AGRICULTURAL COMMUNICATION AND EMPOWERMENT:

A STUDY OF MORINGA CULTIVATION AND UTILISATION IN SELECTED LGAs IN EKITI STATE

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OCTOBER, 2016

DECLARATION

I hereby declare that, this dissertation is my original work, and was written by me in its entirety and has never been submitted in any previous application for a higher degree. All quotations are indicated and the sources of information are suitably acknowledged by means of reference.

……. ……..

ADEBISI, Olugbenga Adebayo **Date**

CERTIFICATION

This is to certify that this dissertation, entitled; "Agricultural Communication and Empowerment: A study of Moringa Cultivation and Utilisation in Selected LGAs in Ekiti State" written by **ADEBISI, Olugbenga Adebayo (P13ARTP8016)** meets the requirements for the award of Master of Arts Degree in Development Communication from Ahmadu Bello University, Zaria and is approved for its contribution to knowledge.

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DEDICATION

To the wonderful blessings of God in my life; ARINOLA, OLAMIDE, IYANUOLUWA and the unfolding PROMISE, their presence, perseverance, hope and unequal support made this work a success story.

And

My Grandmother, Madam Bolarinwa Victoria Adurosakin (1910-2016) who nurtured me to adulthood and gave meanings to my life.

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ABSTRACT

Ekiti state, despite being endowed with abundant human and natural resources, is still one of the poorest states in Nigeria. Though poverty, unemployment and climate change are global phenomena, these are prevailing issues that call for attention in Ekiti State. The study aimed at improving the communication channels and tools used in informing the people of the study area on how to cultivate and utilise Moringa plant, which has potentials of empowering the population of the two selected local government areas of Ekiti State. Both qualitative and quantitative methods were used to elicit information from Ikole and Gboyin LGAs. The demographic data of the 188 respondents reveal an average age of 33yrs implying youthfulness and productivity. The mean value of 4.1 for years of awareness from the two LGAs indicated that majority have known about Moringa just within 4 years. From the data, 92% of the respondents agreed that Moringa has unprecedented potentials to empower people of the study area. The respondents however showed concern that actualisation of Moringa potentials is being threatened by such factors as security, awareness, land and market availability, capital, government support and illiteracy. They agreed that awareness is a major problem that needs to be addressed. They see the need to involve all stakeholders in implementation processes and information dissemination about Moringa. The findings presented promising potentials for Moringa cultivation and utilisation in the study area if proper information dissemination is available. The respondents also adduced to the need for convergence of both indigenous communication and the conventional tools of communication. The need for proactive use of various tools of communication, and people's interest and readiness to participate were identified as necessary by majority of the respondents. It is thus recommended that effective orientation and awareness creation should be provided. Synergising conventional communication channels with traditional modes of communication available will create enabling atmosphere for localisation of Moringa information drive, which can result in active local participation and eventual empowerment of the population.

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ABBREVIATIONS

ADF	Acid detergent fibre
AGADA	Alternative Action for African Development
AKIS	Agricultural Knowledge and Information System
CCTA	Communications for Technology Transfer in Agriculture Project
CLUSA	Cooperative League of the USA
CWS	Church World Service
FAO	Food and Agriculture Organization of the United Nations
FFS	Farmer field schools
FSRE	Farming systems research and extension
GC	Group Communication
ICT	Information and Communication Technology
IFAD	International Fund for Agricultural Development
IKS	Indigenous Knowledge Systems
LEISA	Low External Input for Sustainable Agriculture
NAADS	National Agricultural Advisory Services
NALEP	National Agricultural and Livestock Extension Programme
NDF	Neutral detergent fibre
NGO_S	Non-Governmental Organisations
NCBA	National Cooperative Business Association
NRC	National Research Council
SG2000	Sasakawa-Global 2000
T&V	Training and Visit
UNDP	United Nations Development Programme

WCA	World	Communication	Association

CHAPTER 1

INTRODUCTION

1.1 Background to the Study

Before the discovery of oil (petroleum) at commercial quantity in 1956, the Nigerian economy was almost entirely dependent on agriculture for many years. Agriculture was the mainstay of the Nigerian economy with enterprise such as cocoa, groundnut, oil palm and cotton production which accounted for a large chunk of foreign exchange earnings for Nigeria, thereby showing the important role agriculture had played in the history and development of Nigeria. Today, the oil market is fluctuating in earnings and the importance of agriculture in economic sustenance has now become a global issue. According to UNDP, Ethiopia (2012), global agricultural activities have become sophisticated and knowledge management can play a pivotal role in enhancing agricultural productivity and addressing the problem of food insecurity. If properly managed, it enables appropriate knowledge and information to reach knowledge intermediaries and smallholder farmers timely. Such delivery of knowledge and information undoubtedly minimizes the risk and uncertainty which smallholder farmers face from production to marketing of their produce.

The risks for subsistence farmers are acute since their livelihoods depend on sufficient production. In the main, they need risk mitigating skills and information on diversification alternatives and, assurances in the form of information that shows how they can sell their surplus production through conversion to more profitable new product. Subsistent farmers also need information on food security and, in addition, information on appropriate technologies and market opportunities, likewise, alternative employment or diversification opportunities and skills. Consequently, a new paradigm of agricultural development is fast emerging; in both developing and developed countries, the overall development of rural areas is expanding in new directions - old ways of delivering important services to citizens are

being challenged; and traditional societies are being transformed into knowledge societies worldwide (Okafor and Malizu, 2013).

Indeed, the world is at a crossroad of finding solutions to myriads of problems and challenges that are facing humanity. From unemployment to food insecurity, poverty to malnutrition, risk factors of maternal health to pandemic diseases, environmental degradation and global warming to other exponential dangers that are surfacing day by day; a plant is now being considered based on its multipurpose tendency as one out of many alternatives to solve malnutrition, other health problems and land fertility issues. The plant in question is Moringa oleifera. It has been potentially found to improve nutrition, boost food security, also foster rural development and support sustainable land use (NRC, 2006 cited in Osewa *et al*., 2013:830). Adebisi *et al*., (2014:22) also see Moringa oleifera in this perspective:

> It is a fast-growing tree, grown throughout the tropics for human food, livestock forage, medicine, dye, and water purification. It is also grown traditionally as backyard trees or hedges for its leaves which are used domestically as culinary. The increased awareness of the multiple uses of Moringa leaves and seeds for both domestic and industrial purposes is leading to an increased demand for it.

Moringa trees have been used to combat malnutrition, especially among infants and nursing mothers. Its leaves can be eaten fresh, cooked, or stored as dried powder for many months without refrigeration, and reportedly without loss of nutritional value. Moringa plant is especially promising as a food source in the tropics because the tree is still fresh at the end of the dry season when other foods are typically scarce (Brett, 2005; Fahey, 2005). It is commonly said that Moringa leaves contain more Vitamin A than carrots, more calcium than milk, more iron than spinach, more Vitamin C than oranges, and more potassium than bananas, and that the protein quality of Moringa leaves rivals that of milk and eggs (Olson and Carlquist, 2001). The oral histories recorded by Lowell Fuglie (2005) in Senegal and throughout West Africa report countless instances of life saving nutritional rescue that are attributed to Moringa. In fact, the nutritional properties of Moringa are now so well-known

that there seems to be little doubt about the substantial health benefit to be realized by consumption of Moringa leaf powder in situations where starvation is imminent.

Kasolo (2010) reports that *Moringa oleifera* was found to contain Phytochemicals which are non-nutritive chemicals that plants produce as a self defence mechanism. Phytochemicals present in *Moringa oleifera* include; catechol tannins, Gallic tannins, steroids, triterpenoids, flavonoids, saponins, anthraquinones, alkaloids and reducing sugars. These phytochemicals have been researched and are known to have medicinal values for human race such as detoxification and purification of water, antibiotics, skin treatment, anti-inflammatory, ulcers, blood pressure, diabetes, anaemia and many other uses.

The presence of this chemical indicates the possible healing properties of this species leaves and other parts of its tree. Natives in countries where *Moringa oleifera* grows know and understand the healing potency of this plant (Kasolo, 2010). For instance, the juice from the leaf is mixed with honey followed by a drink of coconut milk 2 to 3 times a day to help cure diarrhoea, dysentery and colitis in India and Senegal. Moringa leaves are applied to sores and skin infection and they are also prescribed to cure anaemia in Senegal. The leaves are also used for skin treatments to cure cuts, scrapes, sores, rashes and signs of aging. It is also used to help with anxiety and sleeplessness. In India and Senegal, the gum of Moringa is used to treat fevers, dysentery and asthma. The gum is used for dental decay in India. In Aruba, the paste of crush seeds is used to cure warts.

In spite of all the acclaimed potentials, *Moringa oleifera* has not enjoyed the full patronage expected for its numerous benefits among the vast populace in Nigeria especially in rural areas of the southern part where the study area is. Even where it commands some attention, its cultivation is still subsistent in nature and it is quite unclear, despite its properties, why *Moringa oleifera*'s popularity is limited. A number of factors are responsible for low agricultural productivity which also is the bane of *Moringa oleifera* cultivation and

utilisation, including a lack of technical knowledge, poor entrepreneurial skills, and meagre access to communication technologies that could help farmers, extension workers and others share information. Overcoming these problems, and improving access to markets, could help to increase farm productivity and incomes. The major setback in agricultural production in Nigeria which seems to be rubbing off on *Moringa oleifera* cultivation and utilisation is not lack of recommended practices needed for economic growth and rural transformation but that of disseminating the recommended practices to end-users (Obinne, 1994).

The traditional farmers in Nigeria, generally, are suspicious of new ideas, especially ideas based on theories by scientists and extension workers. Another reason for harbouring the suspicious attitude lies in the culture of the farmers and of the society in which they live. Most farmers in the rural areas do not understand the principles of scientific agriculture and have little interest in gaining information on these principles. They see their farms as ways of life and strive hard for incomes which are considered reasonable within their communities. They reduce their risks by having subsistence farm on which they produce almost everything they require. The actual information need of the rural farmer is usually in accordance with the challenge(s) confronting them at the time. Their needs could be how to control pest and diseases, environmental hazards, preservation of seeds/seedlings, finance and/or non-access to loan. This aligns with the saying that information is power. Consequently, when the information required by rural farmers is packaged in the language they understand and made available at the appropriate time, it will enhance agricultural productivity and ultimately food security.

The trend of development in agricultural extension delivery from material technologies to information and knowledge packaging through the electronic media is a possible solution to shortage of extension manpower in Nigeria to reach rural farmers. Information as a factor of production in the paradigm of development communication is a

critical input in agricultural extension delivery services to increase production, improve standard of living and sustainability. In fact, the effective development and management of *Moringa oleifera* can indeed contribute to sustainable growth and poverty reduction in developing countries. For this to take place, a balance must be found between the short-term needs of the people for their social and economic development and the protection of the natural resource base through the use of appropriate communication media. The medium of this dissemination could be called a channel. Channels of information communication are; interpersonal man to man through signals, signs, beckoning, language, and eye contact, town criers most especially in the primitive days and in villages.

Advancement in technology has made it possible for human society to communicate easily irrespective of geographical location through the aid of telephones, telegram, fax, radiophone, television, e-mail, telex, internet, intranet, computer etc. Popoola (2009) asserts that information is a critical economic resource, and when utilised, is capable of increasing the knowledge state of an individual in decision making which is necessary to solve innumerable challenges facing the world.

Today, all over the world especially the developing world, people are confronted with starvation, poverty, instability, threat of global warming, loss of natural vegetation, deforestation and gradual depletion of indigenous knowledge which has sustained generations before now to maintain balance ecosystem. The advent of colonisation, industrialisation, modernisation and globalisation are now posing a threat to the conservation of these invaluable assets of local people all over the world. Rural urban migration is ever increasing, and in its wake, is the dissatisfaction of present youths who form the bedrock of Nigeria workforce to engage in agricultural business. This reality is what entails in Ekiti State today.

Ekiti State with a population of about 2,384,212 (2006 census) could be termed as an agrarian society because about 70% of her population engaged in farming (NAERLS, 2010).

Ekiti State is the fifth largest producer of cocoa in Nigeria (NSEACN 2009/2010). The State is well endowed with abundant land resources with less than 7% of the land space occupied by urban areas gullies and rocks, outcrops and over 90% of the space is available for farming and agricultural related business. Also, forestry plantation thrives well in the State. Agriculture therefore stands out eminently as the surest means of setting Ekiti State on the path of economic growth, industrialization and development (Akintayo, 2007).

The high agricultural potentials of Ekiti State make the state to standout as major producer of wide varieties of crops, fishes and species of livestock. Therefore, the focus of this research which is promoting cultivation and utilisation of Moringa oleifera through proper communication channels to establish its potentials in the study area becomes imperative. Ekiti State has a total annual rainfall of about 1400mm with a low co-efficient variation of about 30% during the rainfall peak months, and with an average of about 112 rainy days per annum (Adebayo, 1993). The State consists of 16 Local Government Areas and covers a total land area of 23,212.64 square kilometers. It is dominated by derived savannah vegetation in the north and forest savannah in the south. Agriculture in the state is rain-fed while mixed cropping is widely practiced. The state is categorised into two zones based on agronomic and ecological considerations (Fakayode *et al*., 2008).

Land in Ekiti is endowed with favourable agro climatic conditions suitable for agricultural productions of both tree and arable crops. The estimated outputs of arable crops of Yam, Maize, Cassava and plantain in Ekiti State between 1996-2010 indicates that Ekiti State has comparative advantage in the production of arable crops in yam, cassava, maize and rice in that order. And as such, Ekiti State should intensify the use of her resources towards increasing their productions. Arable crops that are cultivated in all the 16 LGAs are maize, rice, plantain, tomatoes, okro, melon and water melon; while oil palm, citrus, mango, kolanut and guava are the tree crops commonly grown in all the 16 LGAs of Ekiti State. Cultivation

of Cocoa is prominent in all the 6 Local Government Areas of Ekiti South Senatorial Districts (Ekiti South West, Ise/Orun, Ikere, Emure, Gbonyin and Ekiti East); 4 Local Government Areas of Ekiti Central Senatorial District (Ekiti West, Ado, Irepodun/Ifelodun and Ijero); and 3 Local Government Areas of Ekiti North Senatorial District (Ido/Osi, Ikole and Oye). Other possible agricultural enterprises common to all the 16 Local Government Areas are aquaculture and fisheries, bee keeping, poultry, food processing and marketing. (EKSMARD, 2010).

Ekiti State has abundant tourism resources in their urban and rural places. There are several potentials for relaxation and holiday in their tourist attractions. The vistas of excellence in the state include Rocky Mountains, unique plants, forest reserves, parks, gardens, warm springs, lakes, buildings of historical significance, and several other man-made and natural features. Despite the numerous tourism potentials of the state, the level of participation in tourism is very low. This is due partly to ignorance of the benefits of tourism and mainly to the poor development state of the potentials. The tourist attractions in the state include geological and natural features, places of historic and archaeological significance as well as man-made and pre-historic sites. Ekiti State has the international atmosphere that makes it conducive for tourists all over the world. The environment consists of beautiful woodland scenery. It has a gentle and soft landscape which provides many places for children and others to play (Ibimilua, 2009).

In spite of all these potentials, Ekiti state is rated among the poorest states in Nigeria. There is no doubt that rain fed agricultural production predominates in Ekiti State. This fundamental fact is the major contributory factor to the low level of yield obtained in the State. Exploring the potentials of Moringa in the state therefore is a veritable venture that can strengthen the economy of many subsistent farmers in the state. Moringa requires an annual rainfall of between 250 and 3000mm. It is drought resistant, though in drought conditions it

may lose its leaves. This does not mean it is dead because it would recover when the rains arrive. It grows best at altitudes up to 600m but it will grow at altitudes of 1000m. It will survive in a temperature range of 25ºC to 40ºC but has been known to tolerate temperatures of 48ºC and light frosts (HDRA, 2002). Ekiti State ecological features therefore is friendly to Moringa cultivation and if promoted on a large scale can exploit the potentials of *Moringa oleifera* for the benefit of the state at large.

The study was focused on two local governments in Ekiti, which are Ikole LGA and Gboyin LGA. The study was specifically carried out in the northern part of the state. The area was chosen because of the high concentration of farming communities in the area. They are situated within rain forest and derived savanna agro-ecological division of the state. The research work was further justified on the basis that Moringa plant has potentials of flourishing growth in Ekiti because of abundance of rain and practice of agroforestry which can allow the farmers to keep to their usual farming system while planting Moringa as well. Its economic potentials and medicinal values can as well serve the local people of Ekiti in diverse ways.

1.2 Statement of the Research Problem

The link between research, extension and farmers has been difficult to achieve. Today, developing countries are experiencing various economic pressures and shortfalls, and find the costs of large research and extension services difficult to bear. Improved agricultural knowledge and information systems are being sought; systems that will be technically effective, cost-effective and people-effective. Bertoloni (2004) contends that, without appropriate means of disseminating information, poverty reduction, equity and opportunities will not be guaranteed and without access to contemporary communication technologies the gap between the rich and the poor will get larger.

Although *Moringa oleifera* (Lam) has been identified as a source of food, medicine and income globally, but in Nigeria, inadequate knowledge about its distribution, growth performance, appropriate silvicultural management practices, genetic improvement, germplasm conservation and the best provenances/strains that maximize its production have limited the prospect of utilising this valuable multipurpose tree species in many places in Nigeria including the study area. Little research has been conducted regarding cultural continuity and change through indigenous communication systems in respect of this plant.

Nigeria has a valuable but largely untapped reservoir of indigenous agricultural and natural resources experience and knowledge. Today, many indigenous knowledge practices are at risk of becoming extinct because of rapidly changing natural environments and fast pacing economic, political and cultural changes on a global scale. Practices varnish as they become inappropriate for new challenges or because of poor adoption (Nnadi *et al*., 2013). The traditional knowledge on Moringa is immense and thus necessitates needs for standardisation of its value chain.

Although there is a growing demand for Moringa leaf powder, seed and oil, its commercialization still remains very informal and limited. Reliable market information, such as production volumes and prices on the national and international markets, are difficult to obtain. Information about market requirements and the steps required in order to export moringa products from Nigeria is also hard to obtain. The same applies to information about the standards and minimum quality requirements that have to be met in order to produce for the international market. This kind of information and data, however, are indispensible for producers to make informed business decisions and to effectively exploit the existing potentials of the plant in the study area and Nigeria at large.

Too many development programs, including community-driven ones, seem to overlook the aspect of communication, which is intended as the professional use of dialogic

methods and tools to promote change (Mefalopulos, 2008). According to Okafor (2005) when communities participate in their own projects they become empowered which in turns improve efficiency, transparency and accountability which enhances service delivery and also encourages donor's harmonization. Also, stakeholders when not involved from the beginning, tend to be more suspicious of project activities and less prone to support them. On the other hand, when communication is used to involve them in the definition of an initiative, their motivation and commitment grow stronger (Okafor, 2005). The question therefore is; how can communication be used to complement other factors that can help sustain promotion of Moringa cultivation and utilisation for purpose of empowering the communities in the Ikole/Gboyin LGAs so as to achieve sustainable development?

1.3 Aim of the Study

The aim of this study is to improve on processes/methods used to disseminate information on cultivation and utilisation of *Moringa oleifera* in order to achieve empowerment and sustainable development among the people of Ekiti State.

The specific objectives of this study are to:

i. determine the level of awareness of farmers on Moringa cultivation and utilisation in selected Local Government Areas of Ekiti State;
ii. examine how Moringa cultivation and utilisation are being communicated to the people in the study area;
iii. Identify the challenges associated with communication tools used to disseminate information about Moringa among local people of Ekiti State, especially the study location.
iv. evaluate the information access of the people about the potentials of moringa value chain in empowering the local communities in the study area; and

v. Identify communication tools which can be used to effectively inform the people of the study location about Moringa value chain for empowerment purpose.

1.4 Research Questions

1. What is the level of awareness of selected farmers to cultivation and utilisation of Moringa?
2. How have Moringa cultivation and utilisation been communicated in the study area?
3. What are the challenges associated with communication tools used to disseminate information about Moringa among local people of Ekiti State, especially the study location?
4. How informed are the people about the potentials of Moringa value chain in empowering the local communities in the study area?
5. What are the communication tools which can be used to effectively inform the people of the study location about Moringa value chain for empowerment purpose?

1.5 Significance of the Study

The choice of *Moringa oleifera* in this research is based on the fact that in recent years, *Moringa oleifera*, a tropical, multipurpose tree has grown from being practically unknown, even unheard of, to being a new and promising nutritional and economic resource for developing countries. The leaves, which are easy to grow and rich in proteins, vitamins and minerals, are becoming widely used in projects fighting against malnutrition. Producing Moringa leaves is also a means of generating agricultural income, developing the food processing industry and founding new businesses. The Moringa tree grows widely in Africa, where, up until recently, it was used solely around houses to form hedges or to give shade. Occasionally it was used for medicinal purposes or collected for food. It is now becoming an emerging wonder plant of discourse at both home and market place. Therefore, it is being

realised that there is need for more exploration on how Moringa utilisation can become ubiquitous and common.

In Ekiti State, *Moringa oleifera* has the potential to be adopted as food for humans as well as a ruminant fodder. The animals are usually a source of sustainable livelihoods. Livestock production, in addition to crop production, is a strategy employed to raise farm income and reduce the food insecurity experienced by rural households due to the decline in agricultural sector (Jera and Ajayi, 2008). Considering the difficult agro-ecological conditions, which prevail in most parts of Ekiti State where subsistent farmers live, challenges encountered by the farmers seem to be important in successful Moringa production. With *Moringa oleifera* having such myriad of benefits, this study sought for analysis and documentation of the 'invisible information' of its production constraints in agro-forestry management systems under the smallholder farming sector in various agro-ecological regions of Ekiti and highlight opportunities. This information will act as basis for supporting the small scale farming communities in their quest to secure better livelihoods. This study is also of importance because the involvement of farmers in the value chain of Moringa plant is critical to optimising the plant potentials especially when the needed information is available at their disposal.

1.6 Scope of the Study

This study is about improving communication on cultivation and utilization of *Moringa oleifera* in Ekiti State. Two local government areas of Ikole and Gboyin were specifically explored to achieve this purpose. The study investigated various communication tools and channels both indigenous and modern that can be useful and adequate for farmers and other stakeholders in promoting the cultivation and utilization of Moringa, for its empowerment and better livelihood potentials.

The study covers 10 villages (communities), 5 each from the two selected local Government areas of Ekiti State. Both qualitative and quantitative approaches were triangulated to achieve the purpose of this study. 15 people were purposed for interviews and 208 respondents were administered with structured questionnaire in the study area. The research sought to examine the perception of the people of the communities especially as it relates to the myths surrounding Moringa utilisation especially its medicinal importance.

The study also explores vital subject matters surrounding Moringa value chain such as market availability, price, land accessibility, product security, and effective communication needed to promote its utilisation for purpose of achieving empowerment and sustainable livelihood in the study area.

