some cases it is done as exchange, so were people trade certain items for food. Firewood is a common item used in exchange for food in the community. Women engage in these types of exchanges more often because they are the once that source for firewood used for cooking. One of the women from the community said:

“There were times that I traded firewood for food. You can’t always have everything you need. Some people have too much of what they do not need but do not have the money to buy what they need” *(Participant, 23, field interview, August, 2015).*



Figure 2.8- riti (*Vernonia amygdalina*) google image



Figure 2.9- ayoyo (*Corchorus olitorius*)



Figure 3.0- *karkashi* (*Corchorus spp*)



Figure 3.1- *rikkwe* (*Amaranthus cruentus*)

Traditionally, sharing is encouraged in the Irigwe culture because of the teaching of moderation when using natural resources that belongs to all, and respect for other components of the ecosystem whom they share the resources with, i.e. the animals. People are taught to take only what they need and are encouraged to share with other community members in order to discourage greed and over harvesting.

5.4.2.4 *Buying and selling of food*

Traditionally, food was never sold in the community, people either farm, sourced, share or exchange food. However this tradition has evolved over the years and women and girls travelled miles away from the community two to three times a year to Jos and Bukuru towns to trade (Sangree, 1970). Now, selling of food is a common practice in the community. There is a community market where most of these activities take place. Items can be bought and

sold at any day in the market, however, Thursday is marked as the “market day” when people come together to exchanges greetings, buy, sell and socialise. One participant said:

“Our people never sold food in the past, but times have changed and now we sell food”

(Participant 5, field interview, August, 2015)

Figure 3.2 is a picture of grains arranged for sale in the community market.

People buy food for various reasons; it could be because they do not farm such foods or/and because they ran out of supply, among other reasons. Being that farming is the main activity in the community, people make a living from it. There is no other significant activity that people engage in to raise money in the community besides farming. For that reason money is raised through the sale of food to cater for other necessities of life such as shelter and clothing. Some parents take the extra step to send their children to school and such expenses are covered using proceeds from sale of food.



Figure 3.2- Grains arranged for sale in Kwall local market

5.4.3 Challenges Accessing Indigenous Food

20 participants expressed how challenging it is to cultivate food using traditional farming methods and hand tools such as small hoes and cutlasses, for a growing population. 6 participants expressed concerns surrounding changing environmental dynamics that affect their ability to access their food. Depleting soil nutrients and dependence on rainfall also adds to the challenge they face. So, if the rains fail or become uneven, food production is threatened. For 4 of the participants, threats to their Indigenous foods constitute a challenge to their ability to access food. Foods that use to be found close to settlements are no longer close by which means that people have to go deeper into the wild to harvest. Furthermore, 22 participants expressed concerns over the security situation in the state, which is as a result of many years of ethnic and religious conflicts that has made essential activities such as farming, a scary activity to embark on. This is due to reprisal attacks that sometimes go on in rural communities (Plateau state Government, 2015). 10 participants also expressed concerns over government neglect to infrastructural facilities and social amenities in their community which has made transporting and storage of food difficult. Figure 3.2.1 is a bar chart that illustrates challenges.

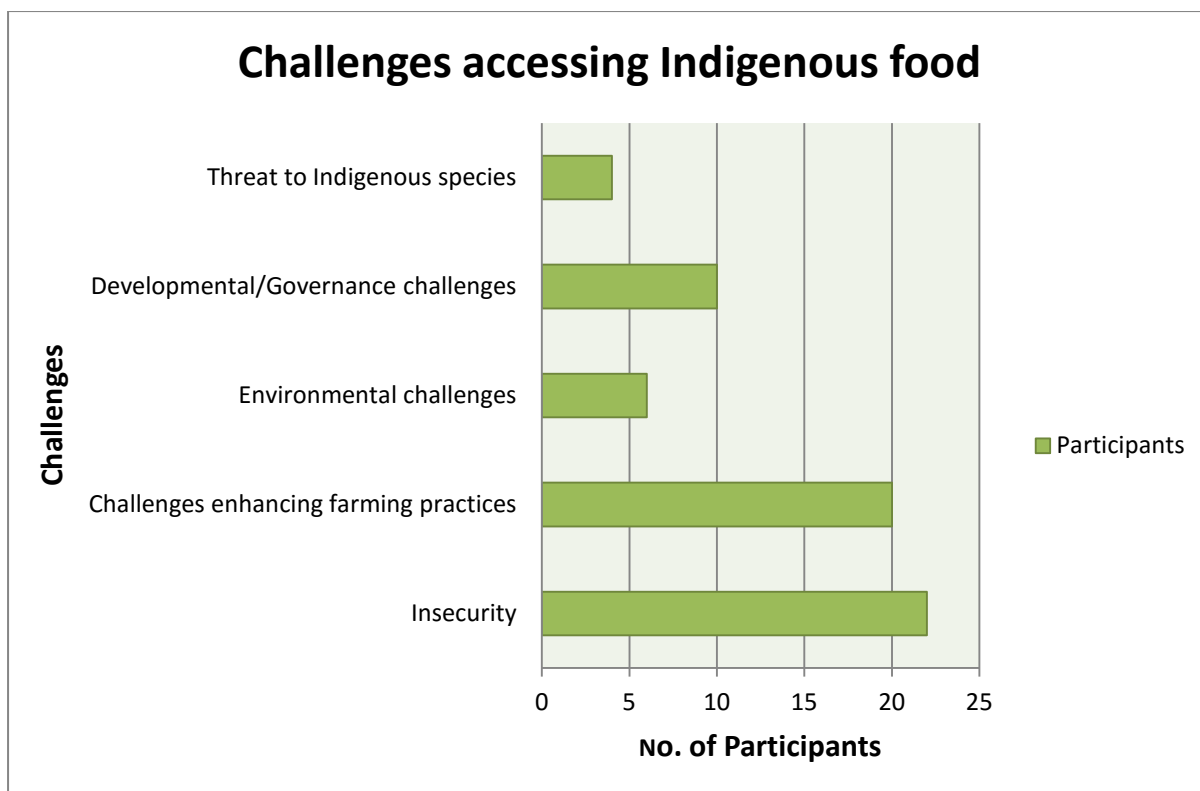


Figure 3.2.1- challenges cultivating Indigenous foods

5.4.3.1 *Human Insecurity*

Wild food harvesting has remained a valuable means by which Indigenous people in rural communities across Nigeria access their food (Chukwuone & Okeke, 2012). This is evident in this study where 5 participants reported accessing their food primarily through harvesting, while 5 others get their I.Fs through harvesting and other means. Results also show that wild food harvesting come with challenges, the biggest of which was human insecurity, where 22 of the 30 participants reported as their major challenge with wild food harvesting. The community is located in a state which has witnessed sectarian, ethnic and religious crisis, as a result many people lost their lives, farms and livelihoods (Plateau State Government, 2015). One participant expressed frustration around the security situation in the state this way:

“Let me tell you something, I wish we can have a very tall fence around our community to keep those herds men away. That is my concern. I don’t feel secured in the bush anymore.

Why should I be looking over my shoulder each time I am in the wild?

I think our leaders should provide enough grazing field for everyone to prevent such crisis. I don’t blame them for trying to feed their cattle, but must they feed on our crops”

(Participant 18. Field interview, August, 2015)

Wild food harvesting under such conditions will be challenging. Since the security challenges facing the state and the Northern region is relatively recent , not many studies have been done to highlight the connection between food insecurity and the lost of traditional food habitats that provide wild food for communities- that is an area for future research.

