The 50th
Inaugural Lecture of the University of Uyo.

WHY DID MRS. X DIE ?

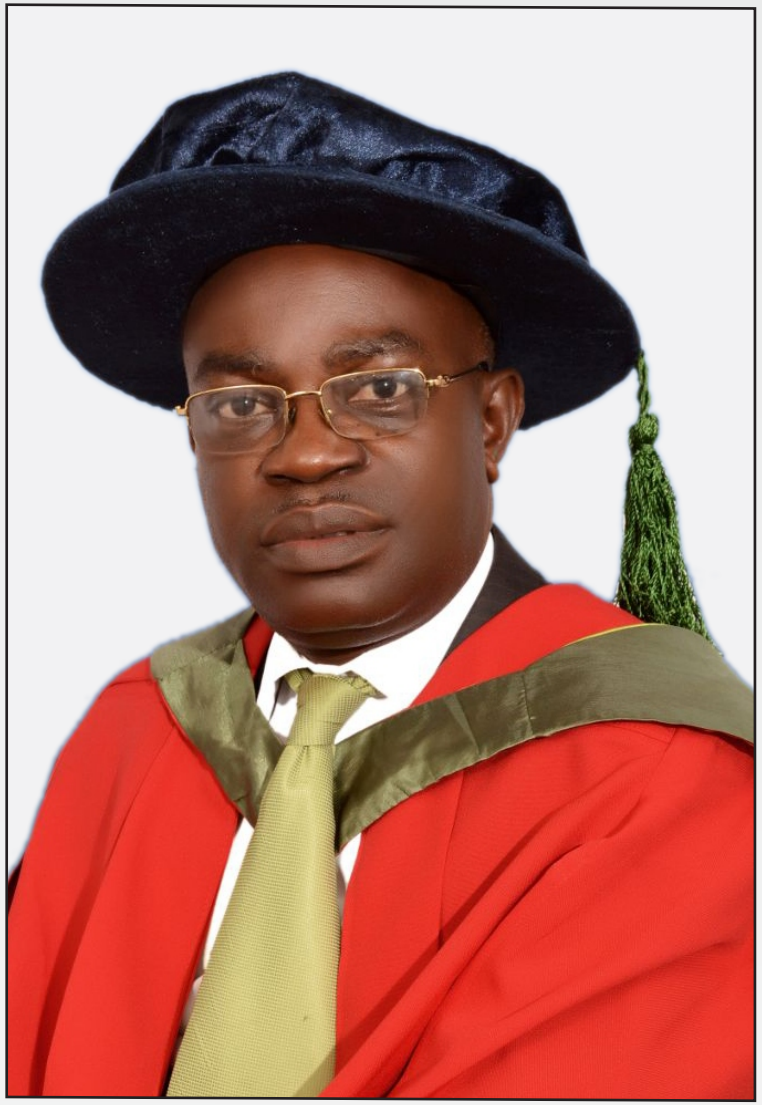
Reflections on Wetlands Agriculture Development in Nigeria.

Gabriel S. Umoh

The 50th Inaugural Lecture of the University of Uyo.

Thursday, 27th October, 2016

Notes



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&

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Published by
University of Uyo Press Ltd
University of Uyo
Uyo
Nigeria

Typeset by
Professor Gabriel S. Umoh
Department of Agricultural Economic and Extension
University of Uyo
Akwa Ibom State
Nigeria

Design and Layout:
Hubitz Tech
69 Enwe Street , Uyo
Akwa Ibom State
Nigeria
+2348088881058
www.hubitztech.com

ISBN
Printed by
Fabulous Printers and Trading Company
08023023417, 08134656028

Cover Photo
Itu Wetlands
Akwa Ibom State

Membership of Professional Bodies:

Prof. Umoh is a Life Member of Nigerian Economic Society,
Member, International Water Resources Association
Member, Nigerian Association of Agricultural Economists & Editor, Nigerian Journal of Agricultural Economics.
Member, Farm Management Association of Nigeria,
Member, Nigerian Rural Sociological Association.
Fellow, Salzburg Seminar 404.
Member, Association of Women in Development (AWID)

Family Life

Professor Umoh believes in a life of 3 Ps (Planning, Praying and Persisting). He is happily married to Mrs. Nsikak Umoh, Ph.D and the marriage is blessed with five lovely children.

Achievements/Awards

Professor Umoh has won several awards including (i) Akwa Ibom State Scholar (1988 – 1991), (ii) Federal Government of Nigeria's Scholar (1993).

He has won many research and travelling grants from international agencies including:

- Canadian International Development Agency (CIDA, 2011),
- Council for the Development of Social Science Research in Africa (CODESRA, 1999),
- African Economic Research Consortium (AERC, 1998),
- International Human Dimensions Programme on Global Environmental Change (IHDP, 2000),
- UNDP India (2009),
- The British Council (2015).

Prof. Umoh is listed in the Silver Jubilee Edition of **Who's Who in Akwa Ibom State**, 2012

He is a proud holder of 2 traditional titles:

1. *Iberedem* (Pillar) Iman Ibom
2. *Unwana* (Light) of Ikot Ukpong Iman.

He is a member of Edidem's (Paramount Rulers') Advisory Council, Iman Ibom (Etinan)

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To date he has impacted on over 36 communities in Akwa Ibom State. Prof. Umoh is a Master Trainer and has built the capacity of over 500 civil society organizations, and several early career development practitioners across Nigeria.

He is the Chairman of a pan African movement- Africans Rising Movement (ARM), Nigeria- a continent-wide movement for justice, peace and sustainable development of African countries. Professor Gabriel Umoh is the President of the University of Uyo Alumni Association, Worldwide. As an Economist, he has effectively used his knowledge and skills to reposition the Association which is currently constructing a 62 room Guest House with 1400 sitting capacity Event Centre. It has awarded grant to support higher education of members. Professor Umoh is the architect of “UNIUYO IS A BRAND, PROTECT IT” campaign.

Professor Umoh likes putting back into the system that made him. In 2014, he instituted a prize- PROFESSOR GABRIEL UMOH'S PRIZE for the best graduating student in Agricultural Economics. His alma mater at various levels of education have also benefitted from his philanthropy.

Professor Umoh is an activist with eyes on service. As a student, he was:

- the Secretary, Nigerian Association of Agricultural Students (NAAS), Unicross Chapter, (1988-1989),
- the President, Nigerian Association of Agricultural Students (NAAS), Unicross Chapter, (1989-1999).
- Chairman, Students Consultative Committee, Okuku Campus, Unicross

He used his position as NAAS President to ensure that Unicross and Uniuyo graduates of agriculture obtained B. Agriculture degree with specialization.

Professor Umoh is the Founder and Chief Executive Officer of **African Human Development Centre** (AHDC), a Non-Governmental Organization with a mission of promoting the socio-economic and political development of women, children and vulnerable groups through advocacy, capacity building and modeling service delivery. Through this NGO, Prof. Umoh has invested enormously in community development, particularly on children and women development, social infrastructure (health, education and income- generating facilities).

1.0 INTRODUCTION

1.1: Protocol

The Vice Chancellor
Deputy Vice Chancellors ((Administration & Academic)
The Registrar
Provosts
Dean, Faculty of Agriculture & Deans of other Faculties
Directors, Heads of Departments & Units
My Colleagues (Lecturers)
Great Tuskers
My Lords Spiritual & Temporal
Distinguished Ladies and Gentlemen

1.2: My Encounter with Wetlands

My father, late Elder Sunday Peter Umoh, was a farmer. He was an Agricultural Development Project Contact Farmer. He cultivated wetlands/swamp rice as well as upland rice mostly. I grew up to have mixed feelings about my father's adventure into rice farming. Rice farming is full of drudgery. It passes through many more processes than most other crops to get to the table of the consumer. Of particular un-cheery memory of growing up as a child of a rice farmer was having to stay away from school for weeks to scare away birds in the rice farm whenever someone hired to do this aspect of the work, probably frightened by loneliness, escaped from the rice field! However, the good thing was that while other children in the neighbourhood ate rice only on festive periods, I ate rice regularly. Before I graduated from the primary school, my father had dropped this business and moved onto something else.

Mr. Vice Chancellor, this marked my first encounter with wetlands farming.

My second encounter with wetlands farming was at far away University of Ibadan. This time around, it was not in the field but in the Department of Agricultural Economics where I had gone to do my doctoral research. It was one bright Thursday morning. I had proposed to research on poverty for my PhD. I had to defend my proposal before my Supervisor. It was an explosive encounter. I left my Supervisor's office totally confused following his rejection of the topic. I did not know what he really wanted. While hanging around the corridor of the Department and in deep thought, I heard a voice say: "Umoh, I hope you are thinking of what else to do?" It was still my Supervisor. "Yes, sir", I responded, trembling. I reverted to my deep reflections as soon as he left me. It was in this deep reflection that I recalled that my senior colleague and former teacher, the then Mr. S. O. Edem (now Dr. S. O. Edem) was conducting his PhD research on wetlands soils.

I told myself: "You are an economist, why don't you look at the economics of wetlands farming?" I quickly wrote down three interrelated topics, the first on the list being "Economics of Wetlands Farming in Akwa Ibom State, Nigeria". When I presented the topics to my Supervisor, he was in love with the first i.e. Economics of Wetlands Farming in Akwa Ibom State, Nigeria.

Community Service

Professor Umoh believes that "laurels without legacy are empty". For this reason, in addition to his work as a scholar, he is a change agent, a renowned development practitioner and consultant. He was:

(i) Senior Research Adviser (on Social Impacts Assessment) to Shell Petroleum Development Company (2015 – 2016),

(ii) Zonal Coordinator, Millennium Development Goals-Conditional Grants Scheme (MDGs-CGS), (2011 – 2013),

(iii) Coordinator/Consultant EU-Micro-projects Programme in Six States of the Niger Delta (EU-MPP6), (2003 – 2008),

(iv) Consultant, EU-Micro-projects Programme in Nine States of the Niger Delta EU-MPP9 (2010),

(v) Zonal Programme Mentor EU-INSIDE (Increasing Non-State Actors' Implementation and Development Expertise, 2009), South East Zone.