1.7 Terminologies

Communication: The exchange of information on uses of Moringa plant which cut across medicine, nutrition, industrial usage, horticulture between the researcher and the selected farmers in the study area in order to achieve a better outcome of perspective about Moringa production and utilisation

Information: Available data on Moringa cultivation, processing, storage, marketing and methods of consumption for use of the selected farmers and the researcher

Development: This is concrete efforts of the selected people in the study area to use Moringa in practical sense so as to herald a change or progress in their livelihood especially income generation.

Empowerment: Generally, it is a process that give somebody power or authority and greater sense of confidence or self-esteem to be in control of decisions that affect his/her development economically, socially, mentally, physically and morally. Specifically, it is the conscious efforts of the target community to appropriate acquired information on Moringa cultivation and utilisation to improve upon their social status and economy which give them sense of achievement and wellbeing within their locality.

Moringa oleifera: An indigenous plant of Himalaya region found growing wild in northern India and Pakistan. It is now cultivated throughout the tropics and has multipurpose usage. It is now grown and found all over Nigeria.

Value Chain: This is the various products that Moringa can be turned to by farmers to bring about income and job opportunities. Products of Moringa plant include; Moringa tea, oil, water filter, fertilizer, animal feed, biogas, medicine, food, horticulture, Moringa soap and cream etc.

CHAPTER 2

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter reviews literature relevant to the study, to identify similarities or gaps concerning the concept of communication in terms of modern and indigenous knowledge systems, concept of participation, gender issues in communicating agricultural innovation and unveiling the myths surrounding Moringa cultivation and utilisation. Having grasp understanding of communication, empowerment and their roles in developmental issue is vital to agricultural programmes and any other development agendas of human volition. It is therefore necessary in this study to explore these concepts vividly.

2.2 Communication in Perspective

Communication has been defined in a variety of ways. No living thing can succeed without communication. Cole (2004:220) defines communication as “the process of creating, transmitting and interpreting ideas, opinions and feeling”. Communication is therefore a process by which people arrive at shared meanings through the interchange of messages. When people create and manage meanings and share their understanding of social reality, communication takes place. Political scientists, educators, business executives, linguists, poets, philosophers, scientists, historians, psychologists, sociologists, and anthropologists, to name some professionals, are concerned at least tangentially with communication in their specific areas of inquiry.

Communication scholars, by contrast, focus on facets of the communication process. They are in fact concerned with how understanding is (or is not) achieved and how messages influence important personal, societal, and global outcomes. Even though they use different tools for studying communication, their common interests, united focus, and complementary areas of expertise have formed a discipline. Communication researchers examine the

processes by which meanings are created and managed—in other words, how people structure and interpreted messages and use symbols such as language in interpersonal, group, organizational, public, intercultural, and mediated contexts. Thus the breadth of communication inquiry is universal and inclusive, and the contexts in which the communication process is examined are diverse yet interrelated. It is little wonder that no other discipline of knowledge is quite as universal as communication. Communication is a time-honoured yet modern discipline. The Greek philosopher Aristotle (384–322 B.C.) devoted much thought to examine the constituent elements of rhetoric, or the available means of persuasion.

Contemporary communication research cuts across interpersonal, group, and organisational communication contexts and the processes that occur during communication. In examining the flow of information and the interchange of messages between individuals in a variety of contexts, researchers today probe the uses and effects of modern communication technologies in a world where people and societies are linked by instantaneous transmissions via computers and satellites.

Communication as a discipline has attracted several definitions by different scholars in the field. Clevenger (1959) posited communication to be “any dynamic information sharing process”. Mefalopulos (2008) also viewed communication as the transmitting of information and messages, whilst Bertalanffy (1968) argued that communication often concerns the flow of information within a system. Bertalanffy’s (1968) definition was supported by O’Reilly and Pondy (1979) who defined communication as the sharing of information between two or more individuals or groups to reach a common understanding. Warnock (2007) introduced a new dimension by viewing communication as the ability to give information, to make one’s voice heard and to participate in discussion and debate.

Keyton (2011) also viewed communication as the process of transmitting information and common understanding from one person to another.

For many people the term communication is traditionally associated with either boosting an institutional profile or facilitating information flows within an organization. Mefalopulos (2008) categorized communication by focusing on its purpose and main functions in development organizations. Mefalopulos identified four types of communication which included corporate, internal, advocacy and development communication. Corporate communication is the type of communication which informs audiences about the mission and activities of an organisation through the use of the media. Internal communication is the sharing of information among staff in an organisation or institution to ensure all staffs are aware of issues pertaining to the institution. Advocacy communication is the type that helps to bring change to the lives of people using the available and the right medium. It is usually achieved through the involvement of chiefs, religious leaders and Community Based Organisation (CBO's). Development communication focuses on bringing change to people by involving the relevant stakeholders.

2.3 Development Communication

The term "development communication" was first coined in 1972 by Nora, Quebral, who defines the field as:

> the art and science of human communication linked to a society's planned transformation from a state of poverty to one of dynamic socioeconomic growth that makes for greater equity and the larger unfolding of individual potential.

More specifically, development communication refers to the practice of systematically applying the processes, strategies and principles of communication to bring about positive social change (Quebral 1972). The World Bank however, defines development communication as the integration of strategic communication in development projects (Manyozo 2006).

The theories and practice of development communication sprang from the many challenges and opportunities that faced development oriented institutions in the last century. Since then, different schools of development communication have arisen in different places over time (Manyozo 2006). Development communication scholars have identified two paradigms of development communication: the diffusion (or dominant) paradigm and the participation (or alternative) paradigm (Windhahl, Signitzer and Olson, 1992 cited in Fola-Adebayo, 2005). The diffusion model holds the view that innovative ideas and practices are accepted through the transference of such innovation from the innovators to those who will accept them in society. On its part, the participatory paradigm posits the view that communication effectiveness is enhanced when the receivers are actively involved in the processes of message production and distribution.

Also, each of these two paradigms has been associated with the theories of communication process and effects. The dominant paradigm for instance has been associated with one-way message transfer models of communication, while the alternative paradigm has been associated with two-way interactive models of communication. Development communication is therefore defined as the systematic utilization of appropriate or relevant communication channels and techniques targeted at increasing people's participation in development and to inform, motivate and train rural population mainly at the grassroots' level (Jayaweera, cited by Ngugi, 1995). Communication plays a dominant role in development efforts, particularly in the area of agriculture. MacBride et al., cited in Laninhun 2002:72 claimed that communication has tripod functions: increasing understanding of development problems; building up a spirit of solidarity in a common effort; and increasing the capacity of men and women to take charge of their own development. Receiver-oriented communication strategies alongside the activities of extension workers can play a key role in creating

awareness, changing attitudes and increasing the adoption rate of recommended innovations and practices in agriculture.

Development communication has gone through a chequered history and its essence is in its history. According to authors such as Agunga 1997; Anyaegbunam, Mefalopulos, and Moetsabi 1998; Fraser and Restrepo-Estrada 1998; and Mefalopulos 2003 the history of development has included failures and disappointments, many of which have been ascribed to two major intertwined factors: lack of participation and failure to use effective communication. Other recommendations to integrate communications into the development project included the treatment of communications as a resource, thereby integrating communications with economics (Jussawalla and Lamberton, 1982). The foregoing point is emphasized by Servaes (2003), who states that, "the successes and failures of most development projects are often determined by two crucial factors: communication and people's involvement".

As indicated by UNICEF (1999), effective development communication relies on the synergistic use of three strategic components. These components are advocacy, social mobilization and behavioural change (or behaviour development) communication. Advocacy is communication targeted at leadership and the powers that be to take actions to support programme objectives (UNICEF, 2008). Mefalopolus (2005) defined advocacy as mainly applied to promote a specific issue or agenda, generally at a national level which is often directed at changing policies or supporting policy-making changes, either addressing policy makers directly or winning the support of the public opinion. Social mobilization as defined by UNICEF (2008) is a process of harnessing selected partners to raise demand for or sustain progress toward a development objective. Social mobilization solicits the participation of institutions, community networks and social and religious groups to use their membership and other resources to strengthen participation in activities at the local level (UNICEF, 2008).

Consultation with the community is needed here to ascertain which institutions; social, political and religious groups will have the most influence on the primary participants. Behaviour change communication involves face-to-face dialogue with individuals or groups to inform, motivate, problem-solve or plan, with the objective to promote behaviour change (UNICEF, 2008). BCC according to the International Labour Organization (ILO) (2008) is an "interactive process for developing messages and approaches using a mix of communication channels in order to encourage and sustain positive and appropriate behaviours". ILO (2008) argued that BCC has evolved from information, education and communication (IEC) programmes to promote more tailored messages, greater dialogue and increased ownership together with a focus on aiming for, and achieving health-enhancing results.

As stressed by the World Congress on Communication for Development (WCCD) (2006), participatory approach became a key feature in the applications of ComDev to Sustainable Development at the end of the eighties where ComDev was conceived as the planned and participatory use of communication methods and tools that facilitate the sharing of knowledge and information, participation and change of attitude and practices aiming at achieving development goals agreed among all stakeholders. The 9th UN Roundtable on Communication for Sustainable Development held in Rome in 2004 recommended researches that addressed how to achieve and sustain the process and outcomes of ComDev. This required a participatory approach, a shared framework between development agencies and local stakeholders and community involvement in design, implementation and dissemination (FAO, 2005).

Warnock *et al*., (2007) opined that for development to be sustainable, it must be a process that allows people to be their own agents of change: to act individually and collectively using their own ingenuity and accessing ideas, practices and knowledge in the search for ways to fulfil their potential. Communication, by its very nature, is the essential

ingredient in ensuring meaningful participation, capable of resulting in the active exchange of knowledge and perceptions needed to successfully define problems and plan solutions (Mefalopolus, 2008). In this regard, communication goes beyond 'communicating' and enters a sociological dimension where it becomes instrumental in constructing realities as noted by Wilkins (1994).

Warnock *et al*., (2007) indicated that an increased power and ability to communicate is what poor people wish for themselves as much as the more tangible development benefits targeted by the MDGs. When 40,000 poor people were asked by the World Bank in 1999 what they desired most, having 'a voice' was one of the most frequent replies; not being able to have a say in decisions that affected their lives was identified as a key element of poverty in itself (World Bank, 1999).

The World Bank (1995) identified four types of participation which include information sharing, consultation, collaboration and empowerment. Information sharing and consultation were considered low-level forms of participation, while the two others were also considered high-level forms. These types of participation identified by World Bank (1995) are consistent with the other classification derived by a literature reviewed by Mefalopulos (2003) which included passive participation, where stakeholders attend meetings to be informed; participation by consultation, where stakeholders are consulted but the decision making rests in the hands of the experts; functional participation, where stakeholders are allowed to have some input, although not essentially from the beginning of the process and; and empowered participation where relevant stakeholders take part throughout the whole cycle of the development initiative and have an equal influence on the decision-making process.

2.4 Agricultural Communication

In every social system there is an interaction among all animate creatures in their quest to survive in their social environment. This implies that every living creature communicates. Communication is a key process in information dissemination in agriculture. The development of agriculture requires, among others, a timely and systematic transmission of useful and relevant agricultural information from the technology generation system (source) via various communication changes to the intended audience (receiver). It is expected that the client's changes in behaviour as a result of the message received (effect) be passed back to the source (feedback) for the communication process to be complete (Adebayo, 1997). Age (2009) thus defined communication as a process in which the participants create and share information with one another in order to reach a mutual understanding. In this process, emphasis is on interactive process of information sharing overtime to the ways in which participants interpret and understand information.

Agriculture plays an essential role in every culture throughout the world. Everyone has to eat. Our modern world is engaged in global commerce with nearly ubiquitous, instant communications. Through this access to this information, people are now becoming aware of what is in their food or how it is produced. Effective communication has long been recognized as vital to the food and agricultural enterprises of societies. Agricultural communications, in its simplest understanding encompasses all kinds of human communication in relation to agriculture, food, natural resources and rural interests. It obviously involves two wide streams of endeavour: communications and agriculture. As a discipline, agricultural communications seeks to connect these two well-established streams effectively somewhat akin to the role of a lubricant, integral and vital to an operating engine. Communications touches and serves all aspects of agriculture—in fact, it is integral to each

and woven throughout each. People have communicated about agriculture for millennia, using this interaction as a vital tool for survival.

The non-adoption of agricultural innovation by rural farmers and families can be explained by the inappropriateness to their special needs and resources of the technology to be transferred. This has become the greatest bane of agricultural communication as epitomised by Agricultural Extension Agents. The incorporation of farmers' knowledge into the agricultural research and innovation process is steeped in the participatory paradigm which requires a shift in the way individuals are considered, from passive recipients to active agents of development efforts. There are a number of reasons for this shift, a major one of which is presented by Ascroft and Masilela (1994) as thus:

> If peasants do not control or share control of the processes of their own development, there can be no guaranteeing that it is their best interest that is being served.

Common features of this perspective are the emphasis on people, the endogenous vision of development, and the attention to power and rights issues. It recognises that people - rather than technology-oriented approaches are required to find the right balance in achieving economic, social and environmental sustainability (Van de Fliert, 2007).

2.4.1 Extension Communication

The term extension was first used in the United States of America in the first decade of this century to connote the extension of knowledge from the Land Grant Colleges to the farmers through the process of informal education. Extension is a function of providing need- and demand-based knowledge and skills to rural men, women and youth in a non-formal, participatory manner, with the objective of improving their quality of life. Maunder (1973) defined Extension as a service or system which assists farm people, through educational procedures, in improving farming methods and techniques, increasing production efficiency and income, elevating their levels of living and lifting their social and educational standards.

The function of extension may be applied to several subjects, both agricultural and non-agricultural, such as health. When it is applied to agriculture, it is called agricultural extension. Adams (1982) defined Agricultural Extension as assistance to farmers to help them identify and analyse their production problems and become aware of the opportunities for improvement. Agricultural extension is primarily concerned with the following main aims:

i. Dissemination of useful and practical information relating to agriculture, including improved seeds, fertilizers, implements, pesticides, improved cultural practices, dairying, poultry, nutrition, etc.;

ii. Practical application of useful knowledge to farm and home; and

iii. Improvement of all aspects of the life of the rural people within the framework of the national, economic and social policies involving the population as a whole.

2.4.2 Extension Approaches/Strategies

A major role of agricultural extension in developing countries has been to disseminate technologies generated by public sector research organisations through appropriate dissemination strategies such as demonstrations, field visits, farmers' meetings, use of media etc. The theory behind this approach had been the 'diffusion of innovation' model suggested by Rogers (1962). Diffusion studies helped to show agricultural extension workers how to communicate new technologies to farmers and thus how to speed up the diffusion process. The model of technology transfer is often viewed as the linear model as it assumes a linear relationship between research, extension and farmer with organised publicly funded science as the source of innovation. This kind of extension models are usually top-down structures, often located within the ministry of agriculture.

I. The General Agricultural Extension Approach

The basic assumption with this approach is that technology and information are available which are not being used by farmers, and if knowledge of these could be communicated to farmers, farm practices would be improved. The purpose is to help farmers increase their production. Programme planning is controlled by government and Field personnel tend to be large in number and high in cost, with density varying from country to country. Resources required are also high, with central governments bearing most costs. Implementation is through a large field staff assigned according to governmental structure throughout the country, managed by the centre. Success is measured in terms of rate of adoption of important recommendations and increases in national production.

II. The Commodity Specialized Approach

The assumption here is that: the way to increase productivity and production of a particular commodity is to group all functions relating to it under one administration, including extension along with research, input supply, output marketing, and Extension programme controlled by a commodity organization. Implementation is through field staff of that organization. Resources tend to be provided by the commodity organization while the measure of success is usually the total production of the particular crop

III. Training and Visit Approach

One of the examples is the *Training and Visit (T&V) system* promoted by the World Bank in 1970s. The T&V system experienced apparent success in some countries, at least for a period of time. However, there are indications that T&V had many shortfalls. One of them is that it was essentially a supply-driven and top-down system, promoting agricultural messages that had been designed and developed by research scientists, with limited input from the technology users (farmers). The system was finally abandoned in late 1990s. The basic assumptions of this approach are that, under Ministry of Agriculture extension services,

the extension workers are poorly trained, lacking supervision and logistic support, and they do not visit and have contact with farmers. Further, it is assumed that subject matter specialists are poorly trained and not providing a link with research and training functions. So the purpose is to induce farmers to increase production of specified crops.

Programme planning is centrally controlled, and reflects interaction between research and extension personnel. Implementation efficiently is sought through: A rigid pattern of visits to farmers and training of field staff, along with strict discipline of daily and fortnightly activities. With funds from international sources, success is measured in terms of production increases of the particular crops covered by the programme.

IV. The Agricultural Extension Participatory Approach

Here the assumption is that farming people have much wisdom regarding production of food from their land, but their levels of living could be improved by learning more of what is known outside. It further assumes that effective extension cannot be achieved without the active participation of the farmers themselves, as well as of research and related services; that there is a reinforcing effect in group learning and group action; and that extension efficiency is gained by focusing on important points based on expressed needs of a farmers and by reaching more small farmers through their groups/organizations instead of through individualized approaches.

The purpose is to increase production and consumption and enhance the quality of life of rural people. Programme planning is controlled locally, often by such groups as farmers' associations. Where farmers' associations do not exist, the extension staffs assist to form them. e.g. Farmers Research Group. Implementation is through: group meetings, demonstrations, individual and group travel, and local sharing of appropriate technologies. Success is measured through the numbers of farmers actively participating and benefiting, as well as continuity of local extension organizations.

V. The Project Approach

This approach assumes that: a rapid agricultural and rural development is necessary and that the large government bureaucracy in the regular Ministry of Agriculture Extension Service is not likely to have a significant impact upon either agricultural production or rural people within an appropriate time frame, and that better results can be achieved by taking a project approach in a particular location, during a specified time period, with large infusions of outside resources. The purpose is often to demonstrate what can be done in a few years. Implementation typically includes project allowances for field staff, better transportation, facilities, equipment, and housing rather than. Short run change is the measure of success. (e.g. a forestation programme).

VI. The Farming Systems Development Approach

The assumption with this approach is that: technology, which fits the needs of farmers, particularly small farmers, is not available, and needs to be generated locally. The purpose is to provide extension personnel (and through them farm people), with research results tailored to meet the needs and interests of local farming system conditions. Programme plans evolve slowly during the process, and may be different for each agro-climatic farm eco-system type since they include a holistic approach to the plants, the animals, and the people in a particular location. Field personnel tend to be highly specialized, relatively expensive, and from outside the area being served. Implementation is through: a partnership of research and extension personnel with each other and with local farmers. The measure of success is the extent to which farm people adopt the technologies developed by the programme, and continue to use them over time.

VII. The Cost Sharing Approach

The assumption here is that the programme is more likely to fit local situations, and personnel are more likely to serve local people’s interests if part of the cost of agricultural

extension is paid locally. It also assumes that farm people are too poor to pay the whole cost, so central and regional governments typically provide most of it. Helping farm people learn the need to know for self-improvement and increased productivity is the purpose. Control of programme planning is shared by the various levels paying the costs. Success is measured by farm people's willingness and ability to provide some share of the cost, individually or through their local government units.

VIII. The Educational Institution Approach

In this approach, the assumption is that: faculties or colleges of agriculture have technical knowledge which is relevant and useful to farm people. The purpose is to help those people learn about scientific agriculture. Programme planning tends to be controlled by those who determine the curriculum of the education institution. Implementation is through non-formal instruction in groups, with individuals, and with other methods and techniques, sometimes conducted by a college or university with agricultural extension personal of another agency as the main audience. While considerable resources are required, success is measured by attendance and the extent of participation by farm people in the school's agricultural extension activities.

2.4.3 Review of Extension Approaches

While the practice of extension may have stuck in technology diffusion, more general thinking on the nature of agricultural technology development and promotion has advanced considerably in the last two decades. It is widely recognised that innovation comes from multiple sources, including farmers and how the agendas of different stakeholders are represented affects the 'appropriateness' of new technology developed (Sulaiman *et al.*, 2006). Farmer participation in technology development and participatory extension approaches have emerged as a response to such new thinking. New approaches such as Farmer Field Schools (FFS) and the Agricultural Knowledge and Information System (AKIS)

have been developed. Direct farm level links were stressed between researchers and farmers. More recently, the notion of extension as part of a wider system has emerged. For example, the 'interdependence model' (Bennet, 1992) and the 'innovation systems framework' (Lundvall, 1992) offer more inclusive ways of thinking about the actors and the institutional context in which the generation, diffusion and use of new knowledge takes place. The system of actors and process not only includes research and extension, but also technology users, private companies, NGOs and supportive structures such as markets and credit (Sulaiman *et al*., 2006). Table 2.1 below shows a summary of various approaches used in some African countries.

Table 2.1: Extension approaches in use in some Africa countries

Country	Current Model(s)
Angola	Rural Development and Extension Program; FFS
Benin	Participatory management approach; decentralized model; FFS
Burkina Faso	FFS
Cameroon	National Agricultural Extension and Research Program Support Project; FFS
Ethiopia	Model based on SG-2000 approach: Participatory Demonstration and Training Extension System; FFS
Ghana	Unified Extension System (modified T&V); pluralistic with NGOs and private companies part of the national extension system; decentralized; FFS
Kenya	Pluralistic system including public, private, NGOs; FFS; stakeholder approach (NALEP): sector-wide, focal area, demand-driven, group-based approach
Malawi	Pluralistic, demand-driven, decentralized; "one village one product;" FFS
Mali	Modified T&V; both private and parastatal services for cotton; FFS; SG2000
Mozambique	Government-led pluralistic extension; FFS
Nigeria	FFS; participatory; SG-2000
Rwanda	Participative, pluralistic, specialized, bottom-up approach; FFS
Senegal	FFS; government-led demand-driven and pluralistic system; FFS
Tanzania	FFS; group-based approach; SG-2000; modified FSRE from Sokoine. University of Agriculture's Centre for Sustainable Rural Development; private extension; decentralized Participatory District Extension; pluralism
Uganda	Pluralistic; National Agricultural Advisory Services (NAADS) is demand-driven, client-oriented, and farmer-led; SG-2000; FFS
Zambia	Participatory Extension Approach; FFS

(Adapted from Directorate of Agricultural Extension Services, Ghana)

The underlying goal of participation which now holds the anchor of agricultural communication is, to empower communities, groups or individuals to determine their own direction, objectives and options for change, make well informed decisions, take collective action to achieve their goals and monitor and evaluate if they are getting where they want to be. The goal of participation is to empower people by equipping them with capabilities and providing them opportunities to take control and give direction to the change process to improve their livelihoods (Huesca, 2003). It requires open sharing of information and opinions in all directions, identifying areas of conflicting interests and collective assessment and testing of options that can fulfil needs while capitalising on opportunities and compromising on conflicts. This places participatory communication at the core of sustainable development. Facilitation of participatory communication processes inherently implies "giving voice", hence power, to all parties involved. These processes should be based on a thorough stakeholder analysis. This analysis helps to understand who has what stake in the process and what functional and power relations exist amongst and within the different stakeholder groups (Jegede, 2014).