Farming is also affected by insecurity. Of all the sectors in states ravaged by conflict, agricultural sector is most affected (Awodola & Oboshi, 2015). With poor security situation, people do not feel safe on farmlands, so that makes them stay away from their farms. On one episode in 2010, about 400 people were killed and 18,000 displaced, during a conflict that lasted only four days in Plateau state, North central Nigeria (International Coalition for the Responsibility to Protect (ICR to P), 2015). In the same region in 2012, about 360 people were killed in ethnic based and religious crisis; most of these people are subsistence farmers in rural communities (ICR to P, 2015). The World Food Programme (WFP) predicted in 2015 that main season harvests in northern Nigeria will be significantly below average for the third consecutive year due to ethnic conflicts and human insecurity (WFP, 2015).

5.4.3.2 *Challenges with traditional farming practises (enhancing farming practices)*

Contrary to some suggestions that Indigenous people perceive modernization in general as a threat to their food system (Heslop- Harrison, 2013), responses from participants in this study

suggest that they will embrace some parts of modernization alongside their inherent traditional knowledge to build a more sustainable food system. While some aspects of modernization such as rapid expansions of infrastructures which often begins with the destruction of natural resources such as forests or excessive use of chemicals in food production is not welcomed in many cultures, technologies in agriculture production such as irrigation systems, ploughs and grain processors have helped simplified the process of food production for many rural communities around the world (IFAD, 2012). However, Africa, especially Sub-Saharan African small-holder farmers have made little or no progress in innovating sustainable ways to boost food production, therefore it is falling behind in meeting up its food security needs compared to the rest of the world (IFAD, 2012, World Bank, 2014). Little wonder therefore, that the sub-region has the highest prevalence of undernourished people in the world, 1 in 4 (FAO, 2015).

Food production in rural communities in Nigeria comes with various challenges due to the slow pace of substantial transformation in the agricultural sector (IFAD, 2012, World Bank, 2014), and Kwall is not an exception. Although farming is done on subsistence level in the community, it is important to note that it is also the means of livelihood for many in the community. This means that in some cases, it is the only means by which people raise money to take care of other essential needs. Typically, farming in the community is done using hoes to tilt the ground, but before making ridges, lands need to be cleared and prepared for the process. Some participants reported how increasingly difficult and slow this process is when the ground has not adequately absorbed water. This technique may have worked out fine in the past; however, with a rapid increase in population and more irregular climate patterns, the process is becoming more challenging. Some participants put it this way:

“Since the days of my fathers, we have used hoes to farm, now that am old, we still use hoes to farm. When will things change? There is absolutely nothing wrong in using new methods

to make life easier for people. That I use tractor to make ridges does not make me any less of a farmer, neither does it make our food any less of an Irigwe food”

(Participant 16, field interview, August, 2015)

“I get worried because a job that a tractor and one human would do in few hours, over 50 men would do in months. Is that not foolish”

(Participant 15, field interview, August, 2015)

“We hardly have problems with plant diseases, but even if I do I use local remedy like ash. Is there remedy for labour? The only remedy is equipment that will reduce the suffering”

(Participant 17, field interview, August, 2015)

Similarly, another farming practise that has constituted a challenge in attaining food security in Kwall and many rural communities across Nigeria is the lack of proper storage methods.

While people in Kwall use traditional storage and preservation methods such as smoking and storage in barns under controlled temperatures, these methods can only keep some of the foods for weeks or a few months at a time, and then it goes bad. This would have been sufficient if production was year round, but it is not because it is dependent on rainfall.

Vegetables are very difficult to manage in terms of storage, tuber food such as yams too are quite challenging. Grains are by far the foods that can be stored for at least one farming season. However, most of these grains cannot be eaten alone as a meal; they are often eaten in combination with other food items such as vegetables and tubers to make for a nutritious meal. Some participants express their concerns around storage challenges this way:

“Storage of food beyond a season can sometimes be very challenging. I have lost some yams in the past because of a storage mishap. I think the temperature in our barn was too high, so the yams became bad. It was very sad because we had a good harvest that year; imagine that happening to all our crops. It would have been devastating”

(Participant 30, field interview, August, 2015)

“It is heart breaking to see how farmers lose their produce because they cannot transport them to the market in time. Most of us use traditional storage methods. It has been working fairly for us, but won’t it be better if we can improve the way we store produce and transport them to the market” (*Participant 11, field interview, August, 2015*)

Studies carried out on the challenges of food production in rural communities across Nigeria suggests that farmers are reluctant to change their approach towards food production, so they continue to use old practices even when environmental and population dynamics have evolved over time (Enete & Amusa, 2010). All year access to food is essential to attaining food security; however dry season farming in the community comes with challenges due to the lack of irrigation systems that can channel water to farmlands. Although there are two rivers in the community, members cannot all have their farms around those water bodies, so such resource is lying untapped. Vegetable farming is often done all year round, in most cases water has to be fetched from wherever with buckets, and then applied to such plants. This kind of practice is not only time consuming and labour intensive, it is also not producing at full capacity. Women do most of the vegetable gardening, they are also responsible for grain processing, cooking and searching for fuel wood. This is how some community members expressed their concerns about dry season farming and all year access to farming:

“Yes, you know we have a river that passes through our community, but we have to use containers to fetch water for our crops during the dry season. I wish i can have a water pumping machine to pump the water upstream. It will make life easier and we can have vegetables all year round” (*Participant 1, field interview, August, 2015*)

“The greatest challenge I have as a vegetable farmer is in the dry season when I have to fetch water and feed my plants.

It would be much easier if I could get a pumping machine to channel water to my farm.

I also find it challenging accessing manure; it is expensive and often scarce”

(Participant 19, field interview, August, 2015)

Most farmers in the community use manure to enrich their crops, manure is suppose to be easier to access than chemical fertilizer. The politics surrounding the supply of fertilizer in Nigeria is enormous, the bureaucracy and the high cost of the product makes it out of reach of rural farmers (Tasie & Takeshima, 2013). However, the decline of animal husbandry in the community has made access to manure very challenging. Community members sometimes take advantage of the cow dung left behind by cattle passing through their community, but with the episodes of ethnic and religious conflicts, such movements are restricted.

Participants express their concerns this way:

“I agree that too much of that chemical is not too good for the soil, but what is the alternative, there is no manure anymore, plants need something to remind them that they can grow better. The rains are not even. We have relied on the rain for too long. I know the creator will never

fail to send the rains but we have to help the rain to help us.

I mean we have to make sure our crops are ready to take the rain once it comes.