Professor Umoh has consulted for several international and national organizations including the World Bank, African Development Bank, European Union, International Livestock Research Institute, United States Agency for International Development, National Fadama Development Project, Citizen's International, etc.

7. Chairman, Faculty of Agriculture External Linkage Programme
8. Member, University of Uyo Space Allocation Committee
9. Member, University of Uyo Community Relations Committee
10. Member, Business Advisory Board, *entrepreneurial action us* (enactus), University of Uyo
11. Associate, Centre for Skill Acquisition and Rural Development, (CSARD, University of Uyo)
12. Member, University Uyo Publications Committee
13. Member, University of Uyo Consultancy Advisory Board
14. Head, Department of Agricultural Economics and Extension, University of Uyo, 2008-2010 & 2012-2014.
15. Director, Centre for Wetlands and Waste Management Studies
16. Member, University of Uyo Senate
17. Member, University of Uyo Governing Council

In approving this topic for my thesis, he said to me: *"*I am a practical man. You could be made Commissioner of Agriculture in Akwa Ibom State and be called upon to develop wetlands agriculture… This topic will give you the opportunity of solving a practical problem*"*.

Ladies and gentlemen, this was my journey to the world of wetlands agriculture. I must confess that I have found many things and have done many things in this journey, and it is my pleasure to humbly invite you all to join me, mentally, to this vast world of wetlands agriculture through this Inaugural Lecture for which I have selected the title: **Why Did Mrs. X Die?: Reflections on Wetlands Agriculture Development in Nigeria.**

Mr. Vice Chancellor, ladies and gentlemen, my presentation draws its major inspiration from two experiences I had in the course of doing my work as a researcher as well as community development practitioner. My first experience with Mrs. X was in 2010. In that year, with a research grant from the Canadian International Development Agency (CIDA), I led a team to investigate how farmers in the Niger Delta were adapting to the impacts of climate change as part of the Building Nigeria's Response to Climate Change (BNRCC) Project. The study entitled: *Adaptation to Climate Variability by Farming Households in the Niger Delta Region, Nigeria* was conducted in the three states of the Niger

Delta- Akwa Ibom, Ondo and Rivers States. One of our study sites was Ayadehe community in Itu Local Government Area of Akwa Ibom State. While trying to ascertain the impacts of climate change on the livelihoods in this community, we were confronted with a very sad story of a poor woman- a cocoyam farmer who died because her crop, cocoyam failed. This unfortunate woman, whom I have chosen to call Mrs. X, was said to have obtained a loan of forty thousand naira (₦ 40,000) to cultivate cocoyam (Ayadehe, Itu was well known for the production of the *colocasia* variety of cocoyam, known in Akwa Ibom State as *nkene bok eyen, ikpong nwa ekpo, asobo*, among others). She had utilized the loan to plant cocoyam in the wetlands (which abound in Itu) and tended the crop as expected by performing all cultural operations (land clearing, planting, weeding, etc).

Given the fertile nature of wetlands, she had expected to obtain a bumper harvest, and to have enough to feed her household and sell some to repay the loan she had collected. The crops were nearing maturity when she heard of a "strange disease" affecting cocoyam in farms in the community and its environs. "Mrs. X" was said to have headed to her farm immediately. On reaching the farm, all her crops had withered and died. Mrs. X is reported to have collapsed and died on the spot!

Professor Umoh has a rich research interest spanning Agricultural Policy & Development, Environmental Economics and Climate Change, Production Economics, and Wetlands Agriculture.

He is a widely travelled scholar and has been to several countries including Germany, United Kingdom (Oxford & Scotland), Austria, India, Kenya, Tanzania, Ghana, among others.

As a Lecturer, Professor Umoh has served in various capacities, contributing to the development of the University. These include;

1. Assistant Coordinator, University of Uyo Commercial farm
2. Chairman, Research and Development Committee, Department of Agricultural Economics and Extension.
3. Chairman, Postgraduate Committee, Department of Agricultural Economics and Extension
4. Representative of Faculty of Agriculture in the Faculty Boards of Education, and Environmental Studies
5. Business Manager, Nigerian Journal of Agriculture, Food and Environment (A publication of the Faculty of Agriculture, University of Uyo)
6. Chairman, Faculty of Agriculture Examinations Vetting Committee

In 1993, he was invited to join the services of the University of Uyo as a Graduate Assistant. After obtaining his Masters Degree, Professor Umoh was upgraded to the rank of an Assistant Lecturer in 1994. By 1995, he was promoted to the rank of Lecturer II. He rose to the position of Lecture I in the year 2000, Senior Lecturer in 2003 and Associate Professor in 2006. Professor Umoh was promoted Professor with effect from 2009 at the age of 44. He was Adjunct Professor, Akwa Ibom State University, 2014 – 2016.

Academic Life

Prof. Umoh has 23 years of teaching and research experience in the University. He teaches Research Methods, Agricultural Policy and Development, Environmental Economics, Production Economics, Project Management both at the Postgraduate and Undergraduate levels. He has supervised about 100 Undergraduate and 20 Postgraduate students including PhDs.

Prof. Umoh has published widely in both international and national academic journals. He has over 80 publications and still counting. He is the lead author of the book: **Adaptation to Climate Change: Agricultural Ecosystems and Gender Dimensions**, published by Xlibris, UK.

My second experience with Mrs. X was in year 2013. I attended a training programme on Human Rights-Based Approach (HRBA) to development organized by ActionAid Nigeria. It was during the training that I first came across a video clip by the title "Why Did Mrs. X Die?" The video clip was about a woman who lost her life due to poor healthcare system.

Mrs. X, a fictional character in the video clip, could not access healthcare services when she was ill. Healthcare service was not available to Mrs. X when she needed it owing to the failure of government to keep the health facilities functional! In my analysis of the video story, Mrs. X died because of the failure of government to perform its expected function of making healthcare available to all strata of the population. Specifically, corruption, incompetence, poor attitudes to public services, policies and infrastructure failure in the health sector contributed to the predicament of Mrs. X.

The video clip entitled: 'Why Did Mrs. X die?' and the story of the cocoyam farmer made a lot of sense to me, particularly with regard to the sector which has engaged my research interest for the past one and a half decades- wetlands agriculture.

So, Mrs. X in this lecture is a real as well as a fictional or symbolic character. Symbolic in that the character represents the poor farmer who, year in, year out struggles to eke out a living from the land but is confined to a life of want and poor health as if being a farmer is a curse. In many cases, her state of poverty limits her accessibility to good and nutritious food, good medical care, and ultimately, she is barely able to

make it beyond her 50th birthday. The question, therefore is: why did Mrs. X die? Before turning to this very important question, which I will turn to again and again in this lecture, let me first attempt to explain some terms for a smooth communication with you. These are "wetlands" and "development".

1.3: Conceptual Definition of Terms

Wetlands: Literature of wetlands science contains varying definitions of wetlands. The most popular of these is that by Ramsar Convention on Wetlands of International Importance which defines wetlands as "areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is flowing or static, fresh, brackish or salty, including areas of water the depth of which at low tide does not exceed six meters" (Ramsar Convention on Wetlands www.ramsar.org). Ecologically, wetlands are transitional between open water and terrestrial ecosystems and endowed with specific structural and functional attributes performing major ecological roles in the biosphere (Edwards, 1986).

Development: The concept of development has evolved over time. In its orthodox form, development is virtually synonymous with economic development which, in turn, is seen as growth and structural transformation of the economy. However, this concept has been broadened to include not only growth and structural transformation issues, but also such equity issues as income distribution,

He graduated from Etinan Institute in flying colours in 1982. In 1986, he enrolled in the University of Cross River State (now University of Uyo) and graduated with Second Class (Hons) (Upper Division) in Agricultural Economics and Extension in 1991. After the mandatory National Youth Service Corp Programme which he served in the Nigerian Agricultural and Cooperative Development Bank (NACB now Bank of Agriculture), Warri, Delta State, Prof. Umoh enrolled in the Nigeria Premier University – the University of Ibadan, Ibadan for a Masters Degree programme in Agricultural Economics. Feeling undone with education, Professor Umoh proceeded to do a PhD programme in Agricultural Economics in the same University. He bagged the Degree of Doctor of Philosophy in Agricultural Economics in the year 2000.

Professor Umoh has attended several training programmes and courses in many areas in Nigeria and abroad, which have made him so versatile and able to rigmarole in various fields and disciplines. These include courses in Leadership Development, Security, Safety, Advocacy, Project Management, Monitoring and Evaluation, Computer Application, Business Development, Coastal Zone Management, Water Management, among others.

Work Experience

Professor Umoh's work experience began with National Youth Service Corps Programme when he served in the then Nigerian Agricultural and Cooperative Bank (NACB, now, Bank of Agriculture), Warri Branch from 1991-1992.

10.0: THE MAN: PROFESSOR GABRIEL S. UMOH

Birth & Parentage

Gabriel Sunday Umoh, Ph.D, is a Professor of Agricultural and Development Economics. He was born on September 13, 1965 to Elder Sunday Peter Umoh and Madam Esther Sunday Peter of Ikot Ukpong Iman in the present Etinan Local Government Area of Akwa Ibom State, Nigeria. He is the fourth in a family of six children – all males. Because of his father's love for education, he was named after the first Teacher Grade II graduate in his village- Late Mr. A. A. Uko. The young Uko had the baptismal name Gabriel given to him by his local church-Christ Army Church, while his mother calls him Teacher. Therefore, Professor Gabriel Umoh is a teacher by birth and by inclination!