In rural areas, communication needs and available channels are facing tremendous changes through structural transformations: subsistence oriented farming remains the basis for food security especially in disadvantaged areas, while there is a general shift to move intermediate farmers into market-oriented production. Market-oriented farmers need to stay competitive in an increasingly global business environment. While Introduction of agriculture remains the mainstay for rural people, information and skills for alternative livelihoods gain in importance, not only as an exit strategy, but also for the increasing division of labour. Each of these groups of farmers has specific communication needs and capacities for innovation, management and finance. However, client/demand-oriented service provision for innovation, information, qualification and local organizational development remains the key driver. On-

going decentralisation of government functions and services improve the prospects of local political decision making. These reform processes and their opportunities and consequences need to be communicated properly to rural people. Lobbying by organized groups, as a form of communication to politicians, becomes a necessary activity to voice rural interests. On the other side, efforts to close the information gap and, in particular, the digital divide in rural areas, have been supported by the wider availability and accessibility of communication technologies and infrastructures, like internet, rural radio and mobile phones (FAO, 2006:5-6).

2.4.4 Agricultural Communication as a Tool for Empowerment

"Agriculture connects economic growth and the rural poor" but "its importance goes beyond incomes and reduces poverty by lowering and stabilising food prices; improving employment for poor rural people; increasing demand for consumer goods and services, and stimulating growth in the nonfarm economy" (OECD, 2006). Secure access to natural resources and their sustainable management is, in turn, key for agriculture-based livelihoods. Today, this is particularly important as climate change and growing competition over scarce resources (notably land and water) affect the natural resource base for agriculture and for rural poverty reduction (Brunori, *et al.*, 2008; World Bank, 2007; Nelleman *et.al*, 2009). Moreover, secure access to natural resources is at the core of poor rural people's entitlements as citizens, as rights over resources are often linked to membership in social organisations, recognition of collective identities, and access to services. In the communications domain, empowered people learn to understand their situation differently, and thus create a symbolic structure that they share, one which gives them a new social meaning of their situation and their relations with others.

Over the years, several agricultural programmes have been introduced to reduce abject poverty among rural dwellers, mostly farmers, in sub-Saharan Africa (SSA). Some of

these programmes include: United Nations Development Programme (UNDP), International Fund for Agricultural Development (IFAD), Agricultural Development Programmes (ADP), Food and Agricultural Organisation (FAO), and National Economic Empowerment and Development (NEED), The Directorate of Food, Roads and Rural Infrastructure (DIFRRI), National Orientation Agency (NOA), National Accelerated Food Production Programme (NAFPP), Green Revolution (GR), Operation Feed the Nation (OFN), etc. (World Bank, 1993, World Bank, 1995a, World Bank, 1995b; World Bank, 1996; Hashmi and Sial 2007; IFAD 2001), but it seems that these efforts have yielded little or no impact on the rural population, as evident in the literature (Afolayan, 1997). Consequently, the rate of poverty in rural areas keeps increasing steadily (Diamond, 1999; Handley et al., 2009; Gate 2014).

The drive to achieve food security, rural economic empowerment and national development objectives make the strengthening of agricultural production, storage and marketing, as well as research and development imperative. Amobi (2010) notes that national food security programme, according to the Federal Ministry of Agriculture and Water Resources, is to ensure sustainable access, availability and affordability of equality food to all Nigerians and for the country to become a significant provider of food to the global community. As a result, the Federal Government initiated the Growth Enhancement Support Scheme (GESS) to actualize the Agricultural Transformation Agenda (ATA) of just outgone Nigerian administration. The Federal Government of Nigeria implemented Agricultural Transformation Agenda (ATA) through a set of complementary programme interventions which aim to solve, in a holistic and integrated manner, the constraints and weaknesses that have held down agricultural development in the country for a long time. The government ATA programme seeks to grow and develop agriculture as a business and thereby create jobs, assure food security, promote private sector investments for wealth creation and maximize agriculture sector contribution to the country's economic growth. The transformation agenda

sets out to create over 3.5 million jobs in the agricultural sector through cultivation of; rice, cassava, sorghum, cocoa and cotton value chains, with many more jobs to come from other value chains under implementation. The agenda aims to provide over 300 Billion Naira (US$ 2 billion) of additional income in the hands of Nigerian farmers. Over 60 Billion Naira (US$ 380 million) is to be released into the economy from the substitution of 20% of bread wheat flour with cassava flour. In total, the agricultural transformation agenda will add 20 million metric tons to domestic food supply by 2015, including rice (2 million metric tons), cassava (17 million metric tons) and sorghum (1 million metric tons) (Okafor & Malizu, 2013).

As lofty as this scheme may sound, it also suffers the top-down syndrome of communicating development and the aim of the programme is yet to be achieved. Agbamu (2005) agreed that in many developing countries where Nigeria falls into, too little attention is paid to the understanding of farm-level realities. Always, there is a wide gap between those responsible for preparing and carrying out development plans and the farmers themselves. In most cases farmers in developing countries, who constitute extension clients, are never involved in planning the extension programme but relied on the relatively superficial observation of field officers or arm-chair deductions and rely on generalization of programme planners. Adedoyin and Adebayo (2005) opine that behaviour and motives could be attained by development of a sense of mutual trust and openness or through correcting distortions in communication by way of constructive feedback. According to Njoku (1991), extension agents are the main sources of farmer's information on improved technologies and are also responsible for educating farmers on the use of improved technologies. Abdullahi (2006) argues that there was bound to be a problem in the effectively delivery system because the higher the qualified extension agents the better their handling communication between them and the farmers they were meant to interact with. The wide gap of extension coverage has also been identified as an important factor hindering effective information utilisation between

farmers and extension workers/agents in developing countries. This disparity could as well hinder any meaningful intention for Moringa oleifera cultivation and utilisation.

There are several problems facing the Nigerian agricultural sector. According to Yahaya (2003), agricultural communications like any development communication accelerates interaction among farmers, leads to improvement in the quality of information output and confers statue or legitimacy on agricultural issues. It can also act as an institutional catalyst which departments, groups, organizations, institutions and governments can use to mobilize people for agricultural development. Mboho (2009) noted that although broadcasting cannot address the problems facing agriculture in Nigeria, it can however be used to draw attention to the issues and also embark on programmes to sensitize governments and other stakeholders. Soola cited in Mboho (2009) believes that even illiterate farmers, who are largely unknown or supported by the government or financial institutions can be information conscious and instructed if the broadcaster is sensitive to the farmer's culture, tradition and farming practices. For example, Perrazon in Mboho (2009) reported that Malawi operates an extension service which reaches farmers through extension agents, training centres and through the mass media. The Extension Aids Branch (EAB) broadcasts four half hours of radio each week.

Nigeria can use radio broadcasting to facilitate discussions and solutions on the numerous challenges facing farmers in the country. These challenges include infrastructural problems, manpower/skill development needs, socio-cultural problems and economic problems. Others are government/regulatory policies and environmental factors (Okuneye, 2002). Radio, given its unique features, especially the power of community radio can be used to mobilize stakeholders towards addressing the issues facing the nation's agricultural sector. Mboho (2009) noted that the use of broadcasting in disseminating agricultural information is an example of planned communication. McQuail and Windafil cited in Mboho (2001)

explained that this role of broadcasting emanates from a collective, organized source with a purpose and clearly specified objectives. Such communication through broadcast media is targeted to a specific section of the population and conforms to established norms (Mboho, 2009). It involves consultations with the people and stakeholders at the conception of messages, and programmes include a general programme encompassing interview of farmers, a music request programme interspersed with faming advice, a daily broadcast of agricultural news information amongst other techniques.

Agricultural extension continues to be in transition worldwide. Governments and international agencies are advancing structural, financial and managerial reforms to improve extension. Decentralization, pluralism, cost sharing, cost recovery, participation of stakeholders in development initiatives and the decisions and resources that affect them – these are some of the elements in extension's current transition and according to Rivera & Qamar (2003:23):

> A communication policy would aim to systematically promote rural communication activities, especially interactive radio but also other successful media such as tape recorder and video instructional programmes. Computers and the Internet may not yet be accessible to rural communities but they serve the communication intermediaries and agricultural extension agents who provide information to rural populations. Other devices such as cell phones hold considerable promise for the transfer and exchange of practical information.

For reaching the final agricultural and basic needs information users in rural areas today, radio is the most powerful and cost-effective medium .However, other traditional and modern communication methods are equally valuable, depending on the situation and availability, like face-to-face exchanges (via demonstration and village meetings); one-way print media (such as, newspapers, newsletters, magazines, journals, posters); one-way telecommunication media (including non-interactive radio, television, satellite, computer, cassette, video and loud-speakers mounted on cars); and two-way media: (telephone, including teleconferencing, and interactive (Internet) computer). Information and

communication technologies (ICTs) have proved to be important for Internet users and for the intermediate users who work with the poor. Pilot experiences show that various media are valuable for assisting agricultural producers with information and advice as to agricultural innovations, market prices, pest infestations and weather alerts.

Rural extension and radio need to be more purposely connected. Radio, according to contemporary specialists (FAO 2003), is underutilized at present. While ICTs and their connection to radio hold promise for the future, some consider radio to be "the one to watch" (FAO 2003). In the context of many countries, especially in Africa, community radio is emerging as one of the best forms of local community communication. Community Radio is a two-way process, interactive by its very nature. This concept of communication demands participation. The community radio aspires to achieve the ideal of making a local community a caring community and a better place to live in. As such it has potential to increase the awareness among its audience to participate actively in their social, economic and cultural development. Simply put, community radio aims at improving the living standards of the people and finding solutions to their local problems. The community radio is therefore, a tool for development, because it provides programming that is particular to the community's identity and character. It also focuses on local culture.

Interestingly, more and more African governments have now realised that radio is about the only way a largely illiterate, poor population can know what is going on and participate in development and debate. In this regard, rural community radio stations offer a bold and empowering message to all members of the community - men and women, young and old, people of different faiths, and disadvantaged poor, the marginalised - giving them both knowledge and a place to participate in public discussion.

2.5 Indigenous Knowledge (IK)

Indigenous technical knowledge is a new focus in development circles. Growing numbers of scientists and organizations are recognizing that it offers cheap, locally adapted solutions to development problems, or that it can be combined with scientific knowledge to boost productivity and living standards. Characteristically, most indigenous knowledge is not written down. It is held in people's heads, passed down from one generation to the next by word of mouth. Indigenous knowledge (IK) is ideas, beliefs, values, norms, and rituals, which are native and embedded in the minds of people. It is local knowledge which is unique to a given culture or society (Warren, 1987 cited in Akullo *et al*., 2007:3).

According to Rajasekaran 1993 (cited in Akullo *et al*., 2007:3), IK is the systematic body of knowledge acquired by local people through the accumulation of experiences, informal experiments and intimate understanding of the environment in a given culture. Local people, including farmers, local artisans, and cattle keepers are the custodians of IK systems. They are knowledgeable about their own situations, their resources, what works and what does not work, and how one change impacts other parts of their system. IK is dynamic and it changes through creativity and innovativeness as well as through contact with other local and international knowledge systems (Warren, 1991). These knowledge systems represent mechanisms to ensure minimal livelihoods for local people. IK systems often are elaborate and adapted to local culture and environmental conditions tuned to the needs of local people and quality and quantity of available resources.

A lot of IK has been lost due to the death of elderly people since there is no formal documentation of such knowledge. Some individuals also deliberately refuse to share the knowledge of IK they possess with others due to selfishness and desire for power/control. But most importantly, market- oriented production requires large scale production for producers to enjoy economies of scale. IK use has been limited in such production systems. Rural urban

migration has also significantly reduced agricultural labour force. In addition, increased modern scientific, effective and efficient methods have limited reliance on IT use. Some IK were completely abandoned while some are still in use and more discoveries being made through trial and error. Population increase and pressure has also led to intensification of agriculture in some areas and this requires use of modern techniques.

Despite the increased influence of modernization and economic changes, a few traditional agricultural management and knowledge systems are still predominant. These systems exhibit important elements of sustainability. For example, they are well adapted to particular environments, rely on local resources, are small-scale and decentralized, and they tend to conserve the natural resource base. Many farmers felt that IK use must be promoted in all farming practices. This was expected to give an opportunity to those who know more about IK to share what they know with others especially for some diseases and pests where modern techniques are not known or readily available. Most farmers using locally available resources for their livelihood are poor and need support to improve on the existing IK. Many farmers were optimistic that they would continue using IK because they hope to continue growing the same crops and keeping the same livestock using the same practice.

Today, indigenous knowledge can hardly cope with the new challenges. Many diseases and pests have emerged and affecting both local and improved crop varieties and livestock breeds. However, modern technologies require proper training to apply and maintain it. Therefore, many disadvantaged farmers will continue to use indigenous knowledge and practices. Current development trends have so far demonstrated that improved technologies are un-affordable for many poor farmers and they continually fall back on indigenous knowledge and practices. It is therefore paramount that research finds ways of identifying, collecting and validating indigenous knowledge practices. Such

information must be stored in a form that is retrievable for use and/or reference by future generations.

In Nigeria, it is encouraging to observe that, over the last two decades, there has been a dramatic rise in interest in the role that indigenous knowledge can play in truly participatory approaches to food security for sustainable development. It may not be accidental that the growing interest in the potential contribution of indigenous knowledge to development is becoming manifest at a time when current development models have proven not too successful. Recent research has given valuable insights into how people use their own locally generated knowledge to change and improve, for example, natural resource management. The agricultural sector provides a prime example. Farmers adopt a wide range of indigenous agricultural practices based on generations of experience, informal experiments and intimate understanding of their environments. The application of indigenous agricultural farming for example has reflected in the following:

• Indigenous soil preparation and planting materials

• Indigenous methods of controlling pests and diseases

• Indigenous methods of maintaining soil fertility

• Indigenous methods of controlling weeds

• Indigenous methods of harvesting and storage (Abioye *et al*., 2011)

Farmers employed various indigenous practices most of which were cross cutting among the crops grown. Early planting is one of the pillars for both indigenous and improved farming methods practiced. This is especially important in this agro-ecological zone where agriculture is rain-fed. Farmers take advantage of the early rains which also reduce the incidences of pest and disease leading to high yields. When farmers burn grass or trash in their farms, they prefer to plant or sow green vegetables and millet in it. The ash is assumed to be a source of nutrients and also burning is believed to kill crop pests. Farmers plant lab-

lab around their farms as they believe it prevents night dancers from intruding in their gardens and other related cases of witchcraft. Farmers also practice selection of clean planting materials as in the case of formal research to control pests and diseases. For the case of cassava, they ensure that the cuttings are not damaged prior to planting and that nodes face downwards to encourage effective sprouting and root growth. Farmers relied on crop rotation to rejuvenate the soil (Akullo *et al*., 2007:6-7).

For grain crops like beans, farmers ensure that beans are planted as the second crop in the rotation system. Broadcasting the seed before ploughing is still a popular method used when planting. Early plating is also preferred to allow crops receive enough rainfall and reduce pests and diseases incidences. Farmers also used concoctions of ash, goat droppings, dry and water as insecticide to control pests and diseases. Caterpillars were reported as the most important sweet potato pests. They are controlled by picking the infested leaves and burying them. Ash is sometimes mixed with human urine and sprinkled on vines. Farmers sometimes apply cow dung on potato vines and also rogue potato leaves. Lastly, farmers also carry out some form of rudimentary biological control of pests. They catch black Ants and release them in sweet potatoes fields to eat the caterpillars (Akullo *et al*., 2007:6-7).

2.6 Indigenous Communication

Dobb (1961:95-97) describes indigenous communication media as ranging from conscious activities like dancing and drama to unconscious and involuntary ones such as belching and even growing. In addition, Dobb outlines the following as constituting African indigenous communication: Speech, non-speech sounds like whistle, belch, skin colour, body growth or acquired characteristics like callused hand, rugged skin, spitting, sitting position, gesture, contrived face or dancing. Others, according to him, include imagination, dreams, fiction, drama, poetry, and music, scarification, tattooing, piercing of the ear etc. Also on his list are: drums, public address, radio and television, preserving symbols, such as carving,

footprints, writing, masks, print, drawing etc. Other examples given are hunting, fishing, agriculture, money, hut arrangement, rainbow, certain birds, animal rainfall etc. (Ojebode, 1998:4). It is important to quickly point out that it is erroneous to classify certain occupations like agriculture, fishing, hunting, etc. as means of communication. Again, it is also a mistake to classify public address, radio and the television as part and parcel of African Indigenous system. For Ugboajah (1985:116), indigenous communication could be called 'oral media'. According to him these media include:

> Mythology, oral literature (poetry, storytelling and proverbs), masquerades, rites of passage and other rituals expressed though oracy, music, dance, and drama, use of costume, social interplay and material symbol which accompany people from womb to tomb and beyond.

But how is this information communicated? How do people learn indigenous knowledge? Who is involved? How is the communication organized? There are few answers to these questions. Indigenous communication includes the transmission of entertainment, news, persuasion, announcements and social exchanges of every type.

Indigenous communication is important for many reasons:

1. Indigenous communication has value in its own right**:** It is an important aspect of culture and it is the means by which a culture is preserved, handed down and adapted. But indigenous communication is being eroded by exogenous systems - the mass media, new media, schools, agricultural extension, and bureaucracies - endangering the survival of much valuable information.
2. Exogenous channels have limited range: Television and newspapers are largely confined to urban areas in the Third World. Even the most widespread exogenous channels, extension personnel and radio, fail to reach many rural people. Indigenous channels, by contrast, are ubiquitous. They are needed to convey messages to people out of the reach of exogenous channels.

3. Indigenous channels have high credibility: Because they are familiar and are controlled locally, indigenous channels are highly credible. Local audiences are often sceptical of the externally controlled mass media.

4. Indigenous channels are important conduits of change: Research has shown the importance of informal, interpersonal contacts in persuading people to adopt, or reject, innovations. Such contacts are often made through indigenous channels.

5. Development programs can use indigenous communication to collect and to disseminate information: Outsiders can tap indigenous channels for information on the local situation and for feedback on project initiatives. Many projects rely on indigenous channels to diffuse innovations and development messages. Some have made explicit use of indigenous channels such as folk media and village organizations. There remains much untapped potential in using such approaches.

6. Indigenous channels offer opportunities for participation by local people in development efforts: They allow local people to communicate among themselves and with development professionals and decision makers. Local people can retain control over local media more easily than over technology-intensive media.

7. If indigenous communication is ignored, the result might be inappropriate development efforts: The literature on indigenous knowledge, agricultural development and environmental management provides abundant evidence of human activities which utilize complex but implicit scientific principles (Atte 1992; Warren 1992; McCorkle 1994; Lansing and Kremer 1995). It has also been demonstrated that the exclusion of such knowledge from development activities has had disastrous consequences in every region of the world where outsider knowledge has been imposed without regard to traditional knowledge (Cashman 1989; Lansing and Kremer 1995). Knowledge generation by rural people takes place through experiments which have implications for

locally based development (Howes and Chambers, 1979). It may be a scientific but a slower process of delivery than that of the modern government and privately supported research systems.

This type of local knowledge, called indigenous knowledge, includes knowledge of systems of classification and use of objects and materials, culture-related taxonomies (names given to plants and animals), making of artefacts, systems of measuring quantities, and an accumulated wisdom about what is workable in the local environment. Interest groups may possess certain types of knowledge and may not be willing to share it (e.g. knowledge of medicinal plants or of food sources in the wild, technology related to use of tree crops). Recognition of the value of such knowledge and technical systems is essential to ecologically sustainable development in rural areas; and essential to building a more reliable research base for future work. Problem-solving approaches require participation in order to integrate the knowledge generated in research institutions with indigenous knowledge generated by ordinary people.

Indigenous Knowledge System (IKS) is the sum of experience and knowledge of a given ethnic group that form the basis of their decision making in the face of challenges (Warren, 1992; Alonge *et al,* 2010). There is growing recognition and need to investigate and document existing indigenous technologies in the face of its importance in resource management, community survival and sustainability issues (Musa, 2006; Alonge *et al*, 2010). However, these indigenous technologies have been met with low productivity (Adegeye, 1995). This, in addition to other factors like increasing population pressures and consequent increase in food demand, has necessitated the introduction of improved technologies that will assist increase productivity. Improved technologies are the various new "technical know-how" for the promotion and development of agriculture. They alter the structure of agricultural production process through acting as a sure value for changing physical and

value productivity of farm resources (Olayide, 1982). Unfortunately, in Nigeria and other developing countries some of these improved technologies have been rejected by rural people (IFAD, 1998).

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In spite of the acculturation of the African man regarding the use of African indigenous communication systems, the African has not totally lost the moral values inherent in them. In fact, the indigenous communication system is more readily used in villages than in cities. Today, there is a cry to go back to the root as being experienced in alternative medicine, agricultural methodologies and other areas of life. This is to affirm the usefulness and relevance of them even in the contemporary society. This development to our mind calls for cultural renewal in which "Africans will do things according to their culture. Not only this, the need for cultural renewal regarding indigenous communication systems becomes imperative if an ethical re-orientation of African society is to be achieved. For ethical re-orientation programmes initiated by several peoples of African society to be meaningful, the time for the renewal is now and urgency to begin to value these indigenous communications should not be postponed in the face of threat posed by globalisation.

2.7 Overview of *Moringa oleifera*

Moringa oleifera is a native tree of north-western India. It is a fast-growing, drought tolerant tree now widely cultivated in tropical and subtropical areas of Africa, Latin America, Southern and South-Eastern Asia. It has a large number of names in many languages: in English it is called "Drumstick tree", "Horseradish tree", "Ben oil tree", in Spanish Marango, Zogele in Hausa, Ewe Ile or Igbale in Yoruba and Idagbo Monoye in Igbo.

The Moringa belongs to the family of *Moringaceae*, approximately 10 m tall. Its branches are drooping. The leaves are composed by 4-6 couples of leaflets plus the terminal one, the lower leaflets are divided again in sub-composed leaves. Each leaflet is oval, about 2 cm long and 1.5 large. The pods are triangular and ribbed, 25-40 cm long. Each pod contains 20-30 seeds. Seeds are winged, bright brown. It can be planted in sandy soil; it tolerates poor soil, including coastal areas (Mori *et al*., 2009).

Moringa trees have been used to combat malnutrition, especially among infants and nursing mothers; it is especially promising as a food source in the tropics because the tree is in full leaf at the end of the dry season when other foods are typically scarce (Fahey, 2005). The leaves are used fresh for salads or boiled as vegetable, they are highly nutritious, and they can be dried and crushed into a powder used in soups and sauces. They are also good forage for all livestock. The seeds contain 38–40% edible oil (called *ben oil* because of the *behenic acid* that contains). The refined oil is clear, odourless, and resists rancidity at least as well as any other botanical oil. The seed cake remaining after oil extraction may be used as a fertilizer or as a flocculent to purify water.