It is like a bride waiting for her groom. She must be ready for him”

(Participant 21. Field interview, August, 2015)

“Because of problems we face with poor soil conditions and unpredictable rains, we are thinking of ways to make more manure for our crops. But decline in animal husbandry has made it difficult to meet up” *(Participant 7, field interview, August, 2015)*

For many years people in kwall community have used traditional farming techniques and relied on their Indigenous knowledge to farm their food and harvest from the wild; earlier studies showed that Irigwe people just like many other Indigenous groups in that region use small hand tools such as hoes and cutlasses to farm small lands with little or no input and

heavy reliance on rainfall (Sangree, 1974). Many years later such tools and techniques are still being used to produce food. Despite changes in climate, rainfall pattern, soil nutrient conditions, human insecurity, population and changing political dynamics, not much has changed in terms of the way these people access their food. Participants in this study expressed their dissatisfaction with the slow pace of transformation in that aspect, and while they still find their food very beneficial and their Indigenous knowledge still relevant, there is a general sense of a transformation. Participants would embrace some form of innovation that would make food production, storage, transportation and processing easier and more sustainable considering increasing pressure on their Indigenous food system from human activities and changing climatic and environmental dynamics. Indigenous foods such as *Eleusine coracana* and *Sorghum bicolor* require little or no input to grow because they are known to withstand not so ideal weather conditions; however, there are other foods such as *Corchorus olitorius* that may not be as resistant to unpleasant conditions. Participants are concerned over Indigenous wild foods that are disappearing like the *Grewia mollis* that used to be found close to settlements but is getting harder to find, and fishes that are disappearing from the waters. Certainly their realities have changed over the years and today's solutions must reflect such realities which is why this study is highlighting such changes and challenges in order to give perspective to the people's experiences which could potentially be geared towards improving the community's Indigenous food system for the good of all its members.

5.4.3.3 *Developmental/Governance related challenges*

The food security challenges facing this community are further exacerbated by the numerous developmental challenges confronting them. Kwall, just like many rural communities around the country (Kumar, et al 2014) is plagued with poor infrastructures and social amenities such as road, health facilities, portable drinking water, poor

sanitation, poor power supply and poor educational facilities. 10 participants suggested that issues like this constitute a challenge to their ability to access their food. When sanitation is poor, and people do not have access to clean drinking water, health complications can occur. If adults in a community that are suppose to engage in food production become incapacitated due to frequent ill health, food access become limited and the whole community could be affected (NDHS, 2013). Community members have had to put money together to erect a class room block because the government was not forth coming. These underlying issues make achieving food security even more challenging.

The lack of good road networks means that people find it difficult to move their produce from farm to home or market. One participant puts it this way:

“It is heart breaking to see how farmers lose their produce because they cannot transport them to the market in time. Most of us use traditional storage methods. It has been working fairly for us, but won’t it be better if we can improve the way we store produce and transport them to the market” (*Participant 11, field interview, August, 2015*).

The fact that poverty is still highest in rural communities shows that form of farming they embark on is not helping much in improving their lives. If they have to invest their earnings making up for absent infrastructure, how much will they have left to invest into practises that could enhance their production. According to a recent UN multi dimensional poverty index report for Nigeria, Plateau state is seen to have a poverty rate of 51.6 percent, performing below national average of 46.0 percent (UN, 2015).

Without the purchasing power, people are not able to access those foods they need from the market, people in the community do not always cultivate what they need so in some cases food is bought from the local market to make up for such shortfalls. People also need to buy other basics, such as clothing and purchase materials for building houses. They need to

transport goods and send their children to school, all from the meagre income they get from their farms.

“We farm and sell the produce to raise money for other needs.

I don't farm everything I need so I buy some of our local food from the market as well”

(Participant 26, field interview, August, 2015)

“We rear goats, but we end up selling them not eating them.

We rear them for years, hoping that someday we could use one for a festival. But every once in a while something comes up and we have to sell the goats to raise money for such needs”

(Participant 17, field interview, August, 2015)

The country's leadership has failed to make available an affordable energy option despite its rich natural gas endowment. In most Indigenous communities, fuel wood is the only source of cooking fuel; trees cut for such purposes are sometimes trees that are a source of food and livelihood for the community. On the one hand they are trying to meet a need-which is energy need, and at the same time their Indigenous food system is been affected negatively. Electricity, kerosene and cooking gas, which are alternative sources of energy in the country, are simply out of reach to most rural communities. This is either because they cannot afford it, or because the government has failed to make such amenities such as electricity available to all.

Agriculture is said to be an effective poverty reduction tool. According to the World Bank, for every 1 percent growth in agriculture, poverty declines by as much as 2 percent. This research highlights the traditional food system of an Indigenous community that has been in place for many generations. Although the community faces challenges in their bid to access

these foods, this study sheds light on an existing capacity that can be built upon on a community level and potentially provide lessons that could be transferred towards attaining food security and rural development on a state, national or regional level.

5.4.3.4 *Environmental challenges*

Poor soil conditions, deforestation and uneven rainfall episodes are common phrases you hear from community members when asked about challenges to accessing their food. Excessive cultivation on farmlands has made them loose their nutrients, community members complain about how difficult it is for crops to germinate on certain portions of their farms because they have been exhausted. This is how a participant puts it:

“The earth is getting tired i tell you. Last year my brother decided to plant his *ibre* on our uncle's farm because our uncle was sick, both of us planted on the same day, using the same amount of manure but his crop grew faster and better than the one i planted on my farm. I think my side of the earth is more tired than my uncle's”

(Participant 16, field interview, August, 2015)

When farmlands lose their nutrient, farmers would want to find new fields with enriched nutrients, and in most cases they turn to the bushes and forest to cut down trees in order to make room for farming.

Deforestation in the community occurs due to land clearing for agricultural purposes, and feeling down of trees for fuel wood purposes. The later is done more rapidly because in most households, fuel wood is the only source of cooking energy. They have no choice because of their economic situation, and the lack of political will by the government to provide accessible and affordable energy alternatives. The problem is the trees that are often chopped for fuel wood purposes, are trees and shrubs that produce wild foods that provide the community with nutritious food. This is a big dilemma, on the one hand the women want to

be able to cook meals for their families, and on the other hand they have no alternative so they fall back to those same trees that give them food. Kerosene, which is supposed to be a cheaper alternative, is continuously been hoarded and re-sold by middle men who take advantage of the rural poor (Lawal & Gonap, 2015).

With more people comes more pressure on the environment and its resources such as soil and water. The use of organic matters is the most common way people in Kwall nourish their crops under poor soil conditions. This typically consists of leftover food, animal waste and in some cases women use the ash from their burnt firewood on their vegetable gardens; they claim it helps to keep parasites away. Some participants said it is becoming more challenging to access organic manure due to decreased supply of cow dung and animal husbandry. Past conflicts in the state has resulted into strained relationships between ethnic groups, so the Fulani pastoralists who use to pass through the community with their herd of livestock and in the process supply the people with animal waste have reduced their activities around the state. At the height of the conflicts in the early 2000's, the grazing passage around the LGA was one of the ones blocked due to security reasons (Roger & Dendo, 2003), this means there is short supply of organic matter. Participants also agreed that they have had to make do without manure several times, however weaker soil conditions and irregular rains all impact on the overall performance of the crops and quite often harvest is not at its optimum. Some participants expressed their concerns this way:

“I have numerous challenges with food production, but the major one is manure supply. The farmlands are tired and manure will help kick start the germination. Any delay in the process means we will be behind” (*Participant 3, field interview, August, 2015*)

“I have been lucky though that my plants have never been diseased. However the problem I have with farming of our food is the absence of fertilizer. I use some organic matter to feed

my crops but I think the whole world has moved passed that state”

(Participant 21, field interview, August, 2015)

Some environmental challenges such as climate change, deforestation, over harvesting or over use of farmlands could be described as man-made. In an effort to increase farmlands trees have been cut down and with urbanization came green house gas emissions that has harmed our climate causing extreme weather conditions that cause episodes of floods, fluctuations in normal temperature levels, and irregular rainfall (UN, 2015). These types of events affect a community’s Indigenous food system, as seen in the Kwall community case. Participants attested to having difficulties enhancing soil nutrients, and dealing with irregular rainfall patterns that affect their ability to access their food. By highlighting these challenges, government would have an idea of how to redesign their policies to potentially fit these findings.