Professor Umoh grew up under the great influence of a strict father who would beat and warn if you did wrong in some other ways but would threaten to disown you if you told a lie. He insisted on being truthful in all circumstances and at all times, respecting truthful elders and constituted authorities, being circumspect, and having dignity for labour.

Education

When he was of school age, the young Gabriel was enrolled in Group School, Ikot Umiang Ede/Ikot Ukpong Iman for his Primary Education. He graduated from the Primary school with Distinction in 1977. On leaving the Primary school, Gabriel proceeded to the prestigious Etinan Institute, Etinan, for his secondary education.

full employment and unfettered opportunities for the people to realise their economic potentials. Further expansion of the concept of development in more recent times accommodates non-economic issues, particularly those related to social, political, legal, cultural and environmental issues in what is otherwise known as sustainable development.It conceptualizes development as one which meets the needs of the present generation without compromising the needs of future generations. It implies sustained improvement in the quality of life of the present and future generations.

Development in the broad sense just described implies consistently improving human socio-economic welfare. It is a holistic view of development in which micro-macro-economic, social, political, cultural and technological variables are engineered, combined and implemented as an organic and dynamic whole for the benefit of the people (Onimode and Synge, 1995).

1.4 The Central Theme of My Lecture:

The central theme of this lecture is to highlight how public policies, programmes and projects impact on farmers' wellbeing. In this lecture, we adopt the sustainability view of development. Applied to the subject of my discourse, the development of wetlands agriculture can be seen as sustained improvements in the socio-economic welfare of wetlands farmers and all those associated with wetlands agriculture. This would also include the social, economic, political, cultural, technological, infrastructural transformations that have taken place in the wetlands

agriculture sub-sector. So, the question which this Lecture seeks to address is: how have the wetlands farmers been faring after decades of public wetlands agriculture development in Nigeria?

2.0 WETLANDS AGRICULTURE: A HISTORICAL PERSPECTIVE

Several literature that I have consulted in the course of my study of wetlands agriculture reveal that people have had intimate association with wetlands from prehistory to the present day. Swamps, marshes, estuaries and other types of wetlands have been among the most attractive areas in the landscape, satisfying a variety of needs for hunting and gathering, spirituality, water resources and agriculture (FAO, 2008). Evidence abounds to show that wetlands have made significant contributions to the well-being of many societies around the world over the centuries and even millennia.

Wetlands agriculture has formed the bedrock of human civilization. Initially, human settlements primarily occurred in fertile areas along rivers. In the floodplains of Mesopotamia, such settlements were the very cradle of human civilization 6000 years ago (Verhoeven and Setter, 2009). From the early beginning of agricultural activities, such riverine wetlands have been recognized as valuable land areas for food and fodder production, because they have fertile soils as a result of regular sediment deposition during flood events. Studies show that Mayan wetlands agriculture in Central America dates back 3000 years (Denevan, 1982).

Umoh, G.S and E. J. Udoh, V. Solomon, G. E. Edet, G. I. Okoro, C. Uwem, N. Bassey and O. D. Akpan (2014). Analysis of Upland farm Households' Vulnerability to Climate Variability in the Niger Delta, Nigeria. *Journal of South Pacific Agriculture* 17(1 & 2): 77-90.

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Verhoeven, J. T. A. and T. L. Setter (2009) Agricultural Use of Wetlands: Opportunities and Limitations. *Anals of Botany*: 1-9.

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www.waterhistory.org. Accessed: June 12, 2016.

Yuki, G. (2010) *Leadership in Organizations,* Pearson, Upper River, New Jersey, USA.

Umoh G.S. and S. A. Yusuf (1999b) An Empirical Analysis of the Poverty Status and Productivity of Rural Farmers in Obubra, Cross River State, Nigeria. *The Nigeria Journal of Economic and Social Studies* 4(2): 259 -273.

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------; Okon, S. and Umoh, O. J. (2004) Supply Response of Nigeria's Agricultural Tradables: A Short-Run Analysis. *South-South Journal of Culture and Sustainable Development*. 6(1): 131-151.

------; E. J. Udoh, V. Solomon, G. E. Edet, G. I. Okoro, C. Uwem, O. D. Akpan and E. Atairet (2011) Adaptation to Climate Variability by Farming Households in the Niger Delta Region. Final Report submitted to Building Nigeria's Response to Climate Change/Nigeria Environmental Study/Action Team. 136p.

------; E. J. Udoh, V. Solomon, G. E. Edet, G. I. Okoro, C. Uwem, N. Bassey, O. D. Akpan, E. Atairet (2012) "Climate Change Information Supply to farmers in Nigeria: Sub-Regional Analysis of Institutional Capabilities" A Paper presented at the 1st World Conference on Applied Science and Technology, University of Uyo, October 2-6, 2012.

------; E. J. Udoh, V. Solomon, G. E. Edet, G. I. Okoro, C. Uwem, N. Bassey, O. D. Akpan, E. Atairet (2013) Adaptation to Climate Change: Agricultural Ecosystems and Gender Dimension. UK, Xlibris. 145p.

Bayliss-Smith and Golson, (1992) reported that in Southeast Asia and the Pacific, staple crops adapted to wetlands conditions have been cultivated and consumed for thousands of years. In Africa, agriculture has long been practised in the floodplains of major rivers such as the Niger, Zambezi and Nile, among others (Gluckman, 1941).

Wetlands development is said to have originated with the early civilisation of Egypt, Mesopotamia, India and China where the valleys of the Nile, Tigris, Euphrates, Indus, Yangtse and Nwantto were respectively developed as centres of civilisation and regional development. Records have it that the ancient Egyptians were aware that the water of the Nile brought down alluvial soil deposits from Equatorial Africa. With each annual inundation of the Nile, this black silt was deposited on either side of the Nile; covering large areas of the parched desert. This silt was rich and fertile and, when cultivated brought forth abundant crops.

The well-known biblical account of Joseph and the Pharaoh's dream is a reasonable reflection of the threat of famine that Egyptians periodically faced. Asked to interpret his ruler's dream, Joseph foretells several years of abundant harvests followed by seven years of shortage, and advises the Pharaoh to begin storing massive quantities of grain to avert famine. During a period of disappointing floods between the reigns of Ramses III and Ramses VII in the twelfth century BC, food shortages caused the price of wheat to rise markedly. Prices stabilised

at a high level until the reign of Ramses X, and then fell rapidly as shortages eased by the end of the Ramessid Dynasty, about 1070 BC.

In combination, the reliability of the Nile flood and the unpredictability of its magnitude rooted ancient Egyptians deeply in nature and fostered respect for order and stability. Rulers were viewed as interveners with the gods to help ensure prosperity. Father of all gods was the god of the Nile-Hapi, who, although male, was portrayed with breasts to show his capacity to nurture.

The Egyptians worshipped Hapi not only in temples, but through hymns:

> *Praise to you, O Nile, that issues from the Earth, and comes to nourish Egypt . .*
> *If his flood is low, breath fails, and all people are impoverished; the offerings to the gods are diminished, and millions of people perish. The whole land is in terror . . .*
> *When he rises, the land is in exultation and everybody is in joy . . .*
> *He fills the storehouses, and makes wide the granaries; he gives things to the poor*. (www.waterhistory.org.)

Besides the Egyptian success in wetlands agriculture, researchers have documented the fertile nature of wetlands which have made them attractive to genuine farmers. Grove (1985) reports that in the semi-arid zone of West Africa, during the wet season, rain-fed agriculture is possible and there are grasslands providing relatively nutritious grazing for livestock away from the river valleys.

Umoh, G.S. and A. J. Adegeye (2000) Environmental Conservation and Food Self Sufficiency: A Study of Wetlands Farming in the Niger Delta, Nigeria. In: Fabiyi, Y. L. and E. O. Idowu (eds) *Poverty Alleviation and Food Security in Nigeria.* Proceedings of Nigerian Association of Agricultural Economists. Pp: 192-196.

-----A. A. Azeez (2000) Rural Savings mobilization and Agricultural Production in the Southern Zone of Abia State. *Global Journal of Pure and Applied Sciences*. 7(2): 249-255.

-----and F. Eketekpe (2010) Climate Change and Agriculture in the Niger Delta: A Study of Wetlands Farmers' Adaptation to Climate Variability in Bayelsa State. In: J. Nmadu, M. A. Ojo, U. S. Mohamed, K. M. Baba, F. D. Ibrahim and E. S. Yisa (eds) *Commercial Agriculture, Banking Reform and Economic Down-turn: Setting Agenda for Agricultural Development in Nigeria.* Proceedings of the 11th Annual Conference of Nigerian Association of Agricultural Economists.

------and I. O. Ibanga (1997) An Alternative Microcredit Delivery Model for Poverty Alleviation in Nigeria. In: *Poverty Alleviation in Nigeria*. Selected Paper for the 1997 Annual Conference of Nigerian Economic Society. 521-532.

Umoh, G.S. (2006b) Resource Use Efficiency in Urban Farming: An Application of Stochastic frontier production Function. *International Journal of Agriculture and Biological.* 8 (1); 38-44.

-----(2007) Nigeria: How has Agriculture Benefitted From Human Capital Development Reforms? Manuscript, Department of Agricultural Economics & Extension, University of Uyo. Uyo.

-----(2008a) The Promise of Wetlands Farming: Evidence from Nigeria. *Agricultural Journal* 3 (2): 107-112.

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-----(2008c) Programming Risks in Wetlands Farming: Evidence from Nigerian floodplains. *Journal of Human Ecology 24(2) 80-92.*

-----(2012) "Does Gender Count in Employment in Public Agricultural Institutions in Nigeria?" In: *Youth Employment and Poverty Reduction in Nigeria*. Proceeding of 53rd Annual Conference of Nigerian Economic Society. Pp: 317-338

-----(2013) Nigeria: In search of Home-Grown Wetlands Agriculture Development Policies. A Paper Presented Annual Conference of Nigerian Association of Agricultural Economists, Ile Ife.