The immature green pods called “drumsticks” are probably the most valued and widely used part of the tree. They are commonly eaten in India and are generally cooked like green beans and have a slight asparagus taste. The seeds are sometimes removed from more mature pods and eaten like peas or roasted like nuts. The flowers are edible when cooked, and

are said to taste like mushrooms. The roots are shredded and used as a condiment; however, this should be strongly discouraged because they contain the alkaloid *spirochin*, a potentially fatal nerve-paralyzing agent.

A large number of reports on the nutritional qualities of Moringa now exist in both the scientific and popular literature: Moringa leaves contain large quantity of Vitamin A and C, beta-carotene, calcium, iron, phosphorus, potassium, and have good protein quality. However, the leaves and stem have large amounts of calcium bound in calcium oxalate crystals. Its leaves are full of medicinal properties including antiseptic, rheumatism treatment, venomous bites, and other.

The tree can be planted in medium density plantations for intensive cropping, it can be used for short windbreaks and green fences in large or little farms, and they are commonly planted in home gardens. The tree can be kept short in alley cropping plantation, cutting each year at 0.5 -1 m height in order to get seasonal re-sprouts up to 2-3 m high. A possible new use for the developing areas of tropics and sub-tropics can be oil production by micro-mills directly managed by groups of small producers in rural villages. The plant is propagated by seeding and cuttings. Seeds should be buried about 2 cm. Cuttings can be 0.5 -2 m long. The plant starts bearing pods 6–8 months after planting, but regular bearing begins after the second year. Tree podding is good for several years. It does not tolerate freeze or frost. Moringa is a sun- and heat-loving plant. Seeds are planted an inch below the surface and can be germinated year-round in well-draining soil (Muri *et al*., 2009).

2.7.1 *Moringa oleifera* as a Field Crop

Moringa has a dynamic potential to be grown as field crop, fodder crop, hedges and tree crop. Its foliage is used as animal fodder in different parts of the world especially in African countries but its forage potential is yet to be fully annexed. Newton *et al.* (2006) conducted a series of moringa cultivation experiments in Kumasi, Ghana to study the

optimum planting density and harvesting intervals for obtaining maximum moringa foliage. Maximum biomass was obtained when the seeds were sown at 5x5cm plant spacing and the foliage was harvested after every 40 days.

Palada *et al*., (2007) carried out a research project aiming at introducing and evaluating moringa species and accessions for their growth characteristics and horticultural traits which are ideal for production and nutrition. They collected 50 accessions, from which 42 accessions were representing four species (*M. oleifera, M. stenopetala, M. drouhardii* and *M. peregrina*). Twenty-two accessions produced sufficient seeds for replicated evaluation trials and seed distribution in first phase of the project (germination and seed multiplication phase). Ten best performing accessions were selected and evaluated in replicated trials for two years. They observed that three *Moringa oleifera* accessions had fresh young shoot yield with an average of 20 t/ha in 2004. In 2005, young shoot yield of all ten accessions increased from 29.1 to 41.8 t/ha while three *Moringa oleifera* accessions produced shoot yield of more than 40 t/ha. It was suggested that maximum shoot production could be obtained during the second harvest season from *Moringa oleifera* accessions.

Bezerra *et al*., (1997) reported the germination percentage of shelled and dehulled moringa seeds almost the same, i.e., 69% and 68%, respectively. Moringa plant has an amazing behaviour to grow on a variety of soils and climate due to its adaptability to different agro-climatic zones. The ideal soil condition for moringa optimum growth is sandy loam soil. Machado *et al.* (2008) observed a slight effect of substrate medium on moringa seeds' germination i.e., 60, 46 and 50% in sand, sandy clay and clay substrates, respectively. They also found that on clay substrate, the moringa plants grew at the rate of 2.0 cm/day, while in sandy and sandy clay substrates; the seedling development rate was 1.4 and 1.2 cm/day, respectively. The soil medium also affects moringa seed weight, germination and seedling development (Bezerra *et al.*, 2004).

These results have been restricted in information dissemination and communication only to scientific journals, print publications and other media that are only accessible to literate population whereas the rural people, have limited or no access to these discoveries. This is laying credence therefore to the need to create a meeting point between research findings and the local farmers. It may be argued that this is the critical role the extension agents tend to perform but reality on ground has shown that this synergy is still far from being achieved especially in the third world.

2.7.2 Moringa Multipurpose Usage

Several researches have indicated that *Moringa oleifera* Lam is a highly valued plant with multipurpose effects (Yang *et al*., 2006; Anwar *et al*., 2007; Adebayo *et al*., 2011; Moyo *et al*., 2011; Mishra *et al*., 2011). The tree ranges in height from 5 to 10 m (Morton, 1991). It is found wild and cultivated in many countries of the tropics and subtropics (Morton, 1991). It is considered as one of the world's most useful trees, as almost every part of the tree has an impressive effect of food, medication and industrial purposes (Khalafalla *et al*., 2010; Adebayo *et al*., 2011; Moyo *et al*., 2011). Different parts of this plant contain a profile of important minerals, proteins, vitamins, β carotene, amino acids and various phenolics and provide a rich and rare combination of zeatin with several flavonoid pigments (Nagar *et al*., 1982; Siddhuraju and Becker, 2003; Anwar *et al*., 2007). So it is a good source of natural antioxidants (Anwar et al., 2007; Jacob and Shenbagaraman, 2011). Moringa seeds can be eaten fresh or cooked, or it can be pressed into sweet, non-dessicating oil of high quality (30 to 40% of seed weight), commercially known as "Ben oil". Moreover, its unique property is the ability of the dry crushed seed and seed press cake which contain certain polypeptides to serve as a natural coagulant with antibacterial and antifungal activities, thus it has a compelling water purifying power (Ndabigengesere and Narasiah, 1998; Anwar *et al*., 2007). Concerning its medicinal value, it acts as cardiac and circulatory stimulants, possess anti-

tumour, antipyretic, antiepileptic, anti- inflammatory, antiulcer, antispasmodic, diuretic, antihypertensive, cholesterol lowering, antioxidant, anti-diabetic, hepatoprotective, anti-bacterial and antifungal activities and are being employed for the treatment of different ailments in the indigenous system of medicine particularly in South Asia (Morimitsu *et al*., 2000; Siddhuraju and Becker, 2003; Anwar *et al*., 2007; Moyo *et al*., 2011; Mishra *et al*., 2011; Jacob and Shenbagaraman, 2011).

In Nigeria, three multipurpose tree species i.e., *Moringa oleifera*, *Millettia griffoniana* and *Pterocarpus santalinoides* were studied to compare their biomass production and nutritional quality by Anele *et al*. (2008). Moringa was reported to have the best nutritive quality especially, crude protein, ADF, NDF and ether extract in comparison with the other plants of similar nature which acquire significant changes in relation to the seasonal changes. This mineral composition varies with climatic variations (Aslam *et al*., 2005).

There is no doubt that print media in particular Newspapers have been championing promotion of multipurpose usage of Moringa but the question remains still. Who are the audience of this mass media? It is evident that newspaper's circulation is limited majorly to cities and big towns in Nigeria which is a replica of what happens in other third world countries where major farming activities are few and not significant. In other words, the rural farmers are mostly exempted because these papers are not readily affordable with average price of ₦150 per heading; it is cost implicative and thus may not be affordable to a subsistent farmer. The language of most Nigerian dailies is English and very few newspapers are edited in local languages. Language is a critical ingredient in information dissemination and thus it has a big stake in communicating multipurpose usage of Moringa to the local people.

Abdalla (2013:42) reported the potential of Moringa oleifera extract as a bio-stimulant in enhancing the growth, biochemical and hormonal contents in rocket (*Eruca vesicaria*

subsp. sativa) plants. The plants were foliar sprayed with the aqueous extracts of leaves and twigs of *Moringa oleifera* at rates of 1, 2 and 3%. Among these concentrations, fertilization of rocket plants with 2% leaf and 3% twig extracts potentially increased all measured growth criteria (plant height, fresh and dry herb weight), photosynthetic rates, stomata conductance, the amounts of each of chlorophyll a and b, carotenoids, total sugars, total protein, phenols, ascorbic acid, N, P, K, Ca, Mg, Fe as well as growth promoting hormones (auxins, gibberellins and cytokinins). Besides, bio-organic manure with both kinds of Moringa extracts at all concentrations applied negatively reduced the levels of each of lipid peroxidation and abscisic acid as well as the activities of the antioxidant enzymes (catalase, peroxidase and superoxide dismutase). Thus, concluded that *Moringa oleifera* leaf and twig extracts should be recommended for use by farmers as a bio-organic fertilizer for various crops due to its high productivity, high nutritive value; antioxidant effect, and easy preparation, low cost and environmentally friendly nature. Therefore, the need to design a communication method or channel that will allow local farmers to appropriate this unique feature of Moringa as alternative fertilizer has become urgent and paramount in this dispensation when the deleterious effect of inorganic fertilizer is considered.

Stevens *et al*., (2013:799) while investigating ethno-medicinal and culinary uses of *Moringa oleifera* Lam. revealed that majority (78.7%) of the respondents used Moringa for the treatment of typhoid and malaria; 83.0% of the respondents agreed that the leaf part is the most widely used of the plant, while about 12% and 5% used the stems and the roots, respectively for this purpose. About 75.4% of the people sampled used the plant to treat ear infection while 18.9% and 5.7% used the stem and the root, respectively for the treatment of ear infection. Likewise, majority (66.9%) of the respondents used Moringa to cure eye infection, and 62.6% of the respondent used the leaves while 29.4% of the people used the root.

Fig 2.1: Traditional Medicinal uses of Moringa Plant

Other medicinal uses indicated by the respondents are infectious diseases along with cardiovascular, gastrointestinal, haematological and hepatorenal disorders (Siddhuraju and Becker, 2003; Morimitsu *et al*., 2000). Nitrile, mustard oil glycosides and thiocarbamate glycosides have been isolated from *Moringa* leaves, which were found to be responsible for the blood pressure lowering effect (Faizi *et al*., 1994). The arrays of ethno-medicinal uses of *Moringa* as documented by Stevens *et al*., (2013) were in conformation with the review of Farooq *et al*., (2012). This gave credence to traditional uses of Moringa plant for healing of various ailments by Nigerians as found elsewhere. Eze *et al*., 2012 also reported the potential of the leaf extract for treating Newcastle disease of poultry in Nigeria. Price (2000) and Fahey (2005) affirmed that Moringa is efficacious for the treatment of diabetes, high blood pressure, fevers, sores and skin infections. This assertion is also in support of Mughal *et al*., (1999) that Moringa has numerous medicinal uses, which have long been recognized in the Ayurvedic and Unani systems of medicine. Kasolo *et al*., (2010) in their study conducted on phytochemicals and uses of *Moringa oleifera* leaves in Ugandan rural communities

established that the leaves are used for treatment of twenty-four medical conditions such as diabetes mellitus, malaria/fever, hypertensive, syphilis and skin disease.

Rahman *et al*., (2009) investigated and suggested that the extracts and juice of *Moringa oleifera* Lam. can be used to discover antibacterial agent for developing new pharmaceuticals to control studied human pathogenic bacteria responsible for severe illness. Durgesh *et al*., (2013) reviewed *Moringa oleifera* Lam. (Moringaceae) as a highly valued plant, distributed in many countries of the tropics and subtropics. Moringa is best known as excellent source of nutrition and a natural energy booster. Different parts of this plant are being employed for the treatment of different ailments in the indigenous system of medicine. The Moringa plant provides a rich and rare combination of zeatin, quercetin, sitosterol, caffeoylquinic acid and kaempferol. In addition to its compelling water purifying powers and high nutritional value, M. oleifera is very important for its medicinal value.

Sakaba (2014:33) attested that Moringa cures Apollo (eye disease) and other ailments in this exploratory manner:

> This is achieved by squeezing moringa leaves and drop the water extract in the eyes. In the case of snake bite, it also works as a first aid treatment. If a snake bites somebody on the leg, for example, what need to be done is to tie the two sides of the leg. Then use new razor blade to cut the exact place where the snake bites a little, and then squeeze moringa leaves on to the wound. When the moringa juice drops on the wound, you will see the venom coming out.

He further adduced that moringa helps to cure ulcer when the leaves are grinded with little water and drunk. Moringa seed is used to manage high blood pressure, the coats that cover moringa seed cures bilharzia while the roots can be used to manage and cure rheumatism.

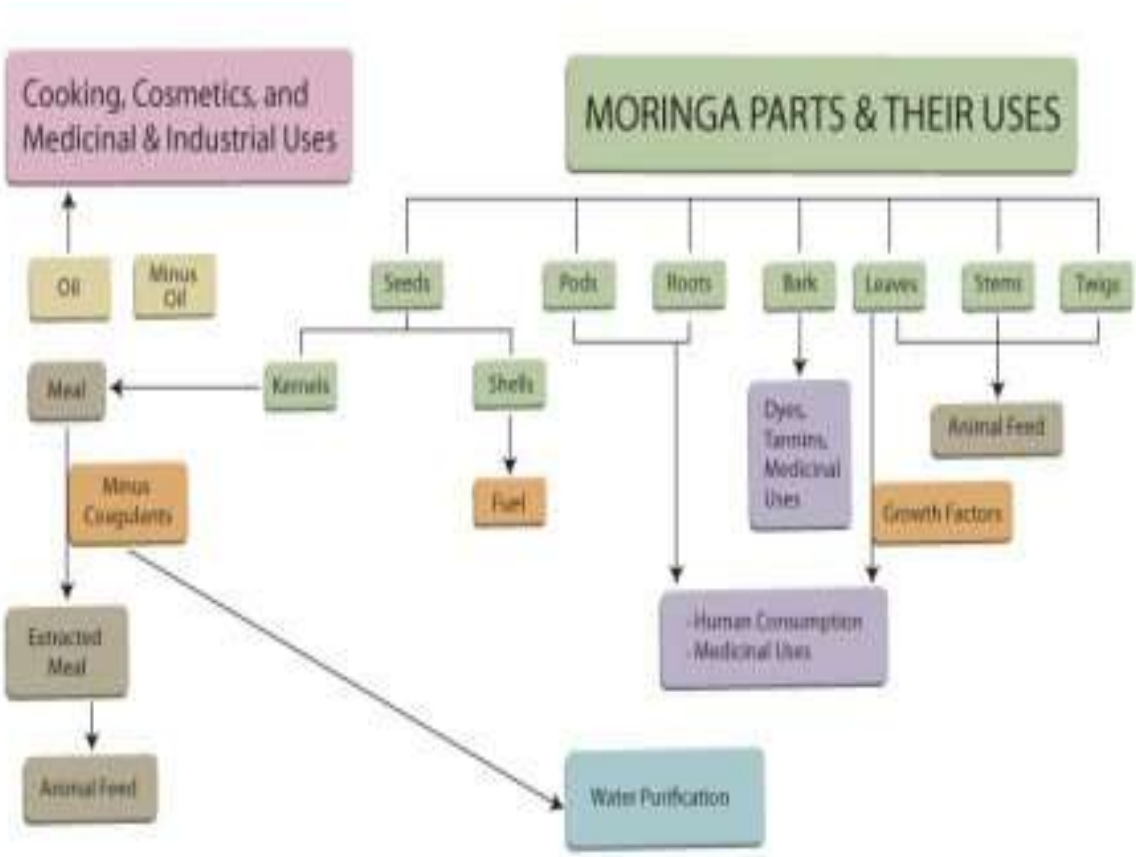


Fig 2.2: Value Chain of Moringa Plant

2.7.3 Cases of Moringa Cultivation and Utilisation Around Africa

Gadzirayi *et al*., (2013) in their study which sought to establish the cultivation practices and utilisation of *Moringa oleifera* provenances grown by small holder farmers in Zimbabwe, established that the common innovative cultivation system for *Moringa* is mixed cropping, where *Moringa* is planted together with fruit trees in the orchards or grown together with garden crops around homesteads. The leaf biomass was used as mulch and as organic fertiliser. A significant number of farmers, 63%, use *Moringa* for both medicinal purposes and household nutrition and, 9%, use it for household uses only such as water purification. They concluded that there is need for an efficient production system that enhances full realisation of the benefits of *Moringa oleifera* in the small holder farming sector.

Animashaun *et al*., (2013) examined the determinants of cultivation of Moringa crop by small-scale farmers in Kwara State, Nigeria. It also highlighted the level of awareness of the benefits of the crop among respondents. The study utilized questionnaire to collect data from 150 arable crop farmers through a 3-stage sampling technique. Results indicated that 47% of the respondents were aware of the nutritional benefits of the crop and 37.3% grow Moringa on their farms. Furthermore, awareness of crop benefits, farming experience, membership of cooperative society and the growing of other permanent crops were noted as significant factors affecting the cultivation of Moringa crop in the study area. They therefore concluded that the promotion of adequate enlightenment as regards the benefits of Moringa and the utilization of cooperative societies in enhancing value-addition to the Moringa crop should be encouraged.

Tee *et al*., (2014) compared the financial benefits female traders obtained from Moringa oleifera with that from other leafy vegetables in Jalingo Local Government Area markets. They also identified challenges of trade in Moringa leaves in the area. Data collected from 120 respondents through a semi-structured questionnaire were analysed. Daily mean Gross Income (GI) from Moringa leaves was ₦1,127.84, Amaranthus was ₦503.84, a Sorrel leaf was ₦367.80 and Ceratotheca leaves was ₦380.42. Daily mean GM of trade in Moringa leaves was significantly higher ($p<0.05$) than that from Amaranthus, Sorrel and Ceratotheca leaves. Trade in Moringa leaves therefore generated higher financial benefits than the other leafy vegetables. They highlighted that challenges of its trade were poor sheds/storage facilities, inadequate processing equipment and sources of credit, as well as rottenness and seasonality in yield. The study recommended the provision of rural infrastructures as well as processing and storage facilities to improve trade benefits to the traders from these commodities.

In the past two years, working with NCBA CLUSA's Moringa Value Chain (Moringa VC) Project in Niger, Karimou's income grew from $200 to $920 annually and has this to say:

> It used to be that after the hot season, we were left empty handed," Karimou says. "Now [with our moringa production] we have food, clothes, and money for education and healthcare for our children. We have used the profits from selling moringa to purchase animals, and even a new irrigation system for the garden to [further increase production].

This is the testimony of 56-year-old Lamisi Karimou, mother of nine, head of a 12-person household, and widow of 15 years. Karimou did not dream that she would one day be able to increase her annual income by more than 400%. NCBA CLUSA's Moringa VC project is taking full advantage of the benefits this plant has to offer to the people of Niger. The Mission of Moringa VC was to rapidly expand the production of moringa and the marketing, processing, and consumption of moringa leaves in Niger. During the three years' duration of the project, at a cost of less than $1.4M, Moringa VC managed to double the moringa cultivation in Niger while increasing the annual moringa related incomes per producer by $117. Women's involvement has been a large focus of NCBA CLUSA staff throughout the project with careful monitoring and evaluation of women's participation. At the project's close in April, 2012, there were 6,700 new moringa producers -- largely exceeding the project objective of 1,500 new producers. Women accounted for well over 60% of the new producers. (Nadeau & Zakaria, 2012).

In 1997-98, Alternative Action for African Development (AGADA) and Church World Service tested the ability of Moringa leaf powder to prevent or cure malnutrition in pregnant or breast-feeding women and their children in south-western Senegal (Fuglie 2001, Sambou 2001). Malnutrition was a major problem in this area, with more than 600 malnourished infants treated every year. During the test, doctors, nurses, and midwives were trained in preparing and using Moringa leaf powder for treating malnutrition. Village women

were also trained in the preparation and use of Moringa leaf powder in foods. This test found the following effects to be common among subjects taking Moringa leaf powder:

1. Children maintained or increased their weight and improved overall health.
2. Pregnant women recovered from anaemia and had babies with higher birth weights.
3. Breast-feeding women increased their production of milk.

Although there is a growing demand for moringa leaf powder, its commercialization still remains very informal. Reliable market information, such as production volumes and prices on the national and international markets, is difficult to obtain. Information about market requirements and the steps required in order to export moringa products from Nigeria is also hard to obtain. The same applies to information about the standards and minimum quality requirements that have to be met in order to produce for the international market. This kind of information and data, however, is indispensible for producers to make informed business decisions. To effectively exploit the existing potential, commercialization should become more structured and formalized.

2.7.4 Nutritional Value of Moringa

The most incredible thing about Moringa is the amount of nutritional and medicinal chemicals and compounds found in this plant. Fahey (2005), in a scientific publication, refer to popular publications promoting *Moringa* as a nutrient dense food source and give the following information: The importance of *Moringa* lies in the high nutritional value of its leaves, pods and seeds. “100 g of *Moringa* leaves contain four times more vitamin A than the same quantity of carrots; four times the calcium in a cup of milk; more iron than 100 g of spinach; seven times the vitamin C in 100 g of oranges and three times the potassium in 100 g of bananas. The protein quality of *Moringa* leaves also rivals that of milk and eggs” (Fahey, 2005). Therefore, *Moringa* is a relatively good source of vitamins, minerals and essential amino acids and could be considered as a good alternative to be used to help alleviate

micronutrient malnutrition at household as well as national level. The chart below gives a summary of some of the notable nutrients contained in this plant.

Figure 2.3: The Miracle Tree: Moringa oleifera: Natural Nutrition for the Tropics (Fuglie, 1999)

Fuglie (2001) and Marcu (2005) reported that *Moringa* leaves have about 40% protein with all of the nine essential amino acids present in various amounts. Because of this, *Moringa* is considered to have the highest protein ratio of any plant studied so far. Vitamin C is found in *Moringa* in large quantities. It was reported that 100 g of *Moringa* leaves contain more than 200 mg of vitamin C and a high content of vitamin A in the form of provitamin A or beta carotene (Fuglie, 2001 and Marcu, 2005). Table 2.5 shows that leaves and pods of *Moringa* are rich in minerals and vitamins and potentially are used in nutritional intervention programmes as a preventive measure against malnutrition. It has been observed that the nutrient composition of traditional vegetables has been recorded using different values, and furthermore unconfirmed data has been recycled in scientific and popular publications (McBurney, *et al.*, 2004). However, the high nutritional value of *Moringa* is widely recognised. Its value as a source of vitamin A is reported by Fuglie (2001) and as a widely quoted source reported the same data or recycled data, especially vitamin A in terms of 6.8 mg (milligrams) and not as 6800 μg (micrograms).