5.4.3.5 *Threats to Indigenous Species*

Threats to Nigerian Indigenous plant species come in different forms such as deforestation, over-harvesting, indiscriminate bush burning and clearing of lands for agricultural and developmental purposes (FM E, 2006).

Participants from this study discussed how species that were once found close to settlements have now disappeared, so they have to go deeper into the wild to harvest some foods. Examples include the Rofro mente (*Carissa spinarum*) and Akwe kadanya (*Vitellaria paradoxa*). One participant said:

“Some of the wild fruits we ate as children seem more difficult to get these days. I use to eat a fruit called *tiyo*, I can’t even see it anymore. I know at times you have to go deeper into the forest to get some foods because they no longer grow close to home”

(Participant 12, field interview, August, 2015)

In Kwall, just like many rural communities, cooking is done with fuel wood; the fuel wood comes from trees from within the community. Participants also acknowledged that increase in the community's population has led to settlement expansion; bushes have to be cleared to make way for new settlements. One participant explains this challenge:

“I guess it is the population increase that has led to this. Trees have been cut down to make room for homes and farmlands. We still cook with fire wood, where do you think the wood comes from?” (*Participant 12, field interview, August, 2015*)

Studies in northern and southern parts of the country show the same trend with wild food. Tree felling for fuel wood purposes has been identified as one of major threats to wild food (Idowu & Morenikeji, 2015). A study carried out in the North to highlight the potentials of wild food in enhancing people's livelihood in rural communities agreed that wild food plays significant role in the people's lives, however, plant extinction largely due to anthropogenic activities pose a threat to discovering the full potentials of such foods (Harris & Mohammed, 2003).

Community members in Kwall have made efforts to replant some trees, but the rate of harvesting seems to outweigh the efforts towards afforestation. One of the participants said:

“Most of these trees are old. I make efforts to replant whenever I can, but I cannot go from one forest to another planting trees” (*Participant 10, field interview, August, 2015*).

5.4.4 Summary of Findings

Challenges to accessing Indigenous foods in Kwall community can manifest themselves in form of insecurity, challenges enhancing farming practices, environmental challenges, developmental challenges and threats to Indigenous species. Of all these threats, insecurity is seen to be most manifesting, where 22 participants mentioned it as a hindrance to their ability

to access their food. Human insecurity in the state is largely due to ethnic and religious conflicts. Although the state has seen some relative calm, reprisal attacks in mostly rural communities has lead to deaths and destruction of livelihoods. Because most people engage in agriculture in the region, that sector is mostly hit by the situation. Farmers abandon their farms for fear of their own safety. The government have been criticised for its inability to protect lives and properties, some blame the conflict on political interests and the selfishness of the country's political elite (WFP, 2015). Other challenges with farming practises such as the use of hand tools such as small hoes and cutlasses, the heavy dependence on rain-fed farming and the lack of input, all constitute hindrances to the community's ability to access food. 20 participants agreed that such practises are not effective anymore because of the changing dynamics in population and climate change. So, there is need for better innovations if food security is to be achieved. The deplorable state of infrastructures and social amenities in the community also poses a challenge to accessing food. Poor roads networks and the lack of proper storage make it difficult to harness the full potential of foods. Foods go bad easily and farmers are sometimes forced to sell at a lost just to get rid of such produce. Furthermore, the poor state of development means people still fall back on Indigenous tree plants to provide them with cooking wood. In the process, plants that are suppose to serve as food for the people end up been cut down for fuel wood. The above mentioned challenges affect almost every aspect of their food system and livelihood, which is why, the community food system approach that this study is proposing, looks at a holistic way of meeting challenges by tapping into existing community capacity, and proffering solutions that, would impact on the entire food system and the community fabrics.

5.5 Objective 3- To generate suggestions for recommendations to strengthen food security from the Irigwe perspective.

5.5.1 Background

This is an important aspect of this study because it seeks to highlight suggestions from people who are at the centre of those challenges that led the country to its current state of food insecurity and underdevelopment, especially in the agricultural sector. The status quo to solving most challenges in Nigeria has quite too often been a top-down approach, where by rural or grass root suggestions are neglected (Philip, et al. 2009). This has led to mismatch of programmes and funding, corruption and further underdevelopment.

As stakeholders, participants of this study expressed their concerns on issues that are important to their community's food sufficiency, and gave suggestions on how to strengthen their community's food security. These suggestions are aimed at giving insights towards potentially solving the various challenges highlighted earlier in the study. Suggestions are discussed below.

5.5.2 Suggestions to address Human Insecurity

With insecurity at the top of their challenges, participants suggested for an amicable settlement of lingering grudges through dialogue amongst various interest groups; including Hausa's, Fulani pastoralists and Indigenous farming tribes on the Plateau. They feel since politicians have not been effective in their approach to settlements, traditional approaches through inter-communal peace dialogue could potentially help in bringing some relieve to the situation. Participants reminisced on how the relationship between their crops and the livestock was symbiotic- their crops get manure from livestock waste, and the livestock in

turn feed on the residues from their harvest. However, due to past conflicts, such relationship hardly exists and it seems both parties are affected. One of the participants said:

“Our people need to come together too and see what we can do for ourselves.

May be we have to help ourselves since the government is not forthcoming”

(Participant 19, field interview, August, 2015)

There are also calls for the government to ensure greater access to grazing fields for pastoralists’ and their livestock, because destruction of crops by livestock is said to be one of the causes of ethnic clashes in the state. One of the participants said:

“Why should I looking over my shoulder each time I am in the wild? I think our leaders should provide enough grazing field for everyone to prevent crisis. I don’t blame them for

trying to feed their cattle, but must they feed on our crops?”

(Participant 18, field interview, August, 2015)

Because of the multi-cultural and multi-religious nature of the country, people are sometimes divided through those religious and cultural lines and politicians take advantage of such divisiveness to use it for their political benefits. Plateau state in particular has been through years of ethnic and religious crisis that have been allegedly fuelled by politicians to serve their personal interests. Unfortunately it is farming communities like Kwall that often feel the most effect because their source of livelihood is often destroyed or forcefully had to be abandoned due to conflicts. So, if politicians and leaders will have the will to quite turning people against each other, and if the people would also recognize that they are being used, then there could potentially reach an understanding for the good of their various communities.

5.5.3 *Suggestions on improving traditional farming practices*

Participants suggested finding ways to enhance their ability to access their food production practises through dry season farming, and getting the best out of subsistence farming by simplifying the process of tilting the ground, processing grains and making richer manure that would enhance crop growth. According to one participant:

“Since we still make use of hoes to farm, you can never cover a large area at the right time before the rains come, so you have to hire labour. Hiring labour is not cheap”

(Participant 26, field interview, August, 2015)

Most farming is rain-fed with little input. Accessing fertilizer is challenging for many rural farmers because of the corruption and sharp practises involved with the process. Just like many other subsidized programmes in the country, the product hardly gets to the people that need it the most, and because offices that distribute such products are in the cities, rural farmers end up spending even more for an already costly product; that is if they do at all. Although the last minister of agriculture, before 2015, instituted some mechanism in place to decentralize the process of fertilizer distribution by placing control on the local level (FMARD, 2015). However, policy makers and administrators need to adhere to such principles for the programme to work efficiently, and so far, it has not been the case for rural communities like Kwall, where fertilizer is hard to come by.