-----(2015) The Ways of Wetlands Farmers. A Manuscript Document department of Agricultural Economic and Extension.

Once the rains end, the pastoralists concentrate on the wetlands such as the delta of Senegal River and the Niger Inland Delta in Mali or Lake Chad. And, it is only in these areas that agriculture can continue into the dry season.

Wetlands agriculture has been practised by people living along the riparian communities in Nigeria long before government interventions. According to Gwarry (1995), in North Eastern Nigeria once the rains have stopped and the floods start to retreat, lands are cleared and irrigation begins in October, a time when the cool harmmattan sets in. Cultivation of major crops such as wheat, pepper, tomato and onion continue up to March.

Aminu-Kano (1994) estimated that about 15,000 hectares of flooded rice is cultivated in and around Nguru/Gashua flood plains alone. Similarly, Agboola (1987) asserts that Abakiliki area in Eastern Nigeria is reputed to have the most developed hydromorphic cropping system in Nigeria. Udofia and Inyang (1987) identified floodplain and swamp farming as the fourth type of agricultural system practised in Akwa Ibom State.

In Nigeria, the indigenous technologies employed in wetlands agriculture such as water-lifting and storage equipment, are not sufficiently documented, though. Scanty literature report of the use of *shaduf* in the fadamas of northern Nigeria while calabash, buckets and other earthen wares were used by farmers to fetch water for hand irrigation in most other parts of the country. In the absence of irrigation, these indigenous practices remain among

resource- poor farmers [Umoh, Udoh, Solomon, Edet, Okoro, Uwem, Bassey, Akpan and Atairet (2011), & Umoh, 2015]. Wetlands farming in the arid zone of Nigeria have been an important source of food and revenue to many households.

Some advances have taken place in wetlands farming. One of such is called hydroponics. Hydroponics is a soil-less agriculture. It involves the use of inert medium where plants can take essential nutrients either from water to which is added a nutrient solution or from organic materials that exist in the medium. The media can be gravel, sand, peat, vermiculate, sawdust or other plants materials. The practice of hydroponics is taking root in some countries such as Bangladesh, a country with the highest wetlands to total land ratio in the world (Haq, Ghosh and Islam, 2005). This technology is still at the experimental stage in Nigeria. It is doubtful that the technology when finally adopted will be retained and improved upon in line with the dictates of Nigerian social, economic, cultural, technological and environmental peculiarities, to the benefit of resource poor farmers such as Mrs. X.

3.0: WETLANDS AGRICULTURE: THE GREAT DEBATE!

In spite of the importance of wetlands in agricultural production, research and policy debates on wetlands have primarily focused on its preservation for the bio-resources. Most analysts assumed that wetlands are public goods. Consequently, research is focused on assigning economic value as part of the process of developing and evaluating preservation policies (Doss and Taff, 1996).

Umoh, G.S. (2001a) Governance, Policies and the Growth of Nigeria's Agriculture. *The Nigerian Journal of Economic and Social Studies* 43 (3): 341-363.

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------(2000a) Economics of Wetlands Farming in Akwa Ibom State, Nigeria. Unpublished PhD Thesis, Department of Agricultural Economics, University of Ibadan, 210 pp.

------(2000b) Formal Rural Financial Markets in Nigeria: An Attractive or Deceptive Development Alternative? *South African Journal of Economic Management Sciences*. 3(3):469-483.

------(2000c) Agricultural Administration Capabilities and Food Security in Akwa Ibom State, Nigeria. *Journal of Management Science* 1(October): 90-101

In line with this, Ayeni, Adeniji, Okaeme, Obot, Otubusin (1990) in reviewing the utilization and development of Nigerian wetlands asserted that the concept of wildlife park utilization appears currently in Nigeria to be restricted to land-based resource development whereas there are abundant aquatic wildlife resources, while our wetlands are suitable for conservation of large numbers of game birds. They maintained that wetlands could constitute major resource for the development of better environment, tourism and promoting aesthetic beauty. They concluded that these latter forms of utilization had brought in more revenue (per unit surface area) to East African and Indonesian countries than their destructive uses for food and other alternative uses had brought to any other people previously.

Wetlands, the world over, are recognized as multifunctional natural resources that provide a range of services of inherent value to human well-being (Maltby, 1986). Based on this viewpoint, importance is attached to wetlands largely due to ecosystem services which are but wetlands functions and benefits. These ecosystem services are classified as provisioning, regulating, cultural and support.

Provisioning has to do with the goods produced or provided by ecosystems e.g. food, fuel and fibre. Regulating services deals with the benefits from the processes of ecosystem regulation, e.g. water partitioning and climate regulation.

Cultural services of wetlands are the non-material benefits such as spiritual, recreational and aesthetic. Their supports are the factors necessary for producing ecosystem services namely hydrological cycle, soil formation, and nutrient recycling.

Conservation and livelihoods concerns tend to have divided researchers and commentators on wetlands. I have found myself straddled between the two. I began my search for a position in the two schools of thought by analysing what the people in my immediate environment (Nigeria) were used to doing, are doing and can continue to do regarding wetlands use. My search led me to arrive at the following conclusions:

- that wetland environmental change, which is the concerns of bio-conservationist, is predominantly human-induced;

- that the environmental change arising from resource extraction in turn impacts on the livelihoods of communities;
- that, in order to check over-exploitation of environmental resources and thus mitigate the adverse effects on the environment and people's livelihoods, communities as rational groups should necessarily have a set of rules which guide the behaviour of its members towards the use of the resources;
- that these systems of rules, decision- making procedures and community institutions give rise to social practices, assign roles to participants and guide interactions among members of the relevant roles.

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Soyibo, A. (1996) Financial Linkage and Development in sub-Saharan Africa: The Informal Sector in Nigeria. *Overseas Development Institute Working Paper* 90. London, ODI.

Studies (Ubom and Umoh, 1997; Ekong, Ubom & Essoh, 2001) have shown that communities in Nigeria still retain local institutions that influence natural resource use such as the wetlands resources. Indigenous traditional groups such as Village Councils, Youth and Women Councils were found to wield some powers in control of the use of natural resources. Extant cults such as Idiong and Ekpe in Ibibio of Akwa Ibom State, Ebia in Obu Eki of Cross River State as well as Agulama-agula, Oru-alabo and Aduaa-Odun in Rivers State were once effective in regulating the use of communities' bio-resources, though their powers are dwindling. Among the Bette-Bendi people of Cross River State, there had been *Shindyor* or *Uteem* which represents the modern games reserves – where farming and hunting were disallowed.

Mr. Chairman, ladies and gentlemen, Sustainable Development Goal No. 2 calls specifically to "end hunger, achieve food security and improve nutrition and promote sustainable agriculture". Of the estimated 805 million people experiencing chronic hunger globally, around ¾ live in rural areas and are overwhelmingly dependent on agriculture for their foods and livelihoods. Wetlands agriculture can contribute to the achievement of this goal. Indeed, I have shown in a study entitled: *The Promise of Wetlands Farming: Evidence from Nigeria* (Umoh, 2008), that wetlands account for more than half of the food needs of wetlands households (Table 1). This means a lot to household and national food security and nutrition. I concluded in the study under reference that wetlands have a

lot of promise both for agriculture and other uses, but that a delicate balance must be struck between its use for agriculture and its conservation (Umoh and Adegeye, 2000). In a study of utilization of wetlands of Akwa Ibom State (Edem, Effiong and Umoh, 1998; Umoh, 2015), it was discovered that farmers obtain higher yields and income from wetlands than upland farms (Table 2).

In Nigeria, social indices point to increasing population, reducing man-land ratio and mounting food imports bills (CBN, 2012). Reversing this undesirable trend requires putting available land (including wetlands) to cultivation. Besides, in the absence of sustainable alternative, wetlands farmers such as Mrs. X must earn their living from wetlands because for conservation to be attained, the present has to be fulfilled. Recommendations from studies (Umoh and Adegeye (2000) and Umoh *et al* (2001) are appropriate for striking a delicate balance between conservation and livelihood in the wetlands ecosystems. These include integration of indigenous methods into national system of regulating the use of environmental resources, relevant research, appropriate soil management and environmentally compatible farming techniques and timely farm inputs availability. With these, appropriate wetlands farming practices that would contribute to the food needs of the nation and at the same time conserve the resources of the wetlands ecosystem would be guaranteed. The delicate balance recommended is in line with The Ramsar Concept of "wise use".

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Ogundiya, I. S. (2009) Political Corruption in Nigeria: Theoretical Perspectives and Some Explanations. *Journal of Anthropologist* 11(4): 281-292.

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Lewis, A. (1954) "Economic Development with Unlimited Supplies of Labour" *Manchester Journal of Economics and Social Studies* 22: 139-191.

Malty, E. (1986) *Waterlogged Wealth: Why Waste the World's Wet Places?* London, Earthscan, IIED.

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Nigerian Environmental Study/Action Team (NEST) (2004) *Regional Climate Modelling and Climate Scenarios Development in Support of Vulnerability and Adaptation Studies: Outcome of Regional Modelling Efforts over Nigeria*, Ibadan, Nigerian Environmental Study/action Team.

Nkonya, E., D. Phillip, T. Mogues, J. Pander, M. K. Yahaya. G. Adebowale, T. Arokoyo and E. Kato (2008) *From the Ground Up: Impacts of a Pro-poor community-driven Development Project in Nigeria.* International Food Policy Research Institute (IFPRI) Discussion Paper 00756, Washington DC, IFPRI.

Wise use of wetlands is the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development (Ramsar Convention on Wetlands: www.ramsar.org).