Table 2.2: The nutritional value of *Moringa* leaves and pods. (Adapted from Fuglie (2001)

Parameter	Pods	Leaves	Leaf Powder
Moisture (%)	86.9	75.0	7.5
Calories	26.0	92.0	205.0
Protein (g)	2.5	6.7	27.1
Fat (g)	0.1	1.7	2.3
Carbohydrate (g)	3.7	13.4	38.2
Fibre (g)	4.8	0.9	19.2
Minerals (g)	2.0	2.3	-
Ca (mg)	30.0	440.0	2003.0
Mg (mg)	24.0	24.0	386.0
P (mg)	110.0	70.0	204.0
K (mg)	259.0	259.0	1324.0
Cu (mg)	3.1	1.1	0.6
Fe (mg)	5.3	7.0	28.2
S (mg)	137.0	137.0	870.0
Oxalic acid (mg)	10.0	101.0	0.0
Vitamin A – Beta carotene (mg)*	0.11	6.8	16.3
Vitamin B – choline (mg)	423.0	423.0	-
Vitamin B1 – thiamin (mg)	0.05	0.21	2.6
Vitamin B2 – riboflavin (mg)	0.07	0.05	20.5
Vitamin B3 – nicotinic acid (mg)	0.2	0.8	8.2
Vitamin C – ascorbic acid (mg)	120	220.0	17.3
Vitamin E – tocopherol acetate (mg)	-	-	113.0
Arginine (g/16gN)	3.6	6.0	0.0
Histidine (g/16gN)	1.1	2.1	0.0
Lysine (g/16gN)	1.5	4.3	0.0
Tryptophan (g/16gN)	0.8	1.9	0.0
Phenylalanine (g/16gN)	4.3	6.4	0.0
Methionine (g/16gN)	1.4	2.0	0.0
Threonine (g/16gN)	3.9	4.9	0.0
Leucine (g/16gN)	6.5	9.3	0.0
Isoleucine (g/16gN)	4.4	6.3	0.0
Valine (g/16gN)	5.4	7.1	0.0

2.8 Theoretical Framework

This study was guided by Structuration Theory as conceived by Anthony Giddens (1984). This theory purports that any social structure is the result of recursive interaction among human agents, institutionalised rules and material resources. Communication situation in moringa cultivation and utilisation in this context refers to the social structure of reference whereas human agents and institutionalised rules refer to actors and mode of interaction as influenced by the prevailing material resources, in this case the communication ways/technologies. The study aims to show that respondents (targeted people), government agencies such as research institutes, extension agents, NGOs, other private interests as structures of society can be both constraining and enabling factors when it comes to disseminating information about Moringa value chain. The duality of structure is beneficial in the study of various channels and tools of communicating Moringa value where they act as both to restrict and reinforce action. An exploration of the responses from key Informants and other respondents will illustrate the changing agency of people associated with Moringa cultivation and utilisation within the scope of the study area flow of information.

As pointed out in structuration model, the interaction between technology institutional rules and human agents affect human's position within a socioeconomic structure. In the model, technology is seen as a product and medium of human action and that, an institutional condition of interaction with technology determines the consequences of interaction. Based on Giddens' concepts of duality of structure, dialectic of control and structures of domination, the researcher realize that development as a social change process is possible only when understood as a totality and not an individual level phenomenon. The proposition that oppressed and marginalized individuals can free themselves if they are given a voice, and ability to take control over their surroundings seems to exclude the role of structure as played out by social institutions. Giddens reminds us that social change is dependent on the

relationship between people and the institutions that govern the community. Thus, it is not individual change alone, but a collective movement that strives to change the structures of oppression which would in turn make sustainable social change possible.

Structuration theory argues that there is a duality as opposed to a tension or dualism between individuals and the social structure. As a result of the duality, the structural properties in a social system can serve as both enabling and constraining forces (Giddens, 1984). This offers us a theoretical framework against which communication of moringa cultivation and utilisation for development can be investigated. If the study can understand how participation through communication can be achieved between the researcher and the community, despite the larger structural constraints to participation it could have a meaningful impact on future development projects. Structuration theory provides us the language to understand how communities can exercise agency or have some kind of control over their lives as proposed by the participatory communication literature, and thereby informs us how social change can be achieved.

The primary concern of structuration theory is the conceptualization of human knowledgeability and its involvement in action. Giddens (1984:2) sees human social activities as being "recursive" over time and space. This implies that they are not brought into being by social actors but continually recreated by them via the very means whereby they express themselves as actors. In structuration theory, "to be a human being is to be a purposive agent, who both has reasons for his or her activities and is able, if asked, to elaborate discursively upon these reasons" (Giddens, 1984:3). This form of human reflexivity is replicative in that it facilitates unconsciously the creation and recreation of social systems. At this level too farmers and non-farmers alike may compare their Moringa practices with their personal belief systems. It is also at this level that they may personally experience the contradiction or ambiguities of their structural location.

According to Giddens (1984), action in the social sciences has to place at the centre the everyday fact that social actors are knowledgeable about the conditions of social reproduction in which their day to day activities are enmeshed. The reasons people have for their actions or what Giddens (1984) called the 'rationalization of action' are concerned with how those actions are sustained. Furthermore, Giddens (1984) believes that power is linked to action if power is defined as the capability of intervention or refraining from such intervention. In other words, an individual may choose to intervene or refrain from intervention "with the effect of influencing a specific process or state of affairs" (Giddens, 1984: 14).

Resources are drawn upon and reproduced by actors during the course of interaction but are not constituted as structures of domination. Resources then become the means whereby power is employed in the routine course of social action but they are at the same time structural elements of social systems, reconstituted in social interaction. Power in social systems can thus be treated as involving reproduced relations of autonomy and dependence in social interaction (Giddens, 1984). In societal terms, this implies that since actors know 'how to behave', they contribute through their actions, to the continuous production and reproduction of the social structure of rules. Without knowledge of these rules, social life would be impossible. Yet in every action there is the potential for actors to participate in changing the 'rules' or structure in further action. In this way, there is continuity and change in society.

One of the main tenets of structuration theory is the fact that rules and resources drawn upon in the production and reproduction of social action are at the same time the means of system reproduction "the duality of structure" (Giddens, 1984:15). By this he means that the structural properties of a social system are both the medium and the outcome of the practices that make up those systems. Structure therefore could be seen as both

constraining and enabling. The duality of structure "is the main grounding of continuities in social reproduction across time-space. It in turn presupposes the reflexive monitoring of agents in and as constituting the flow of conduct, the 'duree' of daily social activity" (Giddens, 1984:26-27).

Giddens (1984) identifies social structures as being Signification, Legitimation and Domination. Through their modalities, these social structures allow individuals to communicate with each other, have their actions and interactions socially sanctioned and have power over other human agency and non-human resources authorizing a person's agency and allocating resources. How these modalities are interpreted will rely upon an individual's stock of knowledge and facility with language; norms that will provide the individual with social rights and a facility for activating their agency through the exercise of power. Power then is viewed not necessarily as repressive but also as a productive force. "It is not an obstacle to freedom or emancipation, but is their very medium" (Giddens,1984:257). Structuration theory therefore lay credence to the fact that if farmers are properly informed and communicated on various issue surrounding Moringa cultivation and utilisation they become enabling channel to promote is acceptance on a large scale in the study area but where this is not achieved, they become the limiting factor to its emancipation.

CHAPTER 3

METHODOLOGY

3.1 Introduction

In this chapter, a description of the study area and the study population is provided. The chapter further documents the details of the research method in terms of sampling, data collection and data analysis techniques that were used. Furthermore, it also discusses the strengths and limitations of these methods based on practical experiences and expectations from the research work.

3.2 Research Design

This research is action based research. Action research comprises a family of research methodologies bringing together a variety of research and intervention methods of a quantitative and qualitative nature in a research design. It is within this perspective that the research design for this study was used to address the gathering of data, making use of semi-structured interviews and key informant interviews. It was also used to understand real situations of the study area, and also chosen for circumstances that require flexibility, the involvement of the people in the research, or change which could take place quickly or holistically. It was used with intention that it will improve understanding of Moringa practice and action campaign on its value chain.

3.3 Study Population and Location

Ekiti state which was carved out of Old Ondo State on October 1, 1996 is situated in the southwest of Nigeria. It has sixteen Local Government Areas (LGAs) on creation. Ekiti State is situated entirely within the tropics. It is located between longitudes 40°51′ and 50°451′ east of the Greenwich meridian and latitudes 70°151′ and 80°51′ north of the Equator. It lies south of Kwara and Kogi State, East of Osun State and shared boundary with Ondo State in the East and in the south, with a total land Area of 6,353 km^2 (2,453 sq. mi).

The capital of the state is Ado-Ekiti. The population of Ekiti State stood at 2,384,212 people with reference to the 2006 population census.

The State is mainly an upland zone, rising over 250 meters above sea level. It lies on an area underlain by metamorphic rock. It is generally undulating country with a characteristic landscape that consists of old plains broken by step-sided out-crops that may occur singularly or in groups or ridges. Such rocks out-crops exist mainly at Aramoko, Efon-Alaaye, Ikere-Ekiti, Igbara-Odo- Ekiti and Okemesi-Ekiti. The State is dotted with rugged hills, notable ones being Ikere-Ekiti Hills in the south, Efon-Alaaye Hills on the western boundary and Ado-Ekiti Hills in the centre. An important feature of the state is the large number of hills it possesses, which are often the site of towns in which much of the population resides. Indeed, the word 'Ekiti' was derived from the local term for hill.

The State enjoys tropical climate with two distinct seasons. These are the rainy season (April–October) and the dry season (November–March). Temperature ranges between 21° and 28 °C with high humidity. The south westerly wind and the northeast trade winds blow in the rainy and dry (Harmattan) seasons respectively. Tropical forest exists in the south, while savannah occupies the northern peripheries. Moreover, the land is buoyant in agricultural resources with cocoa as its leading cash crop. It was largely known that Ekiti land constituted well over 40% of the cocoa products of the famous old Western Region. The land is also known for its forest resources, notably timber. Because of the favourable climatic conditions, the land enjoys luxuriant vegetation, thus, it has abundant resources of different species of timber. Food crops like yam, cassava, and also grains like rice and maize are grown in large qualities. Other notable crops like kola nut and varieties of fruits are also cultivated in commercial quantities.

For this study, two local government areas of Ikole and Gboyin formed the study population.

3.4 Sampling Technique

Both probability sampling and non-probability sampling were used to get the population for study. Based on reconnaissance survey conducted which shows that 516 farmers are into agroforestry practice (Taungya system of farming) a proportionate sampling (probability) was used to get respondents that are into agroforestry practice. This is because Moringa plant is an agroforestry plant and most farmers have been known to cultivate it with other arable crops or as a hedge. However, Moringa utilization is not limited to only farmers; other citizens of the society use it for one purpose or the other. Therefore, purposive sampling method was used to select 104 respondents from the 10 communities. Total sampled population for the study was 208 respondents.

Table 3.1 The Sampling Procedure and Sample Size through Purposive Sampling (n=104)

Senatorial District.	Agro-ecological zones	Selected LGAs	Selected Villages	No of Tungya farmers	No of respondents (20%)
Ekiti North	Guinea Savanna	Ikole LGA	Odooro	60	12
			Ijesa-isu	48	10
			Ayebode	56	11
			Ayedun	34	7
			Ikole	58	12
Ekiti South	Tropical Rain forest	Gboyin LGA	Ode	49	10
			Ijan	65	13
			Iro	60	12
			Agbado	40	8
			Aisegba	46	9
Total				516	104

3.5 Method of Data Collection

The study used primary data, which was collected with the aid of structured questionnaire, with open and close-ended questions. Observation and interviews (unstructured individual) were also used in data collection. This participatory approach,

though difficult to quantify, provide a valuable insight into the multiple meanings, dimensions and experiences with this particular plant species.

Interview Method

Interviews were conducted with individuals that were identified as stakeholders who include Local government representatives, ADP personnel, Moringa farmers, traders of Moringa products and users. For this purpose, semi structured and Key informant interviews were employed. Fifteen people were interviewed on various issues that concern Moringa communication in respect of its cultivation and utilisation. Semi-Structured Interview is a guided interviewing and listening in which only the topics and questions are predetermined, and new questions and insights arise as a result of the interview. It is characterised by the use of checklists and open-ended questions; flexibly allows for probing, triangulation and for information to be generated in a participatory manner. Unlike the structured interview, SSI concentrates both on the questions asked and the context in which the interview takes place. The interviews were conducted with agriculture extension workers in the two local government areas, and 1 person identified as marketers of Moringa products in Gboyin local government. It was in-depth. In-depth interviews are very useful for dealing with individuals that could not come to a common place for a group session in addition to that they also provide detailed information on individuals that could not be obtained in a focus group discussion (Patton, 1990: 20). The semi-structured questions were used because according to Bryman, (2008: 196) which stated as follows:

> Semi structured questions are somewhat more general in their frame of reference as opposed to the structured interviews. In addition to that the interviewer is free to probe further and ask more questions to the interviewee basing on the replies that are being generated.

Key Informant Interviews: Key informant interviews are "individual interviews that are conducted with people who have specialized knowledge about the topic of interest" (Bernard and Ryan, 2010: 370). In this study, the people that were in the forefront in message

development at the two local government headquarters were interviewed. Other key informant interviewed included the leader of women selling herbal medicine in Ikole market, Chairman of Ikole local Government, a High Chief of Ikoyi in Ikole Ekiti, who served as bastion for indigenous knowledge and a Marketer of Moringa products at Ode Ekiti in Gboyin Local Government Area.

Observation Method

Direct observation was employed to watch interactions, processes, or behaviours as they occur. It also involved documenting events and informal conversation with farmers in different circumstances throughout the study period. This tool of evaluation was used for this study because it helped to collect data where and when an event or activity of is occurring. It does not rely on people's willingness or ability to provide information and allows the researcher to directly see what people do rather than relying on what people say they did concerning Moringa issues.

Questionnaire

A questionnaire is a set of printed questions, usually with a choice of answers, devised for a survey or statistical study. This was used in the study with both open and close ended questions for the respondents to explore so as to bring in their own initiatives outside the prescribed answers. It also contained scaled questions which allowed responses to be graded on a continuum. Likert scale was applied for this questionnaire to grade the perceptions of responses to varying issues on scaled questions. Likert scale was convenient for this purpose because it does not demand too many statistical configurations which may take the study out of humanities.

3.6 Analytical Techniques

Quantitative data were statistically analysed using computer software programme, (Statistical Package for Social Science); to yield some statistics for comparison and

establishment of nature of relationship between variables. Content analysis was applicable to qualitative tools in the study.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results and discussion of the study as it addresses the five objectives of the research. The chapter is divided based on the objectives and the demographic information. The first part explains the demographic characteristics of the respondents while the remaining parts are tailored in respect of the objectives of the study as earlier stated in the work. The results are presented in tables and figures using descriptive statistical tools such as mean, percentage and frequency. Likert scale was also employed to measure the degree of perception of respondents in the study area to issues that pertain to how communication can be effectively used in promoting Moringa cultivation and utilisation. The results were further discussed based on interviews and opinions of key Informants, and reference to relevant documented literatures. The chapter concludes with findings and implications of the research work.

4.2 Demographic Information of Sampled Population of Ikole and Gboyin Local Government Areas of Ekiti State

Table 4.1: Socio-Economic Characteristics of Respondents selected from Ikole and Gboyin Local Government Areas

Variables	Frequency		Average %	Average Mean
Age	**IKOLE**	**GBOYIN**		
11 – 20	1 (1.03)	3 (3.3)	2.0	**33.7**
21 – 30	30 (30.9)	41 (45.1)	37.8	
31 – 40	29 (29.9)	20 (21.9)	26.1	
41 – 50	20 (20.6)	12 (13.2)	17.1	
51 – 60	7 (7.2)	2 (2.2)	4.7	
No Response	10 (10.3)	13 (14.3)	12.2	
	97	**91**		
Sex				
Male	58 (59.8)	49 (53.8)	56.9	
Female	39 (40.2)	42 (46.2)	43.1	
Marital Status				
Single	18 (18.6)	46 (50.5)	34.0	
Married	78 (80.4)	45 (49.5)	65.4	
Widowed	1 (1.03)	0	0.5	
Divorced	0	0	0	
Household Size				
1-4	54 (55.7)	50 (54.9)	56.9	**4.4**
5-8	30 (30.9)	32 (35.2)	33.0	
9-12	2 (2.1)	1 (1.1)	1.6	
13-16	1 (1.03)	0	0.5	
> 16	4 (4.1)	1 (1.1)	2.7	
No response	3 (3.1)	7 (7.7)	5.3	
Level of Education				
Primary Education	2 (2.1)	1 (1.1)	1.6	
Secondary Education	10 (10.3)	4 (4.4)	7.4	
Tertiary Education	70 (72.2)	78 (85.7)	78.7	
Adult Education	4 (4.1)	1 (1.1)	2.7	
No formal education	2 (2.1)	0	1.1	
No response	9 (9.3)	7 (7.7)	8.5	

Source: Field Data from Ikole and Gboyin LGA Assessment 2015

The socioeconomic characterisation of respondents is necessary so as to explain the features of the participants in respect to Moringa cultivation and utilisation. These serve as

platform to provide information on strength and weaknesses of the respondents as regards empowerment potentials of Moringa value chain. The socioeconomic characteristics which were evaluated include: age, gender, marital status, household size, educational level, and years of awareness.

4.2.1 Age Distribution of Respondents

Table 4.1 reveals that majority of the respondents fall within the age bracket of youths (21-40) representing 60.8% in Ikole LGA and 67.0% in Gboyin LGA. This is economically productive age whereas 27.6% are from age 41-60. It was noticed that 10.3% and 14.3% respondents respectively did not give their age in Ikole LGA and Gboyin LGA. Age has been found to determine how active and productive the head of the household is (Amaza *et al*., 2007). The respondents' age distribution implies that active participation is feasible for Moringa cultivation and utilisation in the two local government areas under study.

4.2.2 Distribution of Respondents Based on their Sex and Marital Status

From Table 1, the ratio of respondents based on gender is 59.8% and 53.8% for male in Ikole LGA and Gboyin LGA respectively and 40.2% and 46.2% for female respondents in Ikole LGA and Gboyin LGA. This result shows fair representation and gender sensitivity in distribution of the respondents across the two LGAs. This population ratio also underscores the increasing participation of female folks in developmental issues across all facets of life. Also from this table, it could be deduced that 80.4% and 49.5% of the population are married in Ikole LGA and Gboyin LGA. This result implies that Gboyin LGA has more young respondents and higher number of youths. The married population is a positive factor to realising sustainability of Moringa cultivation and utilisation in Ekiti State because being married has been regarded as a means of evaluating household and non-household contribution to the development of a community (Mohammed, 2012). This also synchronises with assertion of Baker (2003) that married people are found to be more participative and

initiative in community development programmes. The singles are 18.6% and 50.5% in Ikole LGA and Gboyin LGA respectively while only Ikole LGA had 1.5% sampled population as widow. The significance of marital status on agricultural production and livelihood activities can be explained in terms of the supply of agricultural family labour. It is expected that family labour would be more available where the household heads were married (Amaza *et al*., 2009).

4.2.3 Household Size of Respondents

The distribution of the respondents by household size showed that 55.7% of the respondents in Ikole LGA having 1-4 members whereas it was 54.9% in Gboyin LGA. Household of 5-8 members were 30.9% and 35.2% in Ikole and Gboyin LGAs. In Ikole LGA, 2.1% of the respondents had 9-12 members while Gboyin LGA had 1.1%. It is only in Ikole LGA that respondents representing only 1% of the population had 13-16 household members while respondents with above 16 household members constitute 4.1 and 1.1% of the population in Ikole LGA and Gboyin LGA. The significance of this spread is that majority of the respondents are within 1-8 household members representing 86.6% and 90.1% of the population in Ikole and Gboyin LGAs in that order. Thus the calculated mean value (average) of household size of the population was found to be **4.4** which implies that the family of each respondent has at least 4 people in the house. This is a moderate population.

4.2.4 Educational Level of Respondents

Table 1 also expresses the educational attainment of respondents as follows: 2.1% and 1.1% had primary education in Ikole and Gboyin LGAs, 10.3 % and 4.4% respondents in Ikole and Gboyin LGAs have secondary education, while 72.7% and 85.7% respondents have tertiary education in Ikole and Gboyin LGAs. 4.4% and 1.1% have only adult education in Ikole LGA and Gboyin LGA. The result shows that in Ikole LGA, only 2.1% of the respondents have no formal education. It was evident from the result that majority of the

respondents are educated. The level of literacy is indeed very essential to capacity building and conceptualisation of innovative ideas around Moringa cultivation and utilisation. This is indicative that the level of education of the household in decision making is essential in determining the household's ability to access, process and implement information on agricultural technologies (Zbinden and Lee, 2005).

Table 4.2: Population of Respondents from Selected Communities of the Study Areas

LOCAL GOVT	COMMUNITY	NO OF RESPONDENTS
IKOLE LGA	Odo-Oro	22
	Ijesa-Isu	13
	Ayebode	20
	Ayedun	18
	Ikole	24
GBOYIN LGA	Ode	20
	Ijan	18
	Iro	19
	Agbado	16
	Aisegba	18
		188

Source: Field Data from Ikole and Gboyin LGA 2015

Table 4.2 shows the distribution of respondents from the two LGAs comprising of five communities each. Ikole LGA has total number of 97 respondents while 91 respondents represent Gboyin LGA. This table is a summative reflection of table 4.1.

4.3 Level of Awareness of Respondents in the Study Area on Moringa Cultivation and Utilisation

Awareness is a critical factor in the adoption and utilisation of any agricultural innovation. This section therefore looks at how the sampled population of Ikole and Gboyin LGAs came about knowing Moringa, how long they have been using it, the form it is used and the purpose it is used for. The section also looks at awareness level in relation to consumption

of Moringa and when Moringa is presumed scarce. This section provides answer to research question relating to objective 1 of the study.

Table 4.3: Years of Awareness on Moringa Cultivation and Utilisation

No of Years	Frequency		Average %	Mean
	IKOLE	**GBOYIN**		
1-4	65 (67.0)	51 (56.0)	61.8	**4.1**
5-8	25 (25.8)	20 (22.0)	23.9	
9-12	4 (4.1)	9 (9.3)	6.9	
13-16	1 (1.03)	0	0.5	
> 16	0	2 (2.2)	1.1	
No response	2 (2.1)	9 (9.3)	5.9	

Field Data from Ikole and Gboyin LGAs Assessment 2015

Key: figures in parenthesis are also percentages

4.3.1 Farmers' Years of Awareness about *Moringa oleifera* Cultivation and Utilisation

Table 4.3 shows the distribution of respondents according to their years of involvement with Moringa cultivation and utilisation. Most of the respondents from the two local governments have between 1-4years experience on planting and using Moringa (representing 67.0% in Ikole LGA and 56.0% in Gboyin LGA). 25.8% and 22.0% of the sampled population in Ikole and Gboyin LGAs have 5-8years while 4.1% and 9.3% respondents in the two respective LGAs have 9-12years awareness on Moringa. Only 1.0% of the population have more than 12years of knowledge and experience on Moringa cultivation and utilisation in Ikole LGA.