The table below summarizes suggestions by participants on how to improve their community’s food security.

Table 4.0 – Suggestions on how to strengthen community’s food security.

Insecurity	Enhancing Farming Practices	Developmental Challenges	Environmental Challenges	Threats to Plant species
Peace dialogue among ethnic groups	More efficient farming equipments	Creation of better roads, schools, health facilities, safe drinking water and sanitation	Encourage reciprocity through tree planting	Domestication of Indigenous species to protect them from going extinct
Creating more grazing fields for pastoralists livestock keeping	Greater access to input such as manure, fertilizer, and credit	Better transportation options for movement of produce from farm to market	Encourage traditional teachings that focus on respect for the environment	Access to alternative energy to protect trees against firewood users
Greater government commitment to its citizens in terms of protection of lives and properties	Better use of natural resources such as rivers for irrigation purposes	Better access to resources that would empower community members, especially youths to encourage them to continue with	Greater access to alternative sources of energy	Effective policy implementation and enforcement to cut back on deforestation

		the community's farming tradition		
More effective natural resources' sharing formula	Greater rural development in terms of infrastructures such as storage facilities and power	Include rural people in policy decision making, especially those that affect them directly	Avoid excessive farming on a single farmland, instead practice shifting cultivation to allow soil nutrient recuperation	More government investment on Indigenous food focused research
Respect for traditional/ancestral boundaries	Better grain processing alternatives	Greater promotion of the communities Indigenous food and history; that could spur potential investors who may want to invest in the community	Encourage mixed farming, so that animal waste can serve as manure for crop production.	Encourage Indigenous teachings on environmental conservation

Irrigation farming is something that community members feel needs to be explored further to ensure year round food production that will help make their community more food secure.

Vegetable farming is essential for their nutritional health because most meals are grain based, so soups are made out of vegetables to eat such meals.

Both young and older members of the community are involved in farming, however, some older members of the community are concerned that if production practises are not simplified, youths in the community might be discouraged from farming as much as they are doing now. One of the participants puts it this way:

“Our food is already playing a vital role in our lives. We are farmers, but if we do not make the labour a bit lighter for our children, I suspect they might get tired and move to the city”

(Participant 9, field interview, August, 2015)

5.5.4 Suggestions to address developmental challenges

With the broader developmental challenges facing the community, there is increased pressure on people to solve issues arising from shelter, health, portable drinking water, cooking fuel, loss of harvest due to poor storage conditions and power shortages. One participant said:

“We need good road networks to transport our produce and to attract people to our community. We have traditional ways of storing tubers in barns and grains in bags and clay pots. But sometimes, it fails because you cannot keep some foods for too long otherwise you lose” *(Participant 9, field interview, August, 2015)*

As it is, people already face challenges with their Indigenous food system and their ability to access food, but if they have to be distracted by other issues that affect their quality of life, then their abilities to produce food and pull themselves out of poverty would be further diminished. Food security policies should take into cognisance the interconnection between these issues. Participants would like to see greater government presence in their communities through provision of basic infrastructures such as clean drinking water, proper sanitation, accessible roads, electricity and schools for their children.

Since farming is done on subsistence level, people will either have to produce more in other to get extra food to sell and generate income, or will have to sell food meant for household consumption to solve their problems. Presently, there is limited community specific statistic to quantify the state of developmental deficiencies in the community; however, Kwall's state of infrastructure deficit is a typical manifestation of what is going on in numerous rural communities across the country. There is increasing frustration on how policies and programmes are being formulated and implemented in the state. Since agriculture is the largest employing sector in the state's and the country at large (World Bank, 2015), participants expect that after all this years, the government should have gotten it right. Some participants expressed their concerns:

“I wish they can let us handle our affairs ourselves. A carpenter cannot perform surgery on a patient in the hospital; it is the duty of a doctor. I see no reason why a politician who has no clue on how maize is grown, would be in charge of inputs like manure or even tractor rentals”

(Participant 3, field interview, August, 2015)

“The government needs to be listening to people like you that come to us and ask us questions about our problems. Sometimes I wonder if the governor knows that there is a community like ours. There are many people in the world and there is no way they can sit in their offices and know what is wrong with us. Only God can do that right?”

(Participant 2, field interview, August, 2015)

In essence, the people feel that agricultural or food security policies developmental challenges cannot be treated separately in their community. This is because of how backward the community is in terms of development. One of the few habitable classrooms in the community was built by community members, with one clinic serving over 20,000 people. This is why many people in the community rely on their Indigenous food system for healthy food and medicine. Their Indigenous food system is crucial to their livelihood. All fabrics

are interconnected, so if people spend more of their resources and time contending with issues such as poor sanitation, broken educational and health facilities, diseases and unsafe drinking water, they would have less time to invest in food production.

5.5.5 *Suggestions to address environmental challenges*

While there could be solutions to poor soil conditions, rainfall is something that cannot be controlled. People have no control over when the rains will come, how long it will last or even how much rain should come. People in Kwall community depend heavily on rain-fed agriculture and all they know is that the rains are not what they use to be. The scientific explanation to these kinds of phenomenon is called “climate change”. The people have done things like changing their planting time (either earlier or later) to accommodate such changes, but there is a consensus about changing the way food production is done- from dependence on rainfall to year round production by taking advantage of irrigation farming. Participants expressed their views about solutions:

“We are grateful that we have not experienced any natural disaster lately, but as long as the world keeps going, you cannot rule out possibilities of trouble. The rains are not even, so we have had to change our planting time” (*Participant 23, field interview, August, 2015*)

“We cannot be absolutely secured by using old farming methods.

We need to be farming all year round, but we cannot do that without irrigation equipments”

(Participant 25, field interview, 2015)

Furthermore, people in Kwall have used natural by-products such as “ash” from their firewood leftovers as remedy for plant diseases and for soil enrichment.

“We hardly have problems with plant diseases, but even if I do I use local remedy like ash.

Ash is also good for soil enrichment” (*Participant 17, field interview, August, 2015*)

Typically, people use manure and other organic matters such as animal waste and left over food to enrich soil and kick-start germination especially in vegetable cultivation, but again, if any meaningful progress is to be made in terms of improving their current situation, participants feel there should be greater access to input; whether in form of enriched manure or fertilizer. As pointed out in earlier sections, fertilizer is simply out of reach for many of the people in Kwall and other rural farmers across the country due to its high cost and the corruption and bureaucracy involved in accessing the product (Tasie & Takeshima, 2013). The people feel access to fertilizer is one of the ways to enrich weak farmlands, and getting such access would probably be possible if control is decentralized. One participant said:

“I think the government should put people that know what they are doing in the agric office.

If we have one of our own there, resources will be channelled to the right people”

(Participant 22, field interview, August, 2015)

Mixed farming is also a typical sight in the community. The people possess traditional knowledge on what kinds of crops could be planted together in order to conserve and utilize soil nutrient more efficiently. Figure 3.3 shows image of mixed farming in Kwall community.



Figure 3.3- *A mixed farm in Kwall community*

5.5.6 *Suggestions for minimizing threats to Indigenous species*

Solutions under this category are mostly geared towards wild food harvesting. Participants in this study have established how significant wild food harvesting is to their food security, so they have come up with suggestions on how to prevent the total loss of such activity.