Mr. Chairman, ladies and gentlemen, if God gives you lemon, make lemonade out of it. Nigeria is endowed with abundant wetlands. It is estimated that 2.8-7.2% of the country's land area is wetlands (Ojanuga, Lekwa and Okusami, 2003). NEST (1991) estimates indicate that Nigeria has a total of 2,996,150 hectares of wetlands made up of 858,000 of hectares mangrove swamps and 2,138,150 hectares of floodplains (Table 3). Some coastal states in Nigeria are virtually wetlands. For instance, 31.6% of the land area of Akwa Ibom State is wetland (DHV Consultant BV, 1995). The entire periphery of the State would have been swamps were it not for part of the Western boundary between Imo River and Enyong Creek which is dryland in most parts (Table 4). If Nigeria is endowed with wetlands, we should make a decent and sustainable living out of it. We must utilize wetlands to meet our developmental needs in all its ramifications be it food, recreation, technology, science, sports, etc. But this must come through a sustained planning and implementation of wetlands development policies, programmes and projects.

Table 1: Contribution of Wetlands to Household Food Supply (Monthly)

Source of Food	Quantity (in Grains Equivalent)	%
Purchase	443.80	10.30
Upland Farms	1438.60	33.40
Wetlands	2426.00	56.30
Total	**4308.40**	**100.00**

Source: Umoh, G. S. (2008)

Table 2: Comparison of Yields of Selected crops from upland and wetlands

Type of crops	Wetland	Upland
	Yield	Yield
Fluted Pumpkin	7.63	2.5
Cassava	10.04	8.0
Cocoyam	15.87	5.0
Okra	8.98	6.0
Maize	7.27	3.7

Source: Edem, S. O; Effiong, G; Umoh, G. S. (1998)

Table 3: Distribution of wetlands in Nigeria

Coastal Saline Wetlands (Mangrove Swamps)		Freshwater wetlands (flood plains)	
Name	Extent (Ha)	Name	Extent (Ha)
Niger Delta	617,000	Niger Delta	1,177,000
Cross River Estuary	95,000	River Niger	8,150
Imo River & Qua Iboe		River Benue	242,000
River Estuary	36,000	Cross River	250,000
Others	110,000	Imo River	26,000
		Lake Chad	55,000
		Ogun/Osun Rivers	380,000
Total	**858,000**		**2,138,150**

Source: Adapted from NEST (1991) Nigeria's Threatened Environment: A National Profile

Idachaba, F. S. (2000) Desirable and Workable Agricultural Policies for Nigeria in the First Decade of the 21st Century. In: *Topical Issues in Nigerian Agriculture* Department of Agricultural Economics, University of Ibadan.

Inang, E. E. and G. E. Ukpong (1992) A Review of Small-scale Credit Enterprises in Nigeria. *Economics and Financial Review* 30(4): 249-279.

Inoyo, U. (2014) Challenges and Opportunities for University Graduates in a "season of Economic and Moral Decay". An Address Delivered at the 19th & 20th convocation of the University of Uyo, 21, November.

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Grove, A. T. (1985) *The Niger and Its Neighbour: Environment, History, Hydrobiology, Human Use and Health Hazards of the Major West African Rivers*, Belkerma, Rotherdam.

Gwarry, D. M. (1995) "Sustainable Food Production through Fadama Farming in the Semi-Arid Zone of North Eastern Nigeria". A Paper Presented at the 11th Annual Conference of Farm Management Association of Nigeria, Uyo, 10-12 October.

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Heger, M; A. Juka, and O. Paddison, (2008) Analysing the Impacts of Natural Hazards in Small Economies. UNU-WIDER Research Paper No. 2008/25. Online at www.wider.unu.edu. Accessed 28/10/2008.

Table 4: Proximate Wetlands locations and Areas in Akwa Ibom State

S/N	Approximate Location	Area (km^2)	Percentage of total land in the State
1	Mbiabet	62.5	0.9
2	Use	81.3	1.3
3	Ayadehe	125.0	1.8
4	Nwaniba	312.5	4.4
5	Ebughe	193.8	2.9
6	Etebi	331.3	4.7
7	Okore Ete	350.0	5.0
8	Ukam	75.0	1.0
9	Floodplains of all rivers and streams (except Ubium creek)	468.8	6.7
10	Nkana	87.5	1.2
11	Nung Obong	68.8	0.9
12	Ebam Ukot/Ekoi	63.0	0.8
	Total	**2219.5**	**31.6**

Source: DHV Consultant BV, 1995

4.0: THE DEVELOPMENT OF WETLANDS AGRICULTURE IN NIGERIA.

This section is devoted to the second of the twin object of my lecture- the development of wetlands agriculture in Nigeria. The focus is on public/government efforts. This is informed by the extant roles that government is expected to play in the various sectors and sub-sectors of the economy and ultimately on national development.

Records show that several Nigerian administrations have attempted to bring about improvements in wetlands agriculture and ultimately the welfare of wetlands farmers such as Mrs. X. Clearly, these efforts have come in various shapes and forms reflected in the mandates/foci, targets, approaches, scopes, durations, funding, extent of implementation and impacts on the beneficiaries.

The summary of these programmes and projects is presented below.

4.1: Wetlands Agriculture Development as a Crop Production Project

Between 1930 and 1970, two attempts were made to develop wetlands agriculture in Nigeria. The first was in 1933 by the colonial administration. It consisted of rice cultivation trial with sites in the mangrove swamp at Calabar, Oron, Warri, Mbiakpapa, Oloibiti and Oloibiri (Onofeghara, 1986). The project focus was on crop (rice) production. In all, about 500 hectares was used in the experiment.

According to the West African Rice Development Agency (WARDA, 1954), yields in small plots at Calabar averaged 2700kg per hectare in the first cropping year. On low mangrove lands at Warri and Oron, yields were low ranging from 1410 to 1600kg.

In 1963, the Niger Delta Development Board commissioned Brian Anderson to conduct a study of the soils of the Niger Delta Special Area, ostensibly to establish its suitability for wetlands agriculture development. Mr. Anderson submitted his report in 1967 and stated in the Introduction:

A study of the soil of the Niger Delta Area was carried out between January, 1963, and June, 1966….It is mainly a factual account of the properties and composition of the soils. But since the study was intended to assist in the agricultural development of the Special Area, this report includes some observations on present farming systems and there are also suggestions about future development (Anderson, 1966).

Doss, C. R. and S. Taff (1996) "The Influence of Wetlands Type and Wetland Proximity on Residential Property Values" *Journal of Agricultural and Resource Economics* 21(1): 120-129

Dwivedi, D. N (1980) *Managerial Economics*, New Delhi, Vikas Publishing House PVT Ltd.

Easterly, W. and R. Levine (1997) "Africa's Growth Tragedy: Politics and Ethnic Divisions". *Quarterly Journal of Economics* 112(4, November): 1203-1250.

Edem, S. O., G. S. Effiong and G. S. Umoh (1998) "The Wetlands of Akwa Ibom State: Utilization and Present Land Use Practices". *Nigerian Journal of Agricultural Technology* 7: 13-24.

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Food and Agriculture Organization (FAO) (2008) *Wetland Classification and Characterization for Sustainable Agricultural Development,* Harare, FAO Sub regional Office for East and Southern Africa.

Bassey, E; G. S. Umoh, N. U. Ndaeyo, N. E. Nneke and G. U. Akpan (2016) Investigation into Yaro [Colocasia esculenta) (L) Schott] Leaf Blight Outbreak and Identification Resistant Cultivars in Akwa Ibom State, Nigeria. International *Journal of Current Research in Biosciences and Plant Biology.* 3(5): 137-143.

Bayliss-Smith, T. and J. Golson (1992) Wetland Agriculture in New Guinea Highlands Prehisory. In: B. Coles (ed) *The Wetland Revolution in Prehistory*. Pp15-27, Exter, Uk, The Prehistory Society and WARP, University of Exter.

Central Bank Nigeria (CBN) (2012) *Statistical Bulletin,* Abuja, Central Bank of Nigeria.

Denevan, V. M. (1982) *Hydraulic Agriculture in the American Tropics: forms, Measures and Recent Research.* In: K. V. Flannery (ed) Maya Substance. Pp 181-204, London, Academic Press.

DHV Consultant BV (1995) Northern Akwa Ibom Swamps Resources Development Study Final Report, Uyo, Akwa Ibom Agricultural Development Project.

Dittoh, S. (1994) Critical Issues in Planning for Sustainable Agricultural Development in Nigeria. A Seminar Paper presented at the Centre for Econometric and Allied Research, University of Ibadan.

Dittoh, S. and D. Akatugba (1988) The Politics and Economics of Food Policy Planning and Implementation in Nigeria. In: Sanda , A. O. (ed) Corporate Strategy for Agricultural and Rural Development in Nigeria, Obafemi Awolowo University, Ile Ife.

To date, I have not come across any document that shows that the trial rice project continued thereafter or the Anderson Report was implemented. The project ended as a "trial" and the report was another good document gathering dust on the shelf.

Mr. Chairman, ladies and gentlemen the two attempts just described marked the beginning of a tortuous journey which wetlands agriculture was to make in Nigeria. This journey has caught many unsuspecting wetlands farmers unaware. And, some like Mrs. X have paid the supreme price!

4.2: Wetlands Agriculture Development as an Irrigation Project I

After the failed attempts of 1963 and 1967, the second episode of wetlands agriculture development was the promulgation of a decree establishing 11 River Basin Development Authorities (RBDAs): Sokoto- Rima, Hadejia-Jamaare, Chad, Upper Benue, Lower Benue, Cross River, Anambra- Imo, Niger, Ogun-Osun, Benin-Owena and Niger Delta River Basin Authorities in June 1976. This time around, the focus was on the development of wetlands agriculture through irrigation facilities.