It is evident from this result that majority of the respondents from the two local government areas became aware of Moringa cultivation and utilisation just four years ago. This implies low level of awareness and possible limitation on its utilisation and capacity to

enhance economic empowerment. It is the belief of the researcher that there is need to appraise and maximise every available communication tool to bring about more awareness on Moringa potentials which will inform more people on its cultivation and utilisation.

It is thus clear that many of the respondents became aware and started cultivating and using Moringa based on information they received and persuasion from friends, families and people. It indicates that interpersonal communication plays a big role in channelling information about Moringa. Indeed, interpersonal communication has a role to play in human development. Reinforcing this position, Frydrychowicz (2005) corroborates that development thrives on closeness and trust, but should include all the dimensions of communication: information, joint activity/participation and establishing relationship. Simultaneous application of these dimensions in appropriate proportions can give rise to the desired closeness, trust and independence and certainly determines the effectiveness of the process of interpersonal communication.

4.3.2 Awareness on Purpose for which Moringa is used by Respondents

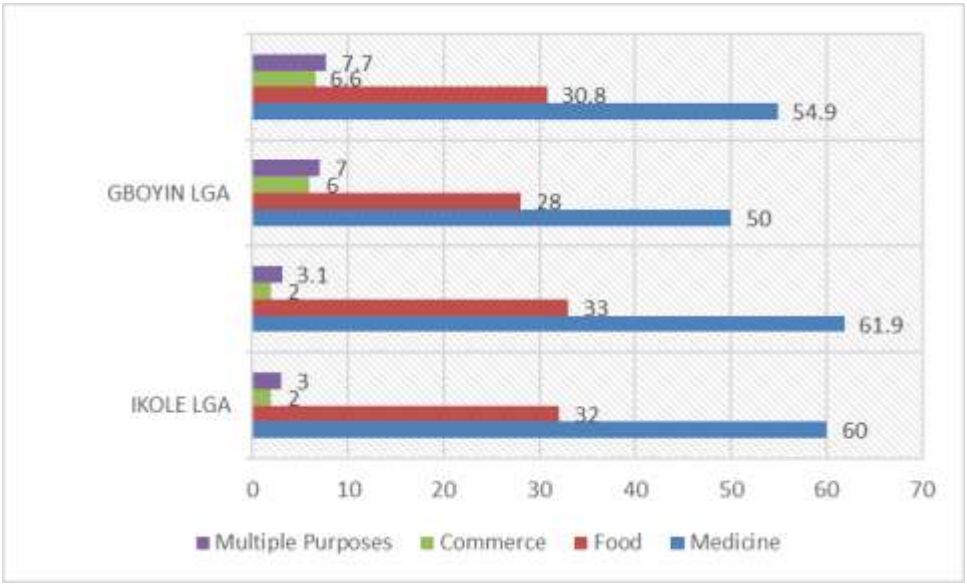


Fig 4.1: Respondents' Awareness of Various Application/Uses of Moringa

In fig 4.1 above, the respondents in the two local government areas were aware of three purposes of which Moringa is used for. These purposes are medicine, food, and

commerce, while some population were also aware of possibility of combining these three purposes. From the result, 61.9% and 54.9% of the respondents in Ikole LGA and Gboyin LGAs are respectively aware of the medicinal use of Moringa. As food, 33% of the respondents in Ikole LGA and 30.8% in Gboyin LGA are aware and use it for food purpose. 2% and 6.6% of the population respectively from Ikole and Gboyin LGAs have knowledge of its commercial potential. Whereas 3.1% and 7.7% of the repondents from Ikole and Gboyin LGAs are aware that these purposes can be combined to achieve empowerment. This data clearly shows that more respondents in Gboyin LGA are aware of various utilisation of Moringa than in Ikole LGA.

It was outstanding from the data that medicinal purpose is more important to majority of the respondents in Ikole and Gboyin LGAs. This thus buttressed the statement of Palwal *et al*., (2011) that from time immemorial man has remained dependent on plants for medicine. From a historical perspective, it is evident that the fascination for plants is as old as mankind itself. The plant kingdom represents a rich storehouse of traditional medicine and organic compounds that may lead to development of novel agents for various disorders. There is no doubt that Moringa potential as a medicinal plant is now becoming a phenomenon all over the world and various research findings have ascertained its efficacy to heal several diseases and ailments (Anwar *et al.,* 2007). This thus ascertain the statement of **Key Informant I** who has this to say:

> I heard about it first from a friend, and then it was Moringa powder that I was introduced to. I also went ahead to search the internet to know more about the plant. I learnt it is a gift and blessings from God to mankind. It alleviates several health challenges and diseases. I presently market some Moringa products especially the leaf powder. I sell it to friends, people in general and I also use it myself. (*Researcher's interview with Mr Yusuf Olajide from Ode Ekiti* in Gboyin LGA *on September 15, 2015*)

This is further corroborated by this assertion from **Key Informant III:**

> I knew it through a friend about six years ago. Since then I have been using Moringa to cure headache, stomach ache and issue of clear vision. I also use it for my children.

(*Researcher's interview with Mrs Kemi Bakare from Aisegba Ekiti* in Gboyin LGA *on September 17, 2015)*

Moringa. oleifera is very important for its medicinal value. Various parts of this plant such as the leaves, roots, seeds, barks, fruits, flowers and immature pods act as cardiac and circulatory stimulants, possess antitumor, antipyretic, antiepileptic, anti-inflammatory, antiulcer, antispasmodic, diuretic antihypertensive, cholesterol lowering, antioxidant, antidiabetic, antibacterial and antifungal activities, and are being employed for the treatment of different ailments in the indigenous system of medicine, particularly in South Asia (Farooq *et al*., 2007). The researcher's further interview of respondents within the study area also buttressed the importance of *Moringa oleifera* and its healing power as follows:

> I travelled sometimes ago and I became ill. I took some medications but there was no improvement. Then someone introduced the plant to me. Though the plant was familiar because I used to see it around but never considered it to have healing power. I took it as was recommended and I became alright. I have few stands of Moringa plant now in my farm. *(a testimonial statement of Mr Obale Emmanuel, interviewed at Ode-Ekiti in Gboyin LGA by the Researcher on September 17, 2015)*

In addition to above testimonial on Moringa, another respondent from Ikole LGA has this to say:

> There was a time I used to have my stomach peppering me, I thought it was ulcer but the Doctor said it was not. My Doctor introduced Moringa leaf to me and since then I have been taking it. I no longer experience the problem again. I also introduced the plant to a neighbour who had similar experience and it worked for her too (*An interview with Mrs Felicia Oladokun at Odo Oro in Ikole LGA on September 18, 2015*).

Food is the second important purpose that respondents use Moringa for. 33.0% and 30.8% of respondents in Ikole and Gboyin LGAs are respectively aware of Moringa as a food or food supplement and are using it for that purpose. Moringa is especially promising as a food source in the tropics because the tree is in full leaf at the end of the dry season when other foods are typically scarce (Fahey, 2005). The researcher observed that the use of Moringa as food in the study area still have undertone of its medicinal value as reason for taking it as food.

The use of Moringa for commercial purpose is still minimal and not significant. This indeed speaks volume of the need to promote its potentials in the study area. It is therefore evident that the people of Ekiti State are yet to appropriate the potentials of Moringa plant on a large scale. The researcher noticed that at individual level, people's usage of Moringa is still subsistent. This thus clearly inform the position of a respondent who sees the need to explore the potential of *Moringa oleifera* to better the life of people in the study area and bring about sustainable development in this expression below:

> I noticed that people do not place high premium and importance on Moringa plant. The government can promote its importance by including it in agricultural project through establishment of large plantation of Moringa, recommending it as legal alternative medicine for our hospitals and promoting it in such regular events like trade fare. (*an interview with Mrs Felicia Oladokun at Odo Oro in Ikole LGA on September 18, 2015*)

4.3.3 Analysis of Moringa Availability Awareness

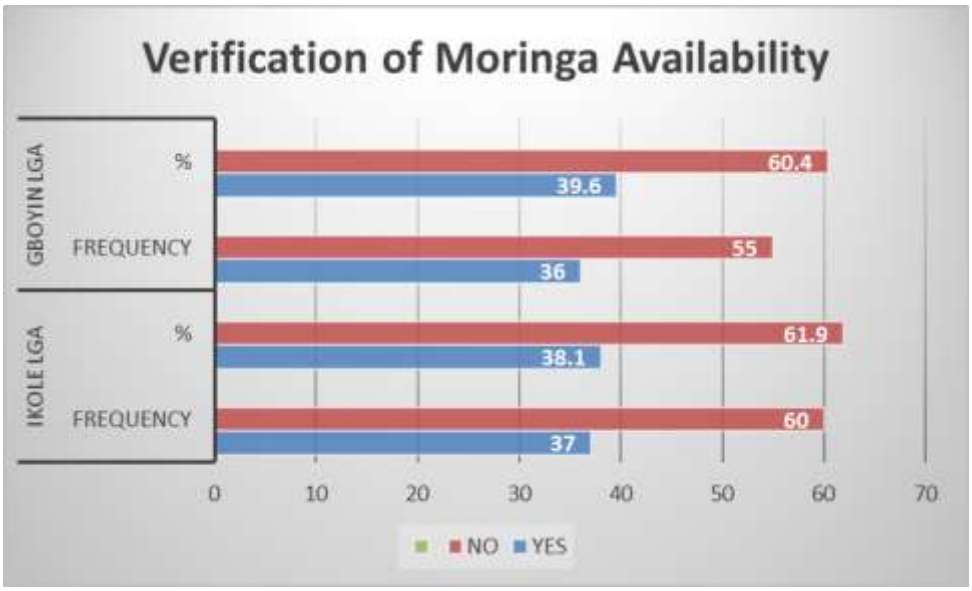


Fig 4.2: Respondents' Awareness of Moringa Availabity

More respondents agreed that they are aware that Moringa plants are always available all the year round. This population is represented by 60.4% of the respondents in Gboyin LGA and 61.9% in Ikole LGA according to fig 2 above. This could be supported by the facts

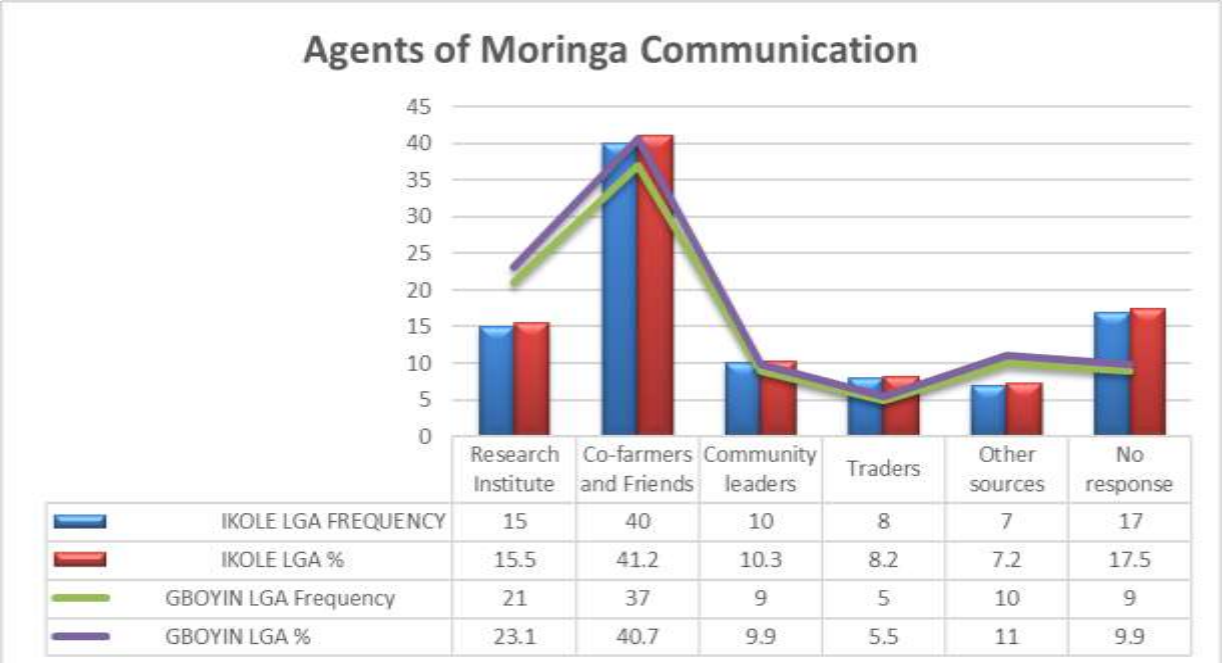
from research findings that Moringa is a resilient plant that can withstand drought, and when consideration of Ekiti State fauna and flora is expressed, it is certain that Moringa will be available all year round because rainfall is quite elongated within the area. Ekiti State has a total annual rainfall of about 1400mm and with an average of about 112 rainy days per annum (Adebayo, 1993).

The awareness level on Moringa cultivation and utilisation of the local government areas under study in Ekiti is still low and the know how about it is more centred on the literate population of the area. This in turn implies that the information is still more circulated amidst the elite of the study area. This informs the need to bring it to the people who could not access internet, do not speak English and are limited to an extent is now a necessity if the potentials of Moringa value chain is to be achieved. At present in the study area, Moringa is more seen as useful as food condiments, whether at dried or fresh stage and for medicinal purposes. The available information of Moringa vast potentials for such uses as oil, fertilizer, ornamental purpose, water purifier, biogas is unknown to many of the respondents. This implies that creating awareness on potentials of Moringa through effective communication is now an emerging and feasible reality.

4.4 Sources of Information on Moringa Cultivation and Utilisation

Information plays a critical role in any human endeavour and how this information is sourced is no less important. The present era, also known as the information era, requires creation of information expressway interlinking farmers, markets, corporate bodies, agricultural scientists, and buyers of agricultural products. This may help producers to realize maximum share from the price paid by end consumer. This section thus looks at various sources through which respondents became informed about Moringa cultivation and utilisation by looking at the channels, and how the respondents see their reliability and trend. It provides holistic outlook to second objective of this study.

4.4.1 Channels through which Respondents adopted Moringa Cultivation and Utilisation



	Research Institute	Co-farmers and Friends	Community leaders	Traders	Other sources	No response
IKOLE LGA FREQUENCY	15	40	10	8	7	17
IKOLE LGA %	15.5	41.2	10.3	8.2	7.2	17.5
GBOYIN LGA Frequency	21	37	9	5	10	9
GBOYIN LGA %	23.1	40.7	9.9	5.5	11	9.9

Fig 4.3: Channels of Adopting Moringa Cultivation and Utilisation

From the data analysed as shown in fig 4.3 above, research institutes, co-farmers and friends, community leaders, traders and other sources were identified as channels through which respondents were convinced to start cultivation and utilisation of Moringa plant in the

two LGAs. 41.2% and 40.7% respondents in Ikole and Gboyin LGAs respectively got their information through co-farmers and friends.

Also from the above data, some respondents in Gboyin LGA than Ikole LGA posited that Research Institute could play a vital role in communication Moringa cultivation and utilisation to them (23.1% in Gboyin LGA and 15.5% in Ikole LGA). There was no significant difference in number of people from the two LGAs that sees community leader as a veritable tool in communicating Moringa cultivation and utilisation (10.3% in Ikole LGA and 9.9% in Gboyin LGA). 7.2% of the population in Ikole LGA sees traders as an agent of Moringa communication whereas 11.0% subscribed to that in Gboyin LGA. Other sources such as government agencies, extension agents, NGOs, media were also identified by the respondents representing 7.2% in Ikole LGA and 11.0% in Gboyin LGA. In the researcher opinion, Traders and Community leaders of course are likely to communicate through interpersonal means in most cases whereas the Research Institute may use conventional communication process.

There is no visible market channel whether informal or organised that could be pin pointed to Moringa. This is indeed true because majority of the population that are into Moringa cultivation and utilisation are not connecting yet to the significant reality of what can be accrued from potentials of Moringa economically. What most is presently subscribing to is a subsistent purpose of utilisation of Moringa parts; However, few that had ventured into its cultivation, processing and marketing were discouraged by unfriendly situations such as; unavailable market due to absence of Government policy and participation.

It is evident that most of the respondents were introduced to Moringa through informal interpersonal means. The researcher in a discussion with **Key Informant II** discovered that information on Moringa is easily transferred from one person to another as stated here:

> I went to Ilorin to take care of my grandchild when I saw the plant at the backyard of my son's house. I had to ask what sort of plant is this with such a long pod. I was informed it is Moringa. My son later gave me a seed to eat which indeed tasted nice and sweet. I was there for two weeks and took the seeds for the length of that time and I felt its work in my body. I had to take some seeds back with me to Ekiti which I later planted in my house. Since then I have been taking it and also introduced it to my group of herbal medicine seller where I am the Chairlady. (*Researcher's interview with Madam Nimota Adeleye on September 16, 2015 at Ikole Ekiti in Ikole LGA*)

There is a strong evidence that interpersonal communication was a major means through which people in the study area were informed about Moringa plant. However, in the course of discussion with one of the key Informant, this view was added as stated below:

> Interpersonal communication will go a long way to help in communicating Moringa, but use of mass media will achieve better results especially radio and television because of their wide coverage and potential to reach many people. Not everybody has access to newspaper. Other avenues are pamphlets, which could be used, through extension agents, health workers and local governments. *(Researcher's interview with Mr Mathew Ajayi, an Extention staff of Ikole LG on September 16, 2015 at Ikole Ekiti in Ikole LGA)*

The researcher infers through his observation that the interplay of these sources will go a long way to sustain Moringa cultivation and utilisation. Although agricultural departments exist in the two local governments, the essence and importance of Extension work in respect of Moringa cultivation have not been defined and executed in the area. It is evident from the responses of the people interviewed that other sources such as Extension agents and cooperative society have a role to play in information dissemination and creating proper awareness about Moringa cultivation and utilisation.

Structures such as cooperatives, NGOs, religious organisations, traditional institutes and other societal groups' participation in the communication of Moringa potentials were noticed to be missing in the study area. There active participation in the Moringa communication will give credence to role of society and duality mechanisms of structuration theory as suggested by Giddens (1989) to take communicating Moringa value chain to the next level of empowering the society. As Giddens puts it, 'Society only has form, and that form only has effects on people, in so far as structure is produced and reproduced in what

people do' (Giddens & Pierson, 1998). It is therefore pertinent that Moringa information sourcing will become more reliable and sustainable when all channels are interacting in the manner Giddens postulated since they tend to serve as the structures necessary to enable flow of information across board and strata.

Giddens's theory of structuration notes that social life is more than random individual acts, but is not merely determined by social forces. To put it another way, it is not merely a mass of 'micro'-level activity - but on the other hand, you cannot study it by only looking for 'macro'-level explanations. Instead, Giddens suggests, human agency and social structure are in a relationship with each other, and it is the repetition of the acts of individual agents which reproduces the structure. This means that there is a social structure - traditions, institutions, moral codes, and established ways of doing things; but it also means that these can be changed when people start to ignore them, replace them, or reproduce them differently

4.5 Challenges of Effective Communication of Moringa Cultivation and Utilisation

This objective looks at various factors that militate against proper communication of Moringa cultivation and utilisation. It also determines the severity of these factors based on respondents' perception. This section attempts to answer research question hinged on third objective of this dissertation.

4.5.1 Challenges Facing Moringa Value Communication

Table 4.4: Ranking of Factors that affect Moringa Value Communication

	IKOLE LGA		GBOYIN LGA	
VARIABLES	**Score**	**Ranking**	**Score**	**Ranking**
AWARENESS	3.50	1st	3.46	1st
MARKET	3.47	2nd	3.45	2nd
INFORMATION	3.47	2nd	3.41	3rd
STORAGE	3.29	4th	3.16	4th
LAND USE	3.26	5th	2.90	5th
MIDDLEMEN	2.89	6th	2.86	6th
ADULTERATION	2.82	7th	2.86	6th
COST	2.82	7th	2.70	8th
SECURITY	2.62	9th	2.58	9th

Source: Field Data from Ikole and Gboyin LGAs Assessment 2015

Based on Respondents' perception of various factors that could affect people being empowered through Moringa value chain as listed in table 4.4, it is evident that awareness has the highest grade of 3.5 on a 5-point grade in Ikole LGA and 3.46 in Gboyin LGA. Awareness was noted as the most important issue that is challenging people being empowered. The level of awareness is critical to maximising Moringa potentials. Different information sources reach different audiences, and awareness is created if messages are reinforced by appropriate communication channels**.** The word communication is somehow abstract and possesses numerous meanings. Awareness is therefore an important aspect of co-

opting people into cultivation and utilization of Moringa and this is only achievable via a laudable communication process. In this light, the researcher's interview with the Key Informant 1 supported this notion as follows:

> In Ekiti state the awareness level of people on Moringa cultivation and utilisation is not on the highest level expected, though it seems a lot of people in Ekiti have heard about it; even plant it around their houses but so many just to do that without really appropriating its real usefulness and potentials to the fullest. (*Researcher's interview with Mr Yusuf Olajide on September 15, 2015 at Ode Ekiti in Gboyin LGA*)

Two other factors which majority of the respondents considered as a constraint to Moringa communication is the unavailable market and necessary information to create one. These two factors have 3.47 each in Ikole LGA, thus taking the second position and have 3.45 and 3.41 respectively in Gboyin LGA for 2nd and 3rd position respectively in ranking. Market has been understood as an actual or nominal place where forces of demand and supply operate, and where buyers and sellers interact (directly or through intermediaries) to trade goods, services, or contracts for money or batter. In essence elements of communication are necessary for market to be established. Indeed, this factor is critical if any meaningful development is expected in respect of Moringa as a source of empowerment in Ekiti State.

Also from table 4 above, Storage, Land use, Middlemen, Adulteration, Cost and Security are scored respectively 4th, 5th, 6th, 7th, 8th and 9th position in the same manner in the two LGAs under study. They were also seen as a contributory factor that could negate Moringa communication if not properly considered as important. All the factors scored above average point of 2.5 and this implies they are all significant factors that affect Moringa communication for empowerment.

In production, research, retail and accounting, a cost is the value of money that has been used up to produce something. Though this was seen as less threatening factors by the respondents, it is invariably clear that communication itself is cost implicative because it involves effort, material, resources, time and utilities. Respondents also see information as a

key factor that affect proper communication of Moringa value chain. Information is the knowledge communicated or received concerning a particular fact, circumstance or news. In essence the authenticity of an information can act as a stimuli or otherwise. And where there is shortfall of valuable information, development in sustainable term is greatly hindered.