Deforestation, which affects the environment, has a far reaching effect, it entails felling of trees and most of these trees happen to be food trees. Trees are basically felled for fuel wood purposes; that are the major source of energy in the community. Nevertheless, community members feel there is still a way out, according to one participant:

“I think the solution lies in domesticating some of these wild species and promoting the teaching about our Indigenous foods in schools and government gatherings”

(Participant 10, field interview, August, 2015)

Trees are also been cut down to make way for farming. Figure 3.4 shows a farmland in Kwall community where farm trees were cut down for either fuel wood or to make more room for planting. Community members agree that replanting is also a way to curb the loss of plants. Replanting in this case does not have to be around settlements, but in the wild. One of the participants said:

“Most of these trees are old. I make efforts to replant whenever I can, but I cannot go from one forest to another planting trees” *(Participant 10, field interview, August, 2015)*

If there were affordable energy alternatives, the people would rather save their food trees and use those alternatives.



Figure 3.4- An Ibre (*Eleusine coracana*) farm in Kwall community (*Trees are often cut down to make room for farmland expansion and for fuel wood purposes*).

5.5.7 *Greater youth engagement*

Although this was not highlighted as a challenge because participants feel it is not an immediate threat to their Indigenous food system, participants feel there should be greater youth engagement in the governance of their community and there should be more teachings passed down to the younger members because they are the future custodians of the Irigwe tradition.

5.5.8 **Summary of Findings**

People in Kwall have been using their food for many years and they have mastered the art of accessing their food through generations. Sometimes accessing food is done under difficult

conditions, but the fact that they still do it goes to show how resilient and knowledgeable they are. Knowledge, in this case is their Indigenous knowledge which has helped them navigate uneven rainfall episodes, poor soil conditions, insecurity, poor rural infrastructures and unsafe drinking water. Participants gave examples of Indigenous practises that they have used to help them cope with accessing their food. They use ash from their fuel wood to help prevent pest and enhance soil nutrients, and they use leftover food with animal waste as manure. They mentioned practising mixed cropping as well and even adjusting their planting time to cope with environmental conditions that they cannot change. While these people have survived through these times, it is clear that more needs to be done in terms of investing in rural development and accesses to input, education, financing and collaboration, in order to achieve a sustainable result. Collaboration means, both Indigenous and mainstream solutions can be brought together to solve these challenges. The community food security framework encourages tapping into available resources and existing capacity, it involves all facets of a community's food system working together for the greater good of all community members and a more vibrant and healthy community.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Specific Conclusions and Implications for Irigwe Indigenous Food System and Food Security

This study set out to achieve three specific objectives; to explore the Irigwe Indigenous food system and its implication for the community's food security and health needs, the challenges that the people face with their Indigenous food system in terms of their ability to access food, and to draw suggestions and recommendations from participants on how to strengthen their community's food security. Based on findings from the study, it was established that the Irigwe Indigenous food system is endowed with foods that have both nutritional and medicinal value which contributes to the people's food security needs, health related needs and livelihood. Examples include Nwei (*Pennisetum glaucum*) used to make baby food and local beverage and is said to contain healthy fat and fibre; Karkashi (*Corchorus spp.*) is an Indigenous vegetable that is used to make soup and is believed to reverse anaemia.

Information on the benefits of foods highlighted in the findings was based on Indigenous or traditional Irigwe knowledge that has been practised and passed down through many generations. This specific finding is relevant because rural communities in Nigeria like Kwall community are worst hit by malnutrition, diseases and food insecurity (NDHS, 2013). This is despite being responsible for most of the locally produced food in the country. In Plateau state, 36 percent of children under the age of 5 years are stunted, 10.5 percent of them are wasted and 20 percent of them are considered underweight; all these indices are a primary manifestation of chronic or acute malnutrition, or a combination of both (NDHS, 2013). This study could potentially provide insights for community specific food security programmes that would take into consideration Indigenous food systems within the state and what they

have to offer. Government and non-governmental interventions during food crisis come in form of food aids, sometimes imported food. This finding has highlighted the nutritional benefits of Indigenous foods, foods that are readily available, that could potentially be used for such purposes instead of importing food.

In order to take advantage of the benefits that Indigenous foods have to offer, the people should be able to access it. However, this study has shown that accessing these foods can come with various challenges ranging from environmental challenges, to human insecurity, and developmental challenges. Threats to species that make up the Irigwe Indigenous food system also poses a challenge to how much they are able to get from it. Since farming is done on a subsistence level, often relying on traditional methods with heavy dependence on rainfall; changes in environmental and climatic dynamics affects food production. When rain pattern changes food production is affected because that is almost all they rely on. There is minimal to dry season farming. Often, dry season farming is done in form of vegetable gardens. Periods before harvests can be especially difficult because food supply is low. Pressure on farm lands also results in to loss of soil nutrients, and because farming is done with minimal input, sometimes meeting up with the seasons is challenging for community members. Wild food, which would have normally augmented food supply in difficult times, is out of reach for many people of human insecurity due to episodes of conflict and reprisal attacks in rural communities across the state (Plateau state Government, 2015). Food production is done the same way from decade's back, despite changing population dynamics and environmental challenges. This is challenging for a community that relies on its Indigenous food system for food, medicine and livelihood. The absence of basic infrastructures and social amenities like clean drinking water, sanitation, health facilities, educational facilities, roads and electricity, all form distractions and adds to the burden of food production and access. In the midst of all the above mentioned challenges, people in

kwall community still practise resilience and adaptation strategies in order to provide for their families. By highlighting these challenges, this study is giving perspective to the peoples experiences and realities and it is also acknowledging that there are opportunities that could potentially be built upon, if those challenges are resolved.

This study also highlighted participants suggestions on how they would want to see their community's food security improved. This objective is important because failed food security programmes in Nigeria have been blamed on factors such as poor grassroots involvement; especially since those types of programmes are geared towards rural people (Enete & Amusa, 2010). If policies are formulated and implemented centrally, chances are, interventions would hardly represent realities of beneficiaries of such policies. The people of Kwall suggested solutions such as improving traditional farming methods inform of increased access to more efficient farming equipments, storage equipments and food processing methods. This they say would reduce wastage and help them stay food secure for longer. People of Kwall would also like to see more government commitment in terms of providing their community with clean drinking water, good roads to transport their produce, electricity to help power processing and storage and schools for their children. They recognise that young members of their community would be the elders of tomorrow, so they are committed to investing in them in terms of education and greater engagement in decision making. The people of kwall know how important their Indigenous food system is to their food security, they have relied on it for many years, however, they also recognize that changes, both manmade and natural have impacted on their Indigenous food system and so there is need for deliberate actions in order for them to keep reaping those benefits. Engaging with communities could give an opportunity for these kinds of findings to potentially be incorporated into policies.

6.2 *Implications for Nigeria's food security*

Nigeria's current food security situation has been blamed on its policy (World Bank, 2014). The approach, formulation and implementation of such policies have been described as been too centralized, with little or no consideration for small holder farmers and rural dwellers, for which the programmes are created for.

Numerous agricultural or food security policies have been formulated in the past (like the National FADAMA Projects and the National Special Programme on Food Security that were discussed in more details under the literature review section) but studies have shown that for the most part, these policies or programmes were not able to successfully achieve their mandate. This has translated in many years of investment, with no tangible return on such investments. If over 65 percent of Nigerians are considered food insecure, and more than 80 percent of its rural population live below the poverty line, it is obvious that the approach to achieving food sufficiency and rural development has not been sustainable.