The RBDAs were charged with the function of developing both surface and underground water resources for multi-purpose use:- controlling of floods and erosions and managing watersheds, developing irrigation schemes for the production of crops and livestock,

constructing and maintaining dams, dykes, polders, wells, boreholes, irrigation and drainage systems; and providing water for reservoirs, wells and boreholes, among others. Since inception, the RBDAs have been reorganized and restructured 3 times. In 1984, the number of RBDAs was increased from 11 to 18. In 1985, the word "Rural" was added to the name to become River Basin and Rural Development Authorities (RBRDAs). They were, thus expected to undertake actions on the improvement of the quality of life of the people. Again, in 1987, the number of RBRDAs was reduced to 9. Commentators on the state of affairs of RBRDAs (Sanda, 1992; Dittoh and Akatugba, 1988; Umoh, 2000a) maintain that (i) the project was not originally a Nigerian idea (ii) government's venture into the river basin development was inspired by the success of the Tennessee Valley Authority in the USA in integrated river basin planning, and Nigeria's involvement in Lake Chad and Niger Basin Commission (iii) bureaucrats in Government were attracted by the heavy foreign exchange component of the project. Given the lack of originality in the concept of RBRDA in Nigeria, passion, commitment and focus would not be expected in its implementation.

It is, therefore, not surprising that the performance of the River Basin and Rural Development Authorities has come under serious criticism. The Nigerian Environmental Study/Action Team (NEST, 1991) describes the performance of RBDAs thus:

Aminu-Kano, M. (1994) "Sustainable Water Resources Development in the Komadugu-Yobe Basin" A Paper presented at the National Symposium on Water Resources and Rural Development, organized by the Federal Ministry of Water Resources and Rural Development, Kano, 5-11 June.

Anderson, B. (1967) Report of the Soils of the Niger Delta Special Area, Port Harcourt, Niger Delta Development Board. Pp: 69.

Anyanwu, J. C. (1997) "Economists and Institutions in Economic Policy Making in Nigeria: In: *Why Have Economic Policy Failed in Nigeria?* Proceedings, Nigerian Economic Society, pp 19-33.

Aron, J. (2000) Growth and Institutions: A Review of the Evidence. The *World Bank Observer* 5(1): 99-135.

Auffret, P. (2003) High Consumption Volatility: The Impact of Natural Disasters. *World Bank Policy Research Working Paper,* 2962. Washington DC, World Bank.

Ayeni, J. S. O; A. A. Adeniji, A. N. Okaeme, E. O. Obot and S. O. Otubusin (1990) "Utilisation and Development of Nigeria Wetlands". In: , Akpata, T. V. I. and D. U. U. Okali (eds) *Nigerian Wetlands*. Proceedings of Man and the Biosphere (MAB), National Committee, Nigeria. UNESCO National Commission, Federal Ministry of Education.

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Akpaeti, A. J. and Umoh, G. S. (2015) Conflict, Technical Efficiency of Resource Poor Farmers: A Stochastic Frontier Analysis. *Russian Agricultural Sciences* 41(4): 299-304.

Akwa Ibom Agricultural Development Project (AKADEP, 1994) Proposal for the National Fadama Development Project for Akwa Ibom State (1996-1997), Uyo AKADEP.

In practice, the performance of the RBDAs is disappointing. They have tended to focus on large-scale single-purpose projects with a large and expansive engineering element, especially irrigation schemes. Each RBDA developed large and inefficient bureaucracies while most of its functions were neglected. The RBDAs have failed to provide a viable framework for rural development based on water resources management.

4.3: Wetlands Agriculture Development as Irrigation Infrastructure Project II

The RBRDAs were followed by National *Fadama* Development Project (NFDP). NFDP commenced in 1992 and has been implemented in phases. The project was inspired and designed by the World Bank. Unlike RBRDAs that focused on large-scale irrigation facilities, emphasis of the NFDP was on small scale irrigation. NFDP phase I was to provide boreholes and pumps to crop farmers through simple credit arrangements aimed at boosting aggregate crop output.

It was implemented from 1992 to 1996 in 5 States of Nigeria -Kano, Sokoto, Bauchi, Kebbi, and Jigawa. The target objective was to construct 50, 000 shallow tube wells (by drilling and wash boring) amounting to US$105.9m with a World Bank loan of US$67.5m. The remaining amount of US$38.4m was to be contributed by the Federal and State governments and the farmers.

True to the characteristic Nigerian approach to project implementation, the focus and approach to the NFDP implementation was to change after the first phase. This was without due regard to the farmers who would have invested their meagre resources in the project and required mentoring and more support to stay in the business of farming. An evaluation study funded by International Food Policy Research Institute (IFPRI), the main agency representing the World Bank's interest in the Nigeria Fadama Project (Nkonya, Phillip, Mogues, Pender, Yahaya, Adebowale, Orokoyo and Kato, 2008), was to report that: (i) NFDPI did not emphasize support for rural infrastructure such as rural road which is critical for the disposal of *fadama* farms produce, (ii) It neglected post production activities such as processing, storage and marketing, (iii) All these contributed to reduced crop prices and increased storage losses. My conclusion on this is that the design of NFDPI revealed a lack of understanding of the peculiarity of fadama farming and fadama environment, probably, because the policy was externally inspired with little or no inputs from those whose livelihood come from the fadama or who have been in the fadama environment long enough to understand the real challenges confronting their livelihoods-fadama farming (Umoh, 2013).

4.4: Wetlands Agriculture Development as Poverty Alleviation Project I

Again, Nigeria was to display inconstancy in wetlands agriculture development by changing the focus and mandate of the National Fadama Development Project.

Second is Mrs. Flora Ubom, my Aunty, who, together with her husband, Prof. Rufus Ubom, “mothered and fathered me” while in Uyo. It was she and her husband who made it possible for me to gain admission into the then Unicross for my First Degree programme, and to take up the offer for postgraduate studies at the University of Ibadan.

The last but not the least is my dear wife, Mrs. Nsikak Gabriel Umoh, PhD, a paragon of beauty combined with brains. I hereby publicly acknowledge your inestimable love and support as major ingredients in my scholarly progress and achievements. I would not have asked for a better wife! And, lastly, when all is said and done, ultimately to God be- all- the -GLORY!!!

Thank you for your patience and attention.

One man has a special place in the history of my foray into international consultancy and development practice. This man is Prof. Imoh Ukpong. It is he who introduced me to international consultancy and has remained a very faithful and unassuming supporter of all I do. Prof, thank you so much.

I thank my brothers and their wives and children – Akpan Sunday, Monday, Ekerete and Ofonime for their support and love. To all my brothers and sisters that I have the privilege of sharing similar understanding of the God of our hearts, I appreciate your positive thoughts and influences.

My unreserved appreciation goes to my children-Inemesit, Emineimo, Ifiok, Ufonemem and Utibeima for enduring my absence from home either for academic work or development practice. I particularly acknowledge my father – the late Elder Sunday Peter Umoh – for the training, discipline and sterling character traits he imparted to me.

Mr. Chairman, ladies and gentlemen, this Inaugural is dedicated to three women who have left indelible marks in both my life and academic pursuits. First is my mother, Madam Esther Sunday Umoh, who stood solidly behind my father to make sure her children were all trained in their chosen fields of interest. She, on instances–offered herself as farm labour to raise money for our feeding and school fees. Mma, *sosongo*.

It started as an irrigation improvement facility extended to only fadama farmers (Fadama Users through the Fadama Users Association- FUA). However, in 2005, the second phase of the project was launched with a focus on poverty alleviation and expansion to 12 States including the Federal Capital Territory (Adamawa, Bauchi, Gombe, the Federal Capital Territory, Imo, Kaduna, Kebbi, Lagos, Niger, Ogun, Oyo and Taraba). By this shift, it was to empower the fadama users to become more productive and richer through their farming efforts with the enabling assistance of government in the form of credit and infrastructure.

Implemented from 2005 to 2010, it had 5 components namely: (i) Rural infrastructure (ii) Pilot Productive Asset Acquisition Support (iii) Demand-responsive Advisory Services (iv) Capacity Building and (v) Conflict Resolution.
National Fadama II project was a clear digression from the original intent and purpose of the National Fadama Development Project. Instead of addressing the peculiar needs of the fadama farmers in a consistent manner in the long term, it was to serve the interest of the international supporters - (i) poverty alleviation and (ii) private sector- led economy.

4.5: Wetlands Agriculture Development as Poverty Alleviation Project II

Following on the heels of Fadama II was the third National Fadama Development Project (NFPDIII). It began in 2010 and was implemented in the 36 States of Nigeria including the Federal Capital Territory (Abuja).

The project was designed to support the implementation of Nigeria's economic growth and poverty alleviation strategy as outlined in the Nigeria Economic Empowerment and Development Strategy (NEEDS). Fadama III was designed to transfer financial and technical resources to the beneficiary groups through: institutional and social development, physical infrastructure for productive use, transfer and adoption of technology to expand productivity, improved value-addition and conservation of land quality, support to extension and applied research, and providing matching grants to access assets for income –generation and livelihoods improvements.

I have never seen a project that has moved away from its original concept and beneficiaries as the National Fadama III Project! It is only carrying fadama in name but not in implementation. Every person and community, both upland and wetland is supposedly a target beneficiary of the project. Activities not directly related to agriculture, such as rental services, are supported. Special attention is even paid to groups with peculiar needs/challenges e. g. the physically challenged and the widows who, in most cases, have nothing to do with wetlands agriculture. It is common to see Fadama III signposts located in the heart of the cities which are nowhere near wetland environment.

Mr. Chairman, revelations from my analysis of public/government efforts in wetlands agriculture development can be summarized as follows (also see Table 5):

You have provided me the opportunity to put into practice my learning in group dynamics, leadership, human resources management and how to be a team player. The non-teaching staff in the Department, Faculty and indeed the entire University have always been nice to me, this I appreciate.