The essence of the discussion the researcher had with the **Key Informant IV** further sees challenges in this frame:

> There are challenges to realising Moringa potentials. Two of such problems are illiteracy and lack of fund. Illiteracy is a problem in the sense that it becomes difficult to convince people to utilise it due to their level of education. A lot of people also complain of lack of fund which is indeed essential to carry out any meaningful empowerment project. (*Researcher's interview with Mrs Kemi Bakare on September 15, 2015 at Aisegba Ekiti in Gboyin LGA*)

She further suggested that government should provide soft loan for farmers so as to acquire more land for planting Moringa. Also information dissemination through mass media to enlighten people about Moringa potentials can go a long way to create more awareness and people acceptance of Moringa. A woman who chatted with the researcher in Ikole town lamented the woes of her father who ventured into planting Moringa on a cultivation scale but today could not see market for the seeds. Indeed, vital information on market availability and accessibility is an issue that need to be addressed if the empowerment potentials of Moringa will be actualised. The observable inferences from the field showed critically that no single established market or trade line was visible for Moringa. What is seen is interpersonal interaction which most of the time is free and seasonal selling in weekly market. Thus the need for a sustainable market chain is now emerging.

4.6 Assessment of Information on Potentials of Moringa Value Chain in Empowering the Local Communities in the Study Area

This section investigates whether people of the study area sees prospect in Moringa as a plant with potentials to empower them, level of their knowledge of Moringa capacities and how it can be used to achieve empowerment. In essence, it provides template to harness the fifth objective of this study.

4.5.1 Moringa Potentials in Empowerment Programme

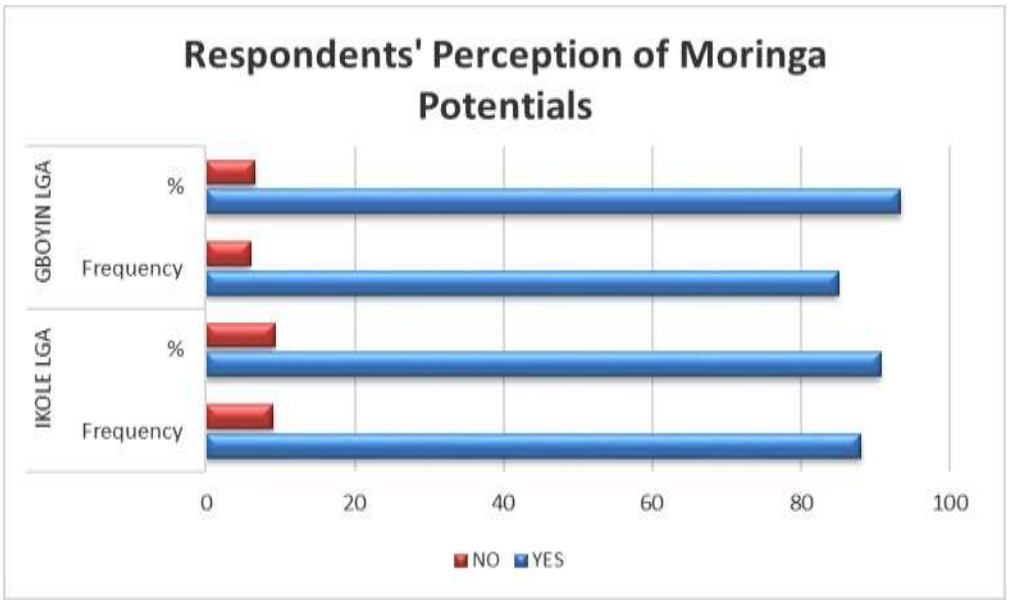


Fig 4.4: Frequency of Reality of Moringa Potentials

From fig 6 above, 90.7% and 93.4% of the respondents from Ikole and Gboyin LGAs respectively, adduced to the fact that Moringa plant with its numerous value chains have potentials to empower people. They argued that Moringa can open up employment opportunities when its markets become open and available. However, it was observed that most of the people the researcher came across outside the respondents have low awareness of Moringa usefulness for agricultural development and as industrial natural resources. There is no doubt however that majority of the respondents are versed with its medicinal prowess and uses. In the word of **Key Informant III**, the Information officer of Gboyin Local

Government, she highlights the interest of the local government to empower the populace especially the youths in this sense:

> The State Government under the leadership of Governor Ayodele Fayose has Agriculture and Youth empowerment as part of its cardinal agenda for the state. Recently about 300 youths from Gboyin local Government benefited from the youth empowerment scheme at Orin Ekiti. The local Government on its own has earmarked 30 hectares of land for distribution to youth in the locality for agricultural purposes. Moringa cultivation is also included in the plan of the local government for this year. Before now, some agricultural experts were invited from State level to educate farmers on how to cultivate Moringa and utilise it for economic benefits. (*Researcher's interview with Mrs Bimbo Yusuf on September 16, 2015 at Aisegba Ekiti in Gboyin LGA)*

Though the above statement tends to create a positive outlook at Gboyin Local Government, the story was not the same at Ikole LGA, where the researcher interacted with the Chairman of the Local Government. It is interesting to note that she is quite aware of the Moringa plant and uses it for food; that utilisation is in fact limited only to her and her household. The outcome of the interaction is the resolution of the chairperson to create an enabling environment by organising a seminar where all stakeholders in agricultural practises in the local government will be exposed to potentials of Moringa plant and how it can improve their livelihood. Thus, opinion leaders, and key personalities within a community have a big role to play in empowerment campaign and mobilising people to execute such. This therefore corroborated the assertion of Ozor and Nwankwo (2008) that to help bring a rural community to action, it is necessary for individuals and groups to provide good leadership. When good leadership is provided, the people participate voluntarily in the accomplishment of stated objectives.

The approach to rural community development is always through local leaders who not only act as pioneers of projects but also help in influencing and motivating their people to action. For any rural community development to be successful, influential local leaders must be involved else they might undermine the progress of such programmes. Therefore, any agency or organization coming up with a development programme for the community must

initially have a discourse with these influential local leaders, a process otherwise referred to as legitimization.

Further still, **Key Informant II**, a local herbal medicine seller in Ikole suggestion on actualising Moringa potentials is worth mentioning here:

> The government should help especially in the medical sense to see how Moringa plant can be converted to valuable products that will be available to everybody. Look at ginger on my stand, it has now been produced as tablet and sweet for everybody's use. Moringa can also be given this kind of value addition. (*Researcher's interview with Madam Nimota Adeleye on September 16, 2015 at Ikole Ekiti in Ikole LGA*)

Empowerment has been defined according to two distinct characteristics, "both the actual ability to control one's environment (external empowerment) and the feeling that one can do so (internal empowerment) (Deiner and Biswas-Deiner 2005). According to this thinking, holistic empowerment cannot be attained without attention to both of these dynamics. For Moringa cultivation and utilisation to achieve its potentials of empowering people of the study area, there is need for both dynamics to work in synergy. It implies the people themselves must show readiness to cultivate and utilize Moringa, Government creating conducive environment for those desires of the people to work and societal agencies playing the stimulating roles as elaborated by Giddens in structuration theory.

In the word of **Key Informant V**, empowerment through Moringa implies need assessment and holistic evaluation of opportunities and cost as stated here:

> Looking at the importance of the plant, we need to use our knowledge, experience and education. The youths need to explore the internet first and seek information on how to go about Moringa business. Who are the people that need Moringa? How can it be marketed? And where the plant can be sold to. These questions have to be answered before going into the production. You can't plant without this information. Pharmaceutical industries are looking for it. So, we can go through them. What quantities are they looking for? In summary, there is need to do market survey and know all the opportunities available for the business (*Researcher's interview with Mr Mathew Ajayi on September 16, 2015 at Ikole LGA headquarter).*

From the general views of the respondents and observable inferences, the researcher discovered that funding is a critical issue and information on how to go about Moringa business is lacking. The outcome infers that people of the area can become empowered by

going into Moringa plantation through individual creativity, group farming cooperative and government supports in funding, provision of conducive environment and land availability, and market for the produce. Impact of government and its agencies in dispensation of information relevant for Moringa cultivation and utilisation in the study area is indeed at a minimal level. No single policy statement or programme could be identified that include Moringa cultivation and utilisation. This is a serious setback for any individual that wants to involve in this business. Implication of this is that people are left out to decide what goes on in Moringa value chain. Government presence and support is a critical factor if any meaningful result and progress is expected in respect of Moringa utilisation for empowerment process and sustainability of livelihood.

It was vivid from various interactions and observable inferences that people of the study area want to know more about Moringa potentials and what benefits they can get from subscribing to its cultivation and utilisation. There is a growing reality that the people of the study area are in a dire need of improving their livelihood. Apart from government establishment which is the highest employing agency in the land, there is hardly any viable microbusiness that could be identified apart from self-own enterprises and farming which are the main stay. Moringa value chain is a reality that could offer this opportunity.

There is no doubt that Ekiti state is blessed with arable land, wonderful forest environment and abundant rainfall that can support plantation of Moringa. Many farmers are involved in Taungya farming system of Agroforestry whereby tree crops are planted in between arable crops until the trees becomes established. Whereas if Moringa is experimented for the same purpose it will keep the farmers on the same land for as many years more feasible than what the tree crops which are limited overtime could do. This is a reality that needs to be appropriated in the study area. More so, abundant rainfall of the area can keep Moringa availability for the whole year in productive sense.

4.7 Effective Communication of Moringa Cultivation and Utilisation

Effective Communication is not merely concerned with providing information on development activities. It also implies creating an atmosphere for understanding how new ideas fit into the real social situation in which the people operate. Its ultimate goal is to catalyse local development activities, local development planning and implementation, and local communication to smoothen the path to development. This section which provides in-depth information on second objective of the study therefore looks at those tools that can be used to achieve effective communication of Moringa cultivation and utilisation to the people. It also looks at indices which the respondents perceived could aid effective communication of Moringa value chain. Thus providing clues to objective 5 of the study.

4.7.1 Respondents perspective of effectiveness of communicating tools for Moringa Cultivation and Utilisation

Table 4.5: Rankings of Tools for Communicating Moringa Cultivation and Utilisation

VARIABLE	IKOLE LGA		GBOYIN GLA	
	Score	**Ranking**	**Score**	**Ranking**
ORAL INFORMATION	6.36	1st	6.32	1st
RADIO	6.18	2nd	6.20	2nd
TELEVISION	5.80	3rd	6.00	3rd
INTERNET	5.16	4th	5.34	4th
WORKSHOP	5.00	5th	4.88	5th
NEWSPAPER	4.65	6th	4.35	6th
PHONE	4.49	7th	4.27	7th
PICTURES	4.10	8th	4.18	8th
VIDEO	3.60	9th	4.06	9th

Source: Field data from Ikole and Gboyin LGA 2015

Table 4.5 highlights how each tool performed in ranking of 10-point grade. Based on assessment of the respondents on tools that could be used to communicate Moringa

cultivation and utilisation, oral information, radio, television and internet were scored above average in the Ikole and Gboyin LGAs, which implies their effectiveness. It was evident that oral information which is the hallmark of interpersonal communication was adjudged with highest mark and ranked first in the two LGAs. This expressly symbolises the importance of interpersonal relationship at social cycle across the strata of the society especially in the study area. From a 10-point score grade, the respondents in both Ikole and Gboyin LGAs rated Oral Information, Radio, Television and Internet and Workshop **5 points** and above as tools that can be used to achieve effective communication of Moringa cultivation and utilisation.

Other tools including newspaper, phones, pictures and videos scored less than 5 point in the two LGAs implying that the respondents do not see them as significant in effective communication of Moringa like those tools initially mentioned. The researcher believes that Mass Media effectiveness cannot be overemphasised based on their rankings in the two LGAs as follows; radio (2^{nd} position), television (3^{rd} position), although newspaper took 6^{th} position. Internet taking 4^{th} position implies that the digital world is fast catching up with the study area. The significance of these findings is that communication has a role to play in propagating Moringa cultivation and utilisation not only in Ekiti State but in Nigeria as whole. Therefore, for sustainable development of Moringa cultivation and utilisation, there is a need for close collaboration between development agents and traditional and rural communicators to revive or strengthen the traditional communication system for making optimal use of its interactive power to stimulate peoples' participation which is the essence of development communication.

4.7.2 Perspectives on Factors that affect Effective Communication of Moringa Value Chain in Ikole and Gboyin Local Government

Table 4.6: Respondents' Perceptions of Indices that affect Effective Communication of Moringa Value Chain

INDICES	SA	A	N	D	SD
Information through the new media from Government has helped farmers to be aware of how to produce and sustain Moringa farming	***30 (30.9)***	***40 (41.2)***	***20 (20.6)***	***2 (2.1)***	***5 (5.2)***
	24 (26.4)	47 (51.6)	15 (16.5)	4 (4.4)	-
Demonstration through field school by Research Institute is most appropriate	***25 (25.7)***	***33 (34.0)***	***23 (23.7)***	***15 (15.5)***	***1 (1.0)***
	22 (24.2)	46 (50.5)	20 (21.9)	3 (3.3)	-
Interpersonal communication directly with the farmers is key to sustenance	***31 (32.0)***	***40 (41.2)***	***20 (20.6)***	***6 (6.2)***	***-***
	30 (33.0)	36 (39.6)	19 (20.9)	4 (4.4)	2 (2.2)
Feedback mechanism using the extension agents alone is enough for farmers'' sustenance	***20 (20.6)***	***29 (29.9)***	**27 (27.8)**	***15 (15.5)***	***6 (6.2)***
	12 (13.2)	23 (25.3)	30 (33.0)	21 (23.1)	5 (5.5)
Direct information from the government is enough to cause revolution of Moringa production	***19 (19.6)***	***21 (21.6)***	***33 (34.0)***	***20 (20.6)***	***4 (4.1)***
	17 (18.7)	20 (22.0)	26 (28.6)	22 (24.2)	6 (6.6)
Regular shows on TV, radio advertorials and newspaper news are adequate to help farmers sustain Moringa cultivation and utilisation	***34 (28.7)***	***36 (36.2)***	***22 (26.1)***	***2 (2.1)***	***3 (3.1)***
	20 (21.9)	32 (35.2)	27 (29.7)	6 (6.6)	6 (6.6)
Research publications, journals when made available to farmers can aid	***18 (19.8)***	***38 (39.2)***	***30 (30.9)***	***5 (5.2)***	***6 (6.2)***
	23 (25.3)	35 (38.5)	27 (29.7)	4 (4.4)	2 (2.2)
No single channel of information is enough to cause sustainability in respect of Moringa cultivation and utilisation	***21 (21.6)***	***28 (28.9)***	***26 (26.8)***	***12 (12.4)***	***10(10.03)***
	20 (22.0)	29 (31.9)	27 (29.7)	8 (8.8)	7 (7.7)
There is need to provide conducive environment for flow of information for sustainability to be achieved	***27 (27.8)***	***42 (43.3)***	***25 (25.8)***	***2 (2.1)***	***1 (1.0)***
	27 (29.7)	41 (45.1)	22 (24.2)	1 (1.1)	-
Indigenous communications that are peculiar to farmers have a major role to play in sustainability of Moringa cultivation and utilisation	***29 (29.9)***	***44 (45.4)***	***20 (20.6)***	***3 (3.1)***	**2 (2.1)**
	24 (24.7)	32 (35.2)	30 (33.0)	2 (2.2)	2 (2.2)

Source: Field Data from Ikole and Gboyin LGA Assessment 2015
Key: Figures in parenthesis are percentages
Figures in bold font represent data from Ikole LGA while figures in light font represent data from Gboyin LGA

72.1% respondents in Ikole LGA and 78.0% in Gboyin LGA agree that information through the new media from Government will help farmers to be aware of how to produce

and sustain Moringa farming. 59.7% and 70.5% respectively from Ikole and Gboyin LGAs perceived that demonstration through field school by Research Institute is appropriate for this purpose. 73.2% in Ikole LGA and 72.6% in Gboyin LGA see interpersonal communication directly with the farmers as key to sustenance of Moringa cultivation and utilisation. Respondents from the two LGAs represented by 63.9% and 57.1% agreed that regular shows on TV, radio advertorials and newspaper news could help farmers to sustain Moringa cultivation and utilisation. An average population representing 50.7% and 53.9% in Ikole and Gboyin LGAs respectively agreed that no single channel of information is enough to cause sustainability in respect of Moringa cultivation and utilisation.

Respondents' perceptions of various indices listed in Table 6 show majority agreeing that each index affect the effectiveness of communicating properly Moringa value chain. However, majority of the respondents in the two LGAs (71.1% in Ikole and 74.8% in Gboyin) see the need to provide conducive environment for flow of information for sustainability to be achieved, whereas 75.3% in Ikole LGA and above average in Gboyin LGA (59.9%) adduced that indigenous communications that are peculiar to farmers can play a major role in sustainability of Moringa cultivation and utilisation. Another realisation from this data is that not all the respondents see feedback mechanism using the extension agents alone as enough to sustain farmers' cultivation and utilisation of Moringa plant. This is represented by 50.5% in Ikole LGA and 38.5% in Gboyin LGA.

Also, less population of respondents (41.2% in Ikole LGA and 40.7%) see direct information from the government as enough to cause revolution of Moringa production

4.7.3 Role of Indigenous Communication in Moringa Utilisation

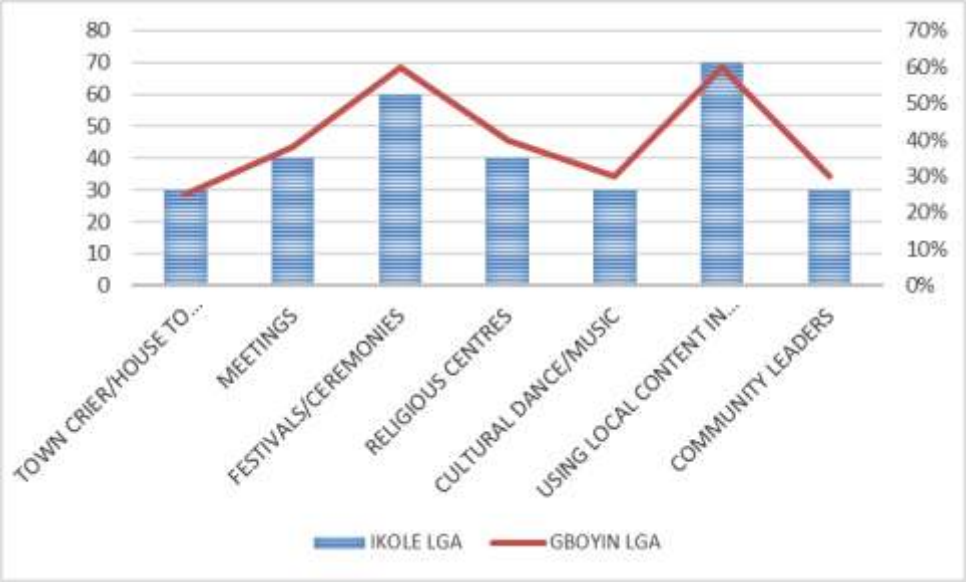


Fig 4.5: Channels of Traditional Communication that can aid Moringa Potentials

Similar results were gotten from Ikole and Gboyin LGAs with majority of the respondents agreeing that indigenous means of communication have a big role to play in Moringa cultivation and utilisation. They suggested that using such avenues as town criers, house to house interaction (30% for both LGAs), meetings such as family meeting, clan meetings, age group gatherings and other social events (40% for both LGAs), religious gatherings and celebrations, festivals such as burial, traditional rites, marriage, burial, chieftaincy, using local languages and contents in the mass media and community leaders approach are some of the channels that are indigenous which the respondents in both Ikole and Gboyin LGA adduced could promote Moringa cultivation and utilisation. However as shown in figure 4.5 above, the majority of the respondents in the two LGAs subscribed to festivals (60% in Ikole LGA and 70% in Gboyin LGA) and using local content in media (70% in the two LGAs) as most veritable. It was observed from the result that the responses from the two LGAs were similar and related.

It was observed by the researcher that the study area is rich in traditional means of communication which could become the needed catalyst for communicating Moringa potentials. For instance, in Ikole Ekiti, (the local Government Headquarters), it was observed that people dance around the town when observing such festive as burial. The children of the deceased were seen dancing around with a picture of their deceased person being shown to the world. The procession is always followed by mass of observers, sympathisers and musical train. This informs the whole town about the death. An interesting experience was that even a lady that graduated as a Fashion designer also did same using her certificate in place of a picture. Such informal communication can play a vital role in informing people about Moringa value chains and stimulate people to experiment one or more of Moringa diverse potentials.

The expected linkages and connections expected amongst various identified channels of communication are presently not visible in the study area. This is indicative of why flow of information necessary to create enabling environment for popular participation of the populace in various activities that connect to Moringa value chain is still not visible at the study area. Interpersonal communication of Moringa potentials was identified as significant in the study area. Mass media effect of creating awareness on Moringa utilisation is not yet experienced in the study area. Therefore, the need to synergise this especially with mass media is a strategic factor that can bring about a paradigm shift in the knowledge sharing of the population and capacity to popularise its cultivation and utilisation.

4.8 Inference on Moringa Cultivation and Utilisation in Ikole and Gboyin LGAs of Ekiti State

The socioeconomic characteristics of the respondents reveal that the average age of the respondents is 33 which implies the age of youthfulness and productivity. The household size is also moderate at average population of 4 people per family. One striking result is that majority of the respondents are married and none was divorce except few recorded as widows. The year of awareness of respondents at mean value was 4.1 which implies majority have known about Moringa in just about 4 years. This stresses that the level of awareness may still be low in Ekiti State, especially in the study area. Most of the respondents were educated and could be a factor for their knowledge about Moringa.

From people's response to Moringa consumption, above average indicated that they consume it as food. The major purpose why they consume it is because of its medicinal effect which people attested could cure fever, stomach ache, infertility, cough, eye problems and host of other diseases. Thus medicinal value informs the major purpose while people cultivate it. Majority of the respondents own Moringa tree in their farmyard and household through direct planting while very few inherited it as wildings. Based on the torrential rain and forest inclined nature of the study area, the assertions of the respondents that Moringa is available all year round is quite an acceptable discourse that should be capitalised upon. Various channels were identified by the respondents as means through which they become informed about Moringa and later adopted its cultivation and utilisation. The main channels adduced to as responsible were extension workers, co-farmers and friends, research institutes and traders. The reality that most respondents became aware of Moringa through interpersonal communication is indeed unique.

From the data collected, on average, 92% of the respondents agreed that Moringa has unprecedented potentials to empower people of the study area. They see future in its medicinal

value, food and nutrition purposes. It was also observed by the researcher that the people are willing to actualise this reality if enabling and encouraging atmosphere needed is provided. The respondents however expressed concern that actualisation of Moringa potentials is being threatened by so many factors which were identified as follows; security, awareness, land availability, market availability, capital, government support etc. They unequivocally agreed that awareness is a major problem that needs to be contained. They assert that the level of awareness is still low and that resolving that will go a long way to rub on other issues positively.

Various suggestions were made by respondents as a way of getting out of the present status of Moringa in the study area; from Government direct support in form of loan provision, infrastructural development, market creation, friendly policy formulation in respect of Moringa and other necessary actions of the state to other provisions such as comprehensive action plan that place information dissemination at fore front using mass media and other channels of communication. They agreed that the need to involve all stakeholders, right from the least to the highest is a necessity and should be appropriated judiciously.