Nigeria has subsequently resolved into food importation to feed its growing population, this would have been ok except that it relays on oil revenue to solve virtually all of its problems. It has become a consumption economy with an underdeveloped agricultural and manufacturing sector. Any fall in oil prices often lead to hardship for the people of Nigeria because the whole economy is affected, and food is one of the badly hit commodities. This can be seen on the effect that the recent oil price drop is having on the country's food prices. For example, a 50kg bag of rice went from N9,500 (US\$47.70) some 6 months ago, to about N20,000 (US\$100.43) currently (Maria, 2016). Countries engage in food importation or exportation for several reasons, it could be for trade/foreign policy relationships, or because a country is going through some temporary shortages in such commodities, or because it produced enough and simply wants to export to generate income. Some have geographical

challenges, like desert vegetations, where food production is challenges and so they have to import food. However, in the case of Nigeria, it has a favourable climate for food production, it has the man-power in terms of its population, and it houses some rich species of Indigenous species, some of which are endemic (Collins & Ertel, 2008). Nigeria's decision to resort to food importation is hardly for any of those reasons; it is most likely because it has no choice but to import. Its leaders lack the political will to get things straight.

The role that the colonial legacy had to play with the direction the country took post-independence cannot be ignored. With the colonial government, the emphasis was not on attaining national food security, but on the production of cash crops mainly for exportation (PSMARD, 2015). Although subsequent Indigenous regimes tried to incorporate food security into the country's agricultural policies, they continued in the colonial structures which focused power and decision making centrally, and ignored local structures including Indigenous knowledge and Indigenous food. The oil boom of the 70's finally fuelled an already volatile situation, there was little investment in the agricultural sector, infrastructures gradually decayed and oil exploration became the focal point of the country.

Weak enforcements of forest policies have resulted into indiscriminate felling of trees, especially for commercial and fuel wood purposes. Majority of Nigeria's rural population rely on fuel wood as their main source of cooking fuel (FME, 2006). Unfortunately, most of the trees harvested are trees that serve as food and medicine for many Indigenous communities across the country (Philip, et al 2014). People also cut down trees to make room for crop production, and sometimes it is the government that destroy forests to make room for projects such as oil pipe layering in the south-south of Nigeria which has lead to the destruction of the regions rich biodiversity (Kadafa, 2012).

Ethnic, religious and political conflicts that have rocked some Northern states in the country recently has rendered many communities food insecure (WFP, 2015). Many lives and farms were destroyed and people no longer feel safe to go wild food harvesting- an activity that has assisted many people in periods when harvests are not ready. Plateau state (the research site) is one of the states in north-central Nigeria. It has gone through many years of conflicts which further exacerbated the food security situation in the region. In the absence of data to quantify the level of food insecurity on the local level, data from surveys such as the National Demographic and Health Survey-NDHS, gives an idea of some nutritional related health indices on the local level in Nigeria. According to the most current NDHS, Plateau state has the highest rate of stunting among children (36%) in the north-central region (NDHS, 2013). Stunting represents the long-term effects of malnutrition in a population. Northern Nigeria is said to be more food insecure and underdeveloped compared to the rest of the country (World Bank, 2015), unfortunately, it is the region more hit by the resultant effects of insecurity.

The food security concept that this study adopted promotes the all time access to safe and nutritious food for all. It recognises that people could have social and economic barriers to their ability to access food and that people do have cultural preferences when it comes to their choice for food. It talks about “access”; access could be through farming, harvesting, purchase, exchange or sharing. Its flexibility means that vulnerable populations such as Indigenous people, and low income people can give their own interpretation and meaning to the concept according to their preferences and realities. Similarly, the community food security framework that shapes this discussion takes into consideration a community’s entire food system. It harnesses existing capacities, and strengths of a community to make food available for “all members”. This is important because sometimes events such as natural disasters, economic situations and security challenges could make people go from being food secure, to food insecure within a short time. Periods between planting and harvest can be

quite challenging for many rural communities too, this is when stored food are falling short. It is referred to as the “hunger period”. Studies have shown that wild food, have served important roles during such periods (Lockett, et al 2000).

The developmental challenges that the country faces, especially its rural communities make accessing food even more challenging. Nigeria’s rural communities, where more than 90 percent of the food cultivated in the country comes from is plagued by poor roads, health facilities, unsafe drinking water, poor educational structures, poor sanitation and diseases (IFAD, 2012). When a population is not healthy, its adults who are suppose to be responsible for the development of the community through activities such as farming and construction become burdened with health related issues that they invest little no time to other activities (NDHS, 2013). When there is not enough food for women in the community, breast feeding babies become affected because they are poorly fed through their mothers nutrition, mothers give birth to unhealthy babies and these are the people that are suppose to grow up and take over the affairs of the community.

Food security has a far-reaching effect on a community and even a nation. It goes beyond just the absence of food. It is argued that a country that cannot feed its own is not fit to occupy a place of pride in the community of nations (Ottah, 2013). Advancing agriculture-led growth helps rural farmers who are the majority of the world’s food insecure population to grow more food and sell their products to generate incomes that would assist them meet their other needs therefore allowing them to pull themselves out of poverty (Nwokeabia, 2003).

Nigeria has copious Indigenous food that can potentially help in solving the country’s food security challenge. This study has attempted to highlight such existing resources and some of the challenges associated with accessing such food. It has also highlighted the voices of the people who are at the centre of it all- rural people. The solution is right there, it just needs to

be developed. These people have managed to feed their families and still provide for the country some food; it would only get better if more can be invested in rural communities and on subsistence farmers. The people have expressed that they would need to change their approach to food production in terms of equipments and input usage. More innovative and sustainable ways are needed for a better result. Better storage facilities, more efficient and less labour intensive ways to process food such as grains, and better roads to transport such produce to markets. There are many mouths to feed, and it would only get worse because the county's population is said to more than double by midcentury (UN, 2015). Besides, many neighbouring countries such as Niger and Chad depend on Nigeria for their food.

The central role that Indigenous foods can potentially play in household, community and global food security cannot be over- emphasised (Cordeiro, 2013; Salgotra, & Gupta, 2016). Globally, farmers in Indigenous and local communities have used their traditional knowledge to ensure food and livelihood security in sometimes harsh and fragile ecosystems (FAO, 2009). However, preserving Indigenous species come with other benefits as well. Numerous modern day innovations, such as those in the pharmaceutical industry rely on plant genetic resources to sustain their activities; there is a need to protect biodiversity because losing it comes with aggravating effects such as losing plant genetic resources and traditional knowledge (Salgotra & Gupta, 2016).

As the impact of climate change continues to manifest in people's everyday lives, developing countries from Africa, to Asia to South- America, continue to feel the effect in form of environmental disasters such as flooding and drought episodes which impacts tremendously on food security (World Bank, 2016). Studies have shown how people in the drought prone parts of Northern Nigeria rely on Indigenous foods to meet their food security needs (Harris & Salisu, 2003, Lockett, et al 2000). For where introduced or exotic species find challenging to survive, Indigenous species thrive (Onyango, et al 2009). Small holder farmers in

Indigenous communities across Nigeria have come up with adaptation strategies such as mixed farming, and alteration of planting dates to cope with climate change realities and maintain some level of food security (Borokini, et al 2014). Such knowledge can be tapped into by policy makers to develop programmes that can translate into a more meaningful path towards sustainable development.