I particularly thank Drs. Joseph Ushie and Happiness Uduk for their assistance in editing this lecture. The non-teaching staff in the Department of Agricultural Economics and Extension served me and the University diligently at the two instances I was appointed Head of the Department, which interestingly all coincided with the NUC Accreditation exercises. I must, at this time, acknowledge my excellent staff at the Centre for Wetlands and Waste Management Studies- Felix Nsikak, Ime Obong, Ukeme Humphrey Essien and Ndifreke Isaac. Keep up your excellent work. You will earn your reward accordingly.

To you, my students, past and present, in the Department of Agricultural Economics and Extension, and Centre for Wetlands and Waste Management Studies, thank you for trusting in me. Keep trusting in me. I will continue to inspire you to greatness.

My schooling and life generally received support both materially and morally from a number of persons to whom I remain eternally grateful. On this count, I thank Prof. Rufus Ubom, Hon. Ekuyik Ekong, my cousin – Bishop Sampson H. Umoh and Otuekong Nelson Essien. Otuekong Nelson Essien, you may not have given me so much money, but you gave me at every stage, something more than money – the courage to push on. You are *Otu Ekong* indeed, the *Generalissimo* of Ikot Ukpong Iman!

I am particularly grateful to Prof. A. J. Udoh- my teacher, who was the Head of Department of Agricultural Economics and Extension when I applied for the job in the University. When I told him of my interest to join the Department, he simply said to me: "I will recommend you, if you apply". And he did. Sir, I know you will be happy that I am growing in that spirit, i.e. recommending brilliant students to return to the Department. I acknowledge Prof. Yakub L. Fabiyi who took over from Prof. A. J. Udoh as HOD and who, when I was offered employment by Uniuyo, ensured that I continued with my M.Sc. programme to completion at the University of Ibadan. I also appreciate Prof. Fola Lasisi, a very liberal-minded University administrator, who employed me in the University of Uyo.

I recognise the moral, mental and psychological support of my teachers at all levels of education, especially my former teachers, at the University of Cross River State (now University of Uyo), Prof. B. Ndon, Prof. O. J. Ifut, Prof. T. O. Ibia, Prof. Etok Ekanem, Dr. S. O. Edem, Dr. E. U. U. Ituen, Prof. Akaneren Essien. These demi-gods have always, at all occasions I meet with them either individually or as a group expressed their joy in my progress. I thank you all for guiding me through the early stages of my academic career.

My colleagues, academic staff in the Departments of Agricultural Economics and Extension and the Faculty of Agriculture as well as the University of Uyo as a whole are hereby acknowledged for being there for me.

- Wetlands agriculture development has been inspired by external agencies- foreign consultants, World bank, successes in Tennessee valley project in the USA, regional institutions e.g. Lake Chad Basin, etc.

- there is over dependence on external agencies for funding and guidance;

- there is persistent policy inconsistency, incoherence, inconstancy and instability;

- planners and implementers of wetlands agriculture policies and programmes seem insensitive to the fact that wetlands agriculture development projects have direct impacts on human beings-their livelihood, income and overall wellbeing, and that frequent changes in concept and focus have adverse effects on the target beneficiaries.

Table 5: Wetlands Agriculture Development projects

Project	Focus/aim	Spread/ Coverage	Source(s) of Funds	Duration
Varietal Trial	Crop Production (Rice)	Niger Delta	Colonial Government	1933-?
River Basin Development Authority	Irrigation Infrastructure provision	National	FGN, World Bank	1976-date
National Fadama Development Project I	Irrigation Infrastructure provision	5 States	FGN, Participating States, World Bank	1992-1995
National Fadama Development Project II	Poverty Alleviation	12 States	FGN, participating States, World Bank	2008-2013
National Fadama Development Project III	Poverty Alleviation	36 States and FCT	FGN, Participating States, World Bank	2010-2015 with 1 year extension

5.0: WHY DID MRS. X DIE?

How did the development of wetlands agriculture by government just narrated affect the wetlands farmers? In short, why did Mrs. X, first, a human being and second, a wetlands farmer die? In this section, I wish to present some of the researches and development works I have done for the past 2 decades which qualify me as a Professor of Agricultural and Development Economics. These works provide answers to the question: Why Did Mrs X Die?

5.1: Leadership and Governance Failure

Mr. Chairman, I have sketched above, the chequered and tortuous history of the development of wetlands agriculture in Nigeria. One thing is clear, the development of a nation or the sectors of the economy of a nation is, to a large extent, predicated on its leadership. Yuki (2010) defines leadership as both a "process of influencing others to understand and agree about what needs to be done effectively, and the process of facilitating individual and collective efforts to accomplish the shared objectives". Effective leadership combined with good governance is necessary for sustainable development. Sadly, several studies have confirmed that leadership problem has hampered Nigeria's progress in all spheres of life be it political, economic, military and/or socio-cultural (Ogundiya, 2009; Ojukwu and Shopeju, 2010; Ogbeidi, 2012). Since independence in 1960, Nigeria's history has been characterised by poor governance, military and civilian alike.

I started looking for the answer to the question of the impacts of governance and leadership on the growth and development of Nigerian agriculture in 2001 by investigating the effects of

7.0: MY FUTURE RESEARCH FOCUS

Mr. Chairman, ladies and gentlemen, research on wetlands agriculture is still at its infancy. A lot still remains to be done and achieved. The lumping of wetlands agriculture development with the general development progammes by successive Nigerian administrations only confirms the lack of focused attention on wetlands agriculture.

Therefore, I intend to continue with wetlands agriculture albeit with a slant towards institutions and leadership which influence policies and programmes. The wetlands farmers have not been heard. Thus, their needs are not addressed. I intend, therefore, to deploy my development practice skills and knowledge to work with wetlands farmers until their voice is heard in Nigeria and beyond!

8.0: ACKOWLEDGEMENTS

I am glad to stand on this ground today to present the 50th Inaugural Lecture of the University of Uyo. Thirty years ago, I stood on this ground, in what was then called the Pavilion, as a student to receive lectures. Today, I stand as the first alumnus (First Degree Graduate) Professor of the University of Uyo to deliver my Inaugural Lecture. I am also the first alumnus from the Faculty of Agriculture as well as Department of Agricultural Economics and Extension to do so. I thank all my lecturers for transforming me into what I have become. Today, I also thank the Vice Chancellor for giving me this opportunity to present this lecture at this time- The GOLDEN Inaugural Lecture.

(4) Agricultural institutions need to be strengthened to address the problems of wetlands farmers. Researches in our universities and other institutions should respond directly to the problems of our immediate environment, including wetlands agriculture.

(5) Interventions/supports to the agriculture sector should take into cognizance the peculiar nature and needs of wetlands agriculture particularly with regards to timely delivery of interventions.

(6) The University of Uyo Centre for Wetlands and Waste Management Studies should be adopted as National Centre of Excellence on wetlands research and development. The University of Uyo has more than enough human resources to deliver on wetlands development including on wetlands agriculture development. The Centre is creating research clusters including Wetlands Agriculture Research Cluster (WARC) to address the peculiar issues of wetlands agriculture.

(7) Nigeria as a country should have a vision for wetlands agriculture; a vision with SMART (specific, measurable, achievable, realistic & time-bound) objectives. The vision should not change with a change of government/administration.

Wetlands agriculture development policies and, indeed, Nigeria's economic development policies must address three eternal goals. These are
(i) Peace (ii) Health and (iii) Happiness. In this way, more Mrs. X. will not die!

government type and policies on the growth of agriculture (Umoh, 2001a).The study, published in the prestigious Nigerian Journal of Economic and Social Studies, found that regimes that lasted longer had more agricultural policies/programmes. This also brought about higher agricultural growth in the sector. However, the study also found instability in agricultural growth arising from political and policy instability. The disposition displayed by Nigerian leaders could be influenced by two crucial factors: leadership mindset and celebration of failures.

Leadership Mindset: The policy formulated and implemented could be a function of the mindset of the leader. There are two prevalent mindsets in life: The hunter and the farmer mindset. These mindsets influence our approach to personal as well as state/public businesses. The skillful hunter has the ability to locate a prey, pursue, deal the deadly blow and gather the kill. In spite of these qualities, the skillful hunter has a limitation in that he hunts one animal at a time, while equating this activity with productivity. In other words, the skillful hunter spends time to hunt instead of utilizing his time to improve efficiency. He hunts for new prey every day with the assumption that animals will always be available. He is, however, not focused and not good at follow-through. The skillful hunter may be well educated and could innovate. But he is a hunter and, like a chaser only chases finished products to kill.

On the other hand, the skillful farmer has the ability to plan, nurture, innovate, improve and progress. He is a master planner. He turns challenges to opportunities for growth.

The skillful farmer is committed to achieving success in all his endeavours. He is regarded as a technocrat when he subordinates politics to technical, professional and managerial abilities in managing resources to achieve national objectives.

The frequent and sometimes rapid changes in wetlands agriculture development policy programme and projects only portray a mindset that is not ready to plan, nurture, innovate, improve and progress but only interested in harvesting where it did not sow (Adegeye, 2000).
The focus and mandates of the River Basin Development Authorities have been changed several times. The case of the National Fadama Development Project also reveals this hunter mindset in wetlands agriculture development. From a purely irrigation infrastructure project at inception, it has been turned to a poverty alleviation project despite the existence of other such programmes in the country at both the national and state levels (NAPEP, etc).

Rather than toeing the path of a skilful farmer by consistently planning and improving on the provision of the much needed irrigation facilities for all-year-round agricultural production in the country, poverty reduction became the "attractive new prey".

Mr. Chairman, the hunter mindset just described sadly fits the description of Nigerians/Africans, written almost a century ago by Lord Frederick Lugard (1922),

The time has, therefore, come for Nigeria to take its wetlands agriculture development by its hands. We must invent and make discoveries, not by copying but by looking inward! Our development should derive from our culture and from those things we have been doing and we know how to do. We must begin from here and improve them, dropping what we find not to be good but advancing those that serve our purpose.