The inferences from the structured questionnaire, interviews and direct observations of the researcher showed the present cultivation and utilisation of Moringa as it concerned the study area still at novel stage. The cultivation among farmers is on subsistent nature of planting some trees as hedges around their farms and as shade in front of their houses. The researcher was informed that the only Moringa farm at commercial quantity is only situated at Afe Babalola University in Ado Ekiti. It is therefore evident that opportunities abound if proper promotion of the plant is carried out. Some respondents said people are sceptical and are short of information on how to go about mass plantation of the plant. They also opined that issue of marketing Moringa is of great concern, since presently no regulated market is visible in Ekiti State.

From the result, people are already using Moringa for food delicacies, tea and as dried powder known in the local parlance as "*Agunmu*" to treat such ailments as high blood pressure, diabetes, headache, stomach disorder and host of other illnesses. However, knowledge of people to the uses of Moringa to make edible oil, fertilizer, feeds for animal, horticulture, biogas and other industrial purposes seem limited. It is therefore glaring to infer that Moringa at present in the study area is being underutilised. This implies that when people get adequate information on how to maximise its usage through effective communication channel.

Intensive Moringa leaf production can lead to green biomass yields at levels which are hard to grasp and even harder to believe. Whether produced for use as a green manure, for livestock feed or for human consumption, it has been already consistently proven that Moringa can be grown intensively with yields of up to 650 metric tons of green matter per hectare even without clonal selection or particular efforts to set records. This compares very well to even the best other green manure crops, such as lablab beans, which yield up to 110 tons/hectare of green matter in pure stands, or to hemp, or even water lillies. These high yields are not theoretical numbers, but actual results. They were obtained in a South-American sub-tropical location.

For small-scale production, Intensive leaf production using beds with 10 cm × 10 cm (4 in × 4 in) spacing may be the most feasible commercial application for the home gardener. For urban lots or small fields, leaf production from trees at 0.75 m × 1 m (2.5 ft × 3.3 ft) spacing is perhaps the best option. Intensive bed production produces very high yield of leaf in a small area, but is not feasible over larger areas because of the high amount of seed needed. Wider spacing at 0.75 m × 1 m (2.5 ft × 3.3 ft) is more feasible for leaf production in lots approaching 0.5 hectare (1.2 ac) and will also provide some pod production (Radovich, 2010). Most of the farmers interviewed in the study area have access to land of 2-4 hectares and so if

furnished with proper information can make livelihoods from Moringa leaf farming only without even venturing to other areas of cultivation.

There is no doubt that Moringa has both local and international prospects. At the local market in the Northern part of Nigeria, where Moringa is a household name, 1kg (2 tiers) of Moringa seeds goes for ₦4,000. Pod yields in India are reported at 19 kg (42 lb) pods/tree/year. This is the equivalent of 31,000 kg/ha (27,600 lb/ac) per year at 2.5 m × 2.5 m (8.2 ft × 8.2 ft) spacing. At 230 pods per tree, pods average 80–90 g (2.8–3.2 oz) each (Radovich, 2010). Using a simple economic analysis, in Ekiti State, it is feasible to have using 3m x 3m spacing, 1000 trees in 1 hectare. Invariably, 1000 trees of Moringa has capacity to produce seeds 10,000kg/ha which in monetary value is equivalent to ₦40,000.000 million. This basic information is indeed not available to many of the farmers interviewed in the study area.

4.9 Communicating Moringa Cultivation and Utilisation

Communicating through farmers' workshop/ Seminar

There should be a parallel relationship between Research Institutes or other stakeholders that have prerequisite information of how to go about planting, sourcing and improving Moringa to the farmers who are the final reservoir of such knowledge and information. One way of achieving this is through farmers' workshop programme or seminar. The extension agent should also play a connecting role at this level. This information sharing could be achieved using such avenues as Field demonstration, Seminars, farm visitation, experiential interaction, interpersonal communication, group discussion etc. Through seminars, Moringa farmers can have access to information on best practices of harvesting, storing and moving the produce from the farm and safety precautions to curtail loss. Designing of such information should be localized to meet the needs of all participants especially the farmers. Such avenues as use of mass media on the part of government agencies, farm visitation by extension agents and use of evaluation tools could also be used to reinforce information derived through this channel.

Communicating through Drama

Moringa cultivation and utilisation can be communicated through dramatic presentation to draw out its importance and the processes to achieve its diverse usages. Drama has been identified as a channel through which development issues can be discussed to a larger forum in a relaxation and serene mood. Various uses of Moringa can also be depicted in a dramatic form. Observable inferences from the field vividly showed that element of drama and fun is embedded in day to day activities of Ekiti people. Thus incorporating drama as a means to promote Moringa cultivation and utilisation will find a good course in the area.

The role of drama in education and communication can best be summed up by a Chinese proverb that says, "*Tell me and I will forget. Show me and I will remember. Involve me and I will understand*." The proverb lays emphasis on practical aspects of skills acquisition. In communication, drama can offer the practical aspect of effective skills development. Perhaps more than any other art form, drama also provides training in the very practical aspects of communication so necessary in today's increasingly information-centred world. Participation in dramatic activity requires self-control and discipline in all aspects of life. As in the case of Moringa cultivation and utilisation, those who participate in the dramatic presentation will learn to work together, cooperate, and find the best way for each member of a group to contribute, and to listen to and accept the viewpoints and contributions of others. This is because success in drama presentation of Moringa value chain will be hinged both on collaboration as well as on individual skill.

Communicating Moringa through Religious Channels

Nigeria as a whole is a very religious nation and religious issues take paramount and significance place in the lives of her people. The churches, mosques and other places of religious activities can serve as a point of informing people about Moringa cultivation and utilisation. For instance, through medium of church, announcement of various uses of Moringa can be made, seminars on utilisation, advertisement of products and training on how to process Moringa can be achieved are feasible options for exploration using the religious channels. This can bring about a tremendous effect and spread of information about the plant if properly annexed.

Religion is a phenomenon that it is impossible to ignore in any attempt to understand and influence development. Religion is a part of reality and is viewed by the majority of the world's population as fundamental to personal, social, cultural and economic aspects of life. Religion is still visible as a force and an inspiration to a great majority of the world's

population. It is also visible in politicians' rhetoric, societal organisation, conflicts and human loyalties, and it has survived its confrontation with science and a secular lifestyle. Religion can provide meaning, structure, community and liberation; based on these peculiarities and features of religion, using this channel to promote Moringa cultivation and utilisation can infuse a strong bond and disposition to its adoption.

Cooperative Societies as a Veritable Tool

Today, in an era when many people feel powerless to change their lives, cooperatives represent a strong, vibrant, and viable economic alternative. Cooperatives are formed to meet people's mutual needs. They are based on the powerful idea that together; a group of people can achieve goals that none of them could achieve alone. For many years now, cooperatives have been an effective way for people to exert control over their economic livelihoods. They provide a unique tool for achieving one or more economic goals in an increasingly competitive global economy.

As governments around the world cut services and withdraw from regulating markets, cooperatives are being considered useful mechanisms to manage risk for members in Agricultural or other similar cooperatives, help salary/wage earners save for the future through a soft-felt monthly contribution that is deducted from source, own what might be difficult for individuals to own by their efforts, strengthen the communities in which they operate through job provision and payment of local taxes. Cooperatives generally provide an economic boost to the community as well (Dogarawa, 2005).

Furthermore, sharing of viable information about Moringa cultivation and utilisation through cooperative societies is a veritable tool that should be explored. The cooperative societies can serve as an avenue where practical information on various utilization of Moringa including means of processing, methods of packaging and benefits of utilisation can be achieved. Communicating about the market opportunities, challenges and channels are

essential things that should flow between all the stakeholders at a parallel level. This suffice that cooperative could serve as structure that will provide enabling environment for farmers, marketers, consumers, transporters and workers within the Moringa value chain to achieve sustainability.

As posited by Gertler (2001), cooperatives are community-based, rooted in democracy, flexible, and have participatory involvement, which makes them well suited for economic development. Thus cooperative societies could serve as a medium to provide information about Moringa on competition, demand and supply trend, and scarcity plan. They can as well serve as a strong structure in determining market stability and competitiveness of Moringa products.

CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This is the last chapter of the dissertation and it comprises the summary of the work done, the conclusion and recommendation which contain essential submissions to bridge the communication gap in the drive to empower people through Moringa cultivation and utilisation. The chapter also reveals the contribution of the study to body of knowledge.

5.2 Summary

This dissertation was premised on promoting Moringa cultivation and utilisation for purpose of empowerment in two selected local government areas in Ekiti State (Gboyin and Ikole LGAs). 188 respondents answered the structured questionnaire, five key informant views were highlighted and others were interviewed to establish level of awareness and effectiveness of communication tools in projecting Moringa cultivation and utilisation.

The study conceptualized Giddens Theory of Structuration as basis for promoting Moringa cultivation and utilisation, which posited that society and not just individual should play a paramount role in effective information dissemination. The result of the study showed that information dissemination is still at individual levels. The awareness level of the population under study showed that people information and knowledge about Moringa cultivation and utilisation are limited and low. The perceptions of the population under study reflected that indigenous communication also has a role to play along with conventional system to achieve better utilization of Moringa. The respondents agreed that Moringa plant has potentials to empower but are skeptical to go into investment purpose due to unfriendly environment identified including unavailable market for Moringa in the study area and no feasible policy of government with regards to Moringa. There is no doubt that Moringa cultivation and utilisation has a great prospect in the study area with realisation of its efficacy

in curing several ailments. Its use for medicinal purpose is a popular phenomenon in the study area.

5.3 Findings from the Study

From the data analysed in this study, it is evident that Moringa cultivation and utilisation has a great future and prospect not only within the scope of study but Ekiti state in general. The following findings are pointers to this assertion:

1. The year of awareness of respondents at mean value was 4.1 which implies majority have known about Moringa within just 4 years. This stresses that level of awareness is still low in Ekiti State especially in the study area. Most of the respondents were educated and could be a factor for their awareness about Moringa.
2. From people's response to Moringa consumption, above average indicated that they consume it as food. The major purpose why they consume it is because of its medicinal effect which people attested could cure fever, stomach ache, infertility, cough, eye problems and host of other diseases. Thus medicinal value informs the major purpose while people cultivate and utilise it.
3. Various channels were identified by the respondents as means through which they become informed about Moringa and later adopted its cultivation and utilisation. The main channels adduced to as responsible were co-farmers and friends, research institutes and traders. The reality that most respondents became aware of Moringa through interpersonal communication is indeed unique.
4. From the data collected, on average, 92% of the respondents agreed that Moringa has unprecedented potentials to empower people of the study area. They see future in its medicinal value, food and nutrition purposes. It was also observed by the researcher that the people are willing to actualise this reality if enabling and encouraging atmosphere needed is provided.

5. The respondents displayed the fear that actualisation of Moringa potentials is being threaten by so many factors which were identified as follows; security, awareness, land availability, market availability, capital, government support etc. they unequivocally agreed that awareness is a major problem that need to be contained. They assert that level of awareness is still low and that resolving that will go a long way to rub on other issues positively.
6. The respondents were of opinion that Government direct support in form of loan provision, infrastructural development, market creation, friendly policy formulation in respect of Moringa would affect its cultivation and utilisation positively. They see the need to involve all stakeholders, right from the least to the highest as a necessity to make this happen.

5.4 Recommendations

Based on the findings of this study, the following recommendations are made:

1. Effective orientation and awareness creation should be provided for the people (both famers and non-farmers) of the study area to appropriate the potentials of Moringa in empowering and improving their livelihood through effective communication channels.
2. There should be synergy between conventional communication channels and traditional modes of communication available in the study area.
3. There is need for local people to form cooperative organization which help to pull resources together to improve and encourage peoples' participation in Moringa cultivation and utilization as a precursor to better livelihood and wealth.
4. Research and academic institutes should translate and share multitudes of research findings and works on various issues surrounding Moringa with the local people so as to broaden horizon of knowledge and actualization of Moringa potentials in empowerment process of the local people.

5. There is need to explore multidimensional means of communication in promoting Moringa cultivation by all stakeholders.

5.5 Contributions to Body of Knowledge

1. The study has significantly shown the place of interpersonal communication in creating awareness about Moringa cultivation and utilisation in the study area. This thus underscores the need to place importance on indigenous communication which centres largely on interpersonal relationship especially on development interventions across various fields of life. The need to investigate the possibility of combining the conventional communication system with indigenous method for development communication is now emerging.
2. This study highlights that there is a relationship between awareness and empowerment. There is therefore need to investigate the correlation of level of awareness to empowerment of people to achieve sustainable development.
3. The study shows a gap between individuals and institutional relationships. There is need thus to evaluate how this relationship can affect empowerment and the role it can play in actualising development communication beyond Moringa issue.
4. The role played by individual, groups, agencies of communication, government policies and appropriate channels of communication can be both enabling or constraining factors in realisation of Moringa potentials for the populace. This interplays need to be investigated and study thoroughly.

5.6 Conclusion

The findings from this study presented a reality of varying potentials Moringa cultivation and utilisation could achieve in the study area if necessary interventions which cut across information dissemination, proactive use of tools of communication, pragmatic and enduring government policies, people's interest and readiness to participate, political will of the populace, ingenuity and creativity of the local people and availability of supportive infrastructures are put in right perspective. Also, available data analysed from this study indicated that present awareness level of the populace is a far cry from what is needed to achieve empowerment and sustainability. However, the level of interest exhibited by respondents showed a positive hope and future for Moringa use in the study area. Although majority of the respondents attested to the fact that Moringa as a source of empowerment can only be achieved when such feasible factors (as land and market availability, increase in awareness, enabling environment that cut across government participation and support for all potential Moringa cultivators, processors and marketers as well as security and well defined and regulated market that is competitive in all sense) are put into consideration.

The experiences of the last decades have shown that human resources development is essential for food security and market integration. Achieving sustainable agricultural development is less based on material inputs than on the people involved in their use. Thus the focus on human resources calls for increased knowledge and information sharing about agricultural production and utilisation, as well as on appropriate communication methodologies, channels and tools. This sufficed to say that notwithstanding wide acceptance worldwide that *Moringa oleifera* is a bundle of blessings to humanity cutting across agroforestry practice, cosmetics, pharmaceuticals, animal feeds, biogas and cottage industries for rural people to ensure empowerment, people awareness of its cultivation and utilisation diversity is still a novel idea in many places in Nigeria. The need therefore to bridge this

communication gap is a reality that has be addressed to achieve the plant full potentials as agent of empowerment and sustainable development.

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INTERVIEWS

Key Informant I: Mr Yusuf Olajide from Ode Ekiti, A marketer of Moringa leaf powder and other products

Key Informant II: Madam Nimota Adeleye (Iya Egbe Ayeayemi) A herbal seller at Ikole Market, Ikole Ekiti

Key Informant III: Mrs Bimbo Yusuf, the Information officer of Gboyin Local Government Area

Key Informant IV: Mrs Kemi Bakare from Aisegba Ekiti, Gboyin Local Government Area

Key Informant V: Mr Mathew Ajayi, Agric Extensionist at Ikole Local Government Area

APPENDICES:

APPENDIX A1:

QUESTIONNAIRE FOR COMMUNICATING MORINGA CULTIVATION AND UTILISATION

BACKGROUND INFORMATION

1. Name of Village/Market			
2. Age of Respondent			
3. Sex of Respondent	Male	Female	
4. Marital status	Married	Single	Widow/Widower
5. Size of household	Number of Wives	Number of Children	
6. Farm size			
7. Educational status (***please tick the highest level of education you attained***)	Primary Education		
	Secondary Education		
	Tertiary Education		
	Adult Education		
	Others specify		

A. RESPONDENTS' LEVEL OF AWARENESS ON MORINGA CULTIVATION AND UTILISATION

1. For how long have you been aware of the Moringa? .....

2. Do you have *Moringa oleifera* on your farm/house?

Yes	No

3. How did you come about the *Moringa oleifera* on your farm?

Planted	Inherited	Wildings

4. For what purpose do you plant *Moringa oleifera* on your farm?

Food	Medicine	Commercial	manure	Fencing

5. Do you consume *Moringa* (Drumstick tree)**?**

Yes	No

6. Which part of *Moringa* do you consume?

Leaves	Pods	Flowers	Root	Other

7. Does *Moringa* become scarce at certain times of the year?

Yes	No

8. If yes, during which months is there a scarcity of *Moringa?*

MONTHS	Leaves	Pods	Flowers	Roots	Other
JANUARY					
FEBRUARY					
MARCH					
APRIL					
MAY					

JUNE					
JULY					
AUGUST					
SEPTEMBER					
OCTOBER					
NOVEMBER					
DECEMBER					

9. Do you harvest, process and store *Moringa*? (If *yes*, please specify)

Parts Stored	**Harvest**	Process	Storage Method
Leaves			
Pods			
Flowers			
Roots			
Other			

B. SOURCES OF INFORMATION ON MORINGA CULTIVATION AND UTILISATION

1. Among the following, who/what source convinced you to start cultivating and utilising Moringa

Extension workers	Village /Community leaders	Co-farmers/ friends	Research Institutions	Traders	Others, (specify):

2. Do you have contact with extension agent(s) as regard Moringa cultivation and utilisation practices?

Yes	No

3. If yes, give number of times a year? ……

4. Do you belong to any association?

Yes	No

5. If Yes, how many associations? .....

6. If Yes, how long? ……

7. What are the channels of communication used in your association(S) to pass information?

...……

8. Identify the degree of reliability of the following sources of information on Moringa cultivation and utilisation.

MEDIA/AGENTS	4 Most Reliable	3 Reliable	2 Somewhat Reliable	1 Not Reliable
Extension Agent				
Newspapers				
Television				
Radio				
GSM phone				
Research Institute				
Friends/neighbors/Co-farmers				
Village heads/opinion leaders				
Cooperative Society				

Others, (specify): ……

9. What means of communication informed you about Moringa and its uses? .....

10. List indigenous means of communication that can help in informing people about Moringa utilisation

(a) …… (b)……(c)……
(d)…….

(e)…… (f)……. (g)……..

C. CHALLENGES ASSOCIATED WITH EMPOWERMENT OF LOCAL PEOPLE THROUGH MORINGA VALUE CHAIN

1. What are the benefits of choosing appropriate communication channels in respect of Moringa cultivation and utilisation?

……

……

……

2. Mention factors that could truncate empowerment of local people through Moringa value chain in your locality

……

……

……

3. What are your suggestions for alleviating these highlighted problems? ……

……

……

…….

4. In your own assessment grade the following issues which could act as limiting factors in Moringa value chain. (Score in order of significance from 1 to 5, 5 being highest in severity)

TOOLS	**SCORE**	**REASONS FOR THE RANKING**
MARKET AVAILABILITY		
SECURITY		
LAND USE		
MIDDLEMEN		
STORAGE FACILITY		
AWARENESS LEVEL		
ADULTERATION OF PRODUCT		
INFRASTRUCTURE		
COST IMPLICATION		

D. POTENTIALS OF MORINGA VALUE CHAIN IN EMPOWERMENT PROGRAMME

1. Do you know that Moringa is a plant with diverse potentials?

Yes	No

2. If yes, what area of its potentials is your interest or you have started something on?
3. How do you think these potentials can be realised?

…….

……

4. In your own word, what strategy will you suggest for communicating Moringa potentials to achieve sustainability?

……
……
……

5. What role do you think Government should play in communicating about Moringa potentials?

.....

6. What role do you think proper information on Moringa can play in empowerment of rural people?

.....

7 How can flow of communication in respect of Moringa cultivation and utilisation be improved upon?

.....

8. From all the mentioned sources of information on Moringa cultivation and utilisation, which of these appeal to you most? Give your reasons

.....
.....
.....
.....
.....

E. COMMUNICATING EFFECTIVELY MORINGA CULTIVATION AND UTILISATION

1. Rank the following communication tools in order of importance of how they have helped you to acquire knowledge on Moringa cultivation and utilisation. Score the least 1 and the highest 10 (Rank from 1 to 10).

TOOLS	**SCORE**	**REASONS FOR THE RANKING**
NEWSPAPER		
RADIO		
TELEVISION		
VIDEO		
PHONE		
PICTURES		

WORKSHOP		
ORAL INFORMATION		
INTERNET		

2. Give other tools of communication that has helped you in acquisition of knowledge on Moringa cultivation and utilisation

   ……
   ……
   ……
   ……

3. What are those cultural factors that are important to acceptance of Moringa utilisation in your locality?

   i.....ii……. iii……

iv……v……vi……

vii……viii……ix……

4. What are the implications of these cultural factors?

   ……

…….

…….

5. Grade the following indices as it affects effective communication of Moringa value chain

INDICES	SA	A	N	D	SD
Information through the new media from Government has helped farmers to be aware of how to produce and sustain Moringa farming					
Demonstration through field school by Research Institute is most appropriate					
Interpersonal communication directly with the farmers is key to sustenance					
Feedback mechanism using the extension agents alone is enough for farmers'' sustenance					
Direct information from the government is enough to cause revolution of Moringa production					
Regular shows on TV, radio advertorials and newspaper news are adequate to help farmers sustain Moringa cultivation and utilisation					
Research publications, journals when made available to farmers can					
No single channel of information is enough to cause sustainability in respect of Moringa cultivation and utilisation					
There is need to provide conducive environment for flow of information for sustainability to be achieved					
Indigenous communications that are peculiar to farmers have a major role to play in sustainability of Moringa cultivation and utilisation					

APPENDIX A2

KII/INTERVIEW CHECKLIST

OPEN ENDED QUESTIONS FOR INTERVIEWS

1. What do you know about growing and utilising Moringa?
2. How do you go about planting Moringa?
3. What are the challenges you faced in growing Moringa?
4. How have you been able to curtail these problems?
5. What purposes do you make use of Moringa?
6. Is there any particular reason why you use Moringa in your household?
7. Do you think Moringa should be introduced to other people who do not know about it?
8. What are the various ways in which Moringa could be harvested, processed, stored and prepared?
9. What means of communication do you think can promote Moringa usage in this community?
10. What are the challenges facing effective communication of Moringa potentials in your locality?
11. How can these challenges be curtailed?
12. What role do you think government can play in actualising potentials of Moringa in your community?
13. What role can indigenous communication play in promoting Moringa cultivation and utilisation to achieve empowerment in your locality?
14. Who do you think should be stakeholders in Moringa communication?
15. What is the way forward to achieve sustainability of Moringa cultivation and utilisation?

APPENDIX B1

Pix 1: A young Moringa tree beside a well at Odo-Oro Ekiti in Ikole LGA

APPENDIX B2

Pix 2: A full grown Moringa plant at Ikoyi in Ikole LGA

APPENDIX C1

Pix 3: A Moringa plant fruiting at Ode Ekiti in Gboyin LGA

APPENDIX C2

Pix 4: Harvested Pods of Moringa plant

APPENDIX D1

Pix 5: Some Farmers in a discourse about Moringa at Ode Ekiti, Gboyin LGA