An effective food security policy is one that does not sacrifice its Indigenous food system, but harnesses such existing capacity, in combination with increased productivity in agriculture, greater policy predictability, and general openness to trade.

6.3 *Recommendations and Programme Priorities*

1. Indigenous representatives should form part of local and national consultations leading up to a food security policy. Getting groups involved in the planning process means that their contributions and concerns can be incorporated into laws and/or policy documents.

2. Implementation of programmes or distribution of government incentives to farmers is usually done through government departments and their officers. Quite often, there is a mismatch in prioritizing some interventions for small holder farmers and rural communities. Most of the decision makers are often out of touch with the realities of these farmers. Having small holder farmers, Indigenous leaders and rural women represented in the leadership circle of such organizations or programmes will make for a more meaningful implementation. Since they are the ones that live the experience, they will have a better sense of what is needed.

3. Participants from this study raised concerns about the bureaucracy involved when accessing farm incentives. Such barriers give room for illegal activities by middle men such as hoarding and re sale of supplies at very high cost which makes it often impossible for small holder farmers to access. Such bottle necks should be eliminated by the Government by

setting up a transparent system that will decentralize the provision of such services. That way it can reach the grass root.

4. The consumption of Indigenous food should be encouraged among expecting mothers during pre- natal programmes, especially in the urban areas where there is easy access to process and secondary sourced foods. This way they can incorporate such foods in their children's diets. Schools and organisations that run lunch programmes for children should be encouraged to incorporate Indigenous foods in their menu.

5. There has to be sincere efforts by policy makers to revamp the agricultural sector in the country, through research and workable innovations that will harness existing potentials. The over dependence on rainfall due to the lack of investment in irrigation farming is hurting the country's food security status. Making farming less tedious and more rewarding through the provision of loans, manure, and proper storage options to small holder farmers will reduce hardship on these people and will make farming more attractive to younger people and potentially reduce the high volume of rural-urban migration in the country.

6. Government can promote the use of Indigenous food by investing in secondary institutions and research institutions that through research can come up with innovative options on how to make Indigenous food available in different forms.

7. Indigenous communities can be supported by Government and well meaning organizations to create local seed banks were Indigenous species, especially the endangered ones can be stored for the future generations.

8. Indigenous communities and the mainstream pharmaceutical companies can work together to find ways of making traditional medicines more accessible to the general public in form of

tablets or supplements. This can be done in a respectful way without taking advantage of Indigenous peoples and their knowledge.

9. Security is essential for wild food sourcing. It is a Government's responsibility to secure its citizens. A secure community encourages healthy and vibrant lifestyle.

10. Reducing rural poverty is essential to attaining food secure communities. People in rural areas still cut down trees to make fire for cooking meals; this action exerts pressure on the already depleting environmental resources. The increase in population further makes the situation dire. Investing in infrastructures and social amenities will improve people living conditions and help them make better choices that will cause less harm to the environment.



Figure 3.5 *ekeh* (*Tilapia spp*) goggle image



Figure 3.6 *hwey* (*Clarias gariepinus*)

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INTERVIEW QUESTION STRUCTURE

Interview and Talking Circle Questionnaires

Topic- INDIGENOUS FOOD SYSTEMS: A VIABLE ALTERNATIVE TO FOOD SECURITY.

A CASE STUDY OF THE IRIGWE PEOPLE OF KWALL, IN BASSA LOCAL GOVERNMENT AREA OF PLATEAU STATE, NIGERIA.

Purpose- The purpose of this study is to explore the Indigenous food systems of the Irigwe people of Kwall, and its potential for enhancing community food security.

Objective 1: To identify the various Indigenous foods utilized in the community and their nutritional and medicinal values, from an Indigenous perspective

1. Can you enlist the indigenous foods you utilize?
2. Can you share the uses of those foods mentioned in (1) above
3. Can you identify the types of foods that are consumed at various seasons and why?

Objective 2: To explore the challenges associated with accessing Indigenous foods by Kwall community

1. How are you able to access the indigenous foods you utilize?
2. What kind of challenges do you encounter with accessing indigenous food?

Objective 3: To generate suggestions for recommendations to strengthen food security from the Irigwe perspective.

1. What would you like to see in terms of solution to the challenges you mentioned?
2. Do you have any suggestions on how your community's food security can be strengthened?
3. Do you have any questions or concerns?



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CONSENT FORM

We invite you to participate in a research study conducted by Majing Oloko of the Indigenous Studies Department of The University of Winnipeg, who may be reached at 2049902342. The study will investigate Irigwe Indigenous food system and its potentials for community food security in Kwall community, Bassa LGA, Plateau state, Nigeria.

Participants will engage in an interview session and talking circle discussion. The field work is estimated to last for nine weeks, from the selection of participants, to data collection and data verification with the participants.

While the risk associated with participating in this study is minimal, there is a chance that some participants might get emotional when recollecting stories about their traditional foods and culture. Such participants can take a break away from the interview. Culturally acceptable and/ or professional help will be arranged for participants that need further help to deal with their discomfort.

No participants name will be linked to any interview in the final study, and participants who wish to remain anonymous throughout the study will be assigned an identity code. With their permission, participants who wish for their names to appear in the study will be acknowledged as a sign of respect for sharing their knowledge.

Data will be kept securely for 5years post thesis, after which it will be shredded.

If you have any concerns about the way this study is conducted, you may contact the University Human Research Ethics Board at 204-786-9058 or by email at ethics@uwinnipeg.ca. Please note that your participation is voluntary and you may refuse to answer any question(s) and are free to stop participating in the study any time prior to the final thesis writing and oral defense, without consequence. If you have any questions about the research and/or wish to receive a summary of the study's results please contact Majing Oloko on 2049902342.

Please check one: _____ I **do** agree to participate in the study described above.
_____ I **do not** agree to participate in the study described above

Do you want your name included in the thesis and/or other research reports? Yes/ No

Would you want your picture taken and used for the purpose of this thesis and/or other reports?

Yes/No

Would you want to receive a copy of your interview transcript and/or photos? Yes/ No

Name (please print): _____

Participant number (to be assigned by researcher for those who do not wish for their names to be used in the research): _____

Signature: _____ Date: _____

Principal Investigator's Signature: _____ Date: _____

A copy of this consent form will be provided to you. Thank you for your participation.



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RESEARCH AND INNOVATION

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**University Human Research Ethics Board
(UHREB)**

Statement of Ethics Vetting

The following ethics proposal has been approved by the UHREB. The approval is **valid for one year** from the date stated below.

For research lasting longer than one year, it is the responsibility of the researcher to obtain Protocol Renewal. Renewal may be granted for **one year only**, after such time a new protocol must be submitted. Any changes made to the protocol should be reported to the Program Officer for UHREB review prior to implementation. See *UHREB Policies and Procedures* for more details.

Name of Investigator(s): Majing Oloko	Faculty: Graduate Studies
Faculty Supervisor Dr. Shailesh Shukla	
Co-investigator(s):	
Title of Project: INDIGENOUS FOOD: A VIABLE ALTERNATIVE TO FOOD SECURITY. A Study of the Irigwe People of Kwall, Plateau State, Nigeria.	
Research Office File #: HE05619	Date of Approval: August 4, 2015
Authorizing Signature: Heather Mowat Program Officer, Research Implementation, Ethics and Contracts Office of the Associate Vice-President, Research and Innovation Telephone: (204) 786-9058 E-mail: h.mowat@uwinnipeg.ca	