(2) Agricultural training in tertiary institutions in Nigerian should be overhauled. The curricula should emphasize agriculture as a business to be practised as do graduates of medicine and pharmacy. Hands-on training is important. Therefore, the lecturers/teachers require retraining to be brought to the level they can impart knowledge and skills that can serve the 21st century economy.

(3) To remove the structural causes of dependency mind-set, liberation courses should be offered in Nigerian tertiary institutions and other levels of education. These courses should be such that will transform the learners from dependency mind-set to self-trusting. Such courses should include but not be limited to Liberation Economics, Liberation Sociology, Liberation Religion. These courses, which should be compulsory for all students, should be designed to make the students and teachers learn to think independently, to be capable of deriving their conclusions and inferences from critical thinking on observations of their immediate and wider environments, rather than on depending on the so called international "best practices" as their yardsticks. This way knowledge and skills could be built up in a sustainable manner because they emanate from us.

(3) Agriculture supporting institutions (Ministries, Departments and Agencies) lack the capacity to adequately respond to the problems faced by wetlands farmers. They are not providing wetlands farmers with relevant information and technical assistance to meet their peculiar needs;

(4) Production inputs are not available to wetlands farmers at the right time, right quantity and quality;

(5) Highly trained hands in agriculture do not ply their skills and knowledge in the agricultural sector;

(6) Due to the above and other reasons, the wetlands farmers are operating at sub-optimal production level and less efficient in the use of available production inputs/resources. The ultimate effects are as manifest in Mrs. X's death.

Therefore, to save Mrs. X and her ilk, to bring about sustainable development of wetlands agriculture in Nigeria, it is recommended that:

(1) There should be home-grown policies that will ensure steady focus on the development of wetlands agriculture in Nigeria. We must seize the initiative and change our ways of thinking by developing wetlands agriculture and our economy. Copying and imitating others have not, for the past over thirty years, developed our wetlands agriculture.

the first Governor General of Nigeria in *The Dual Mandate of British Tropical Africa*, and equally still fits Nigeria of the 21st century:

> *In character and temperament, the typical African… is a happy, thriftless, excitable person, lacking in self-control, discipline and foresight. Naturally courageous, and naturally courteous and polite, full of personal vanity with little sense of veracity, fond of music and loving weapons as an oriental loves jewellery.*
> *… His thoughts are concentrated on the events and feelings of the moment, and he suffers little from the apprehension for the future or grief for the past…*
> *… He lacks the power of organization, and is conspicuously deficient in the management and control alike of men and business.*
> *… he loves the display of power, but fails to realize its responsibility… he will work hard with less incentives than most races…*

Celebrating Failures: The more troubling of this leadership mindset to development is the penchant for celebrating these failures. Often you hear managers of these programmes and projects report their "successes" with fanfares if there is nothing more to add. So long as all of us- our leaders, policy makers, administrators of public affairs, teachers, traditional leaders and community members continue on ego trip, so long will the experience in the wetland and agricultural sector as a whole continue. Playing to the gallery produces fake characters, fake policies, fake plans, fake implementers and fake outputs and outcomes.

So long as we pay more attention to celebrating "our growth", so long will the craving and temptation to fake achievements continue. The ultimate impact of this is that our society will lack sustainable development!

Mr. Chairman, to get out of the present regrettable situation in wetlands agriculture development, Nigeria requires the leadership that matters. Sashkin and Sashkin (2003) in their famous book, *Leadership that Matters*... say that leadership that matters does so because it makes a difference. This difference occurs in the lives of followers, in a group or organization. There is also a difference in group or organization performance. There is an important difference in the organization itself as a result of leadership that matters.. If Nigeria has had the leadership that matters at all levels of wetlands agriculture development, perhaps, the title of my Inaugural Lecture would have been something different!

Let me be quick in pointing out that the other subsectors of agriculture and indeed the entire agricultural sector have suffered the same fate as the wetlands subsector.

We recall some flagship agricultural policies and programmes which are now history in Nigeria but such have been the pillars of agricultural transformation in other climes. These include the National Accelerated Food Production Programme (NAFPP, 1975), Operation Feed the Nation (OFN, 1976), Green Revolution (GR, 1980), Rural Banking Scheme (RBS, 1978), National Land Development Agency (NALDA, 1988), etc (Table 5).

Mr. Vice Chancellor, this Lecture might have well been titled "The Tragedy of Copying". But instead of what in nature would have been a very general title, I had to rather settle for a topic which would make for soul searching by all of us. Yes, searching for what we have done or have not done either as individuals, organizations or as a country that keeps wetlands agriculture underdeveloped and wetlands farmers impoverished, poor, and vulnerable to all kinds of risks – climatic/environmental, health/diseases, policy/political, etc. Nigeria has been copying either from other countries, programmes or external institutions when indeed these ideas are available within Nigeria, and, the results are the crises rocking the country today. Having said this, we can conclude from this Lecture that:

(1) the policies and programmes for the development of wetlands agriculture have been inspired by external agencies.

(2) there have been consistent shifts in the focus, targets, scope and scale of wetlands agriculture development policies often leading to bypassing or exclusion of the initial target beneficiaries – the wetlands farmers.

These programmes, with all the foreign contents and practices, have largely failed to address the needs of the Nigerian farmers. The *big picture* of wetland agriculture as seen by external agencies may be blurred by their business interests rather than that of the wetlands farmers. The outcome has been policy inconsistencies and diversions of resources meant for wetlands agricultural development.

This will meet the country's domestic needs with leftovers for export. Akwa Ibom Agricultural Development Project (1995) reported that estimated potential fadama land available for agriculture in Akwa Ibom State is 51,000 hectares excluding forested zones. With a production of 5 tons per hectare, Akwa Ibom State alone will produce 255,000 tons of rice per annum. This is the extent to which wetlands agriculture can contribute to the food needs and indeed the development of Nigeria as it did in ancient Egypt. However, while ancient Egypt's government exhibited determination, persistence, foresight and consistency, this has not been the case with Nigeria. Nigeria is, unfortunately, busy investing in what it does not consume and consuming what it does not produce. This is a real paradox. To change this paradox, we must think outside the box!

6.0: CONCLUSIONS AND RECOMMENDATIONS

In every work of genius we recognize our own rejected thoughts: they come back to us with a certain alienated majesty: Great works of art have no more affecting lesson for us than this. They teach us to abide by our spontaneous impression with good-humoured inflexibility and mostly when the whole cry of voices is on the other side. Else, tomorrow a stranger will say with masterly good sense precisely what we have thought and felt all the time, and we shall be forced to take with shame our own opinion from another. –

Waldo Emerson (1803-1882)

Table 6: Selected Flagship Agricultural Policies and Programmes in Nigeria and their Current Status

Policy/Programme	Year Started	Current status(as at 2016)
Agricultural Development Projects (ADPs)	1972	On-going, but implemented by States
National Accelerated Food Production Project(NAFPP)	1975	Discontinued
River Basin Development Authorities (RBDA)	1976	On-going but with less steam and narrow focus
Rural Banking Scheme	1978	
Operation Feed the Nation (OFN)	1976	Discontinued
Green Revolution Programme(GRP)	1980	Discontinued
Directorate of Food, Roads and Rural Infrastructure (DFRRI)	1986	Discontinued
National Agricultural Land Development Authority (NALDA)	1988	Discontinued
National Fadama Development Project (NFDP)	1992	On-going but with a focus on poverty reduction
Growth Enhancement Support Scheme (GESS)	2011	?

5.2: Policy Formulation and Implementation

Policy is the statement of intent of government on actions and activities to either bring about growth and development or to bring a system or sector that is performing below normal to the expected level of performance. It is policy that gives rise to programme which in turn gives rise to projects and activities. For the agricultural sector, policies could aim at improving the welfare of the farmers and others whose livelihoods, income and wellbeing depend on the sector.

Policy Formulation:
Several studies have shown clearly that policy making and implementation has been one of the fundamental reasons for the malfunctioning and failure of the Nigerian economy. Iwayemi (2012) contends that public policy design and implementation failures exacerbate weak and dysfunctional institutions leading to sub-optimal development.

Idachaba (2000) identified the problem of agriculture in Nigeria as arising from the design and implementation of unworkable agricultural policies. Undesirable agricultural policies were at the centre of Nigeria's agricultural decline during the period of the 1940s to 1990s.

Experience from these policies, programmes and projects has shown that there is no alternative to well designed, articulated and implemented agricultural policies as instruments for promoting agricultural growth and development in Nigeria.

Our studies (Umoh, 2003a) and (Umoh, Okon and Umoh, 2004) of the response of perennial crops and agricultural tradeables, respectively revealed the strong effects of policy instruments such as interest rates and exchange rates on the performance of Nigerian agriculture. The failure of agriculture to regain its position and play its traditional role raises several pertinent questions. Two of such questions are: Is agricultural policy making in Nigeria considered a serious business by policy makers?

In 2005, I used the Game Theoretic Model to try to determine these alternative courses of action i.e. the best crop combinations for wetlands farm given the risk associated with its cultivation. The model recommended the cultivation of rice as the best enterprise for wetlands (Umoh, 2005). The result was similar to our findings on the determination of optimal farm plan using a variant of Linear Programming Model called T-MOTAD (Target-Minimum of Total Absolute Deviation from the Mean) (Umoh, 2000a, 2005a, 2008c).

Mr. Chairman, ladies and gentlemen, Nigeria is passing through serious crises. There is economic recession. There is food crisis and other crises including crisis in the rice sector. Nigeria has banned and unbanned rice importation several times over. Yet rice import bill is mounting. Current estimates show that Nigeria imports $6m worth of rice daily (Ogbeh, 2016b) and about 3 million tons (worth ₦517.5 billion) annually. This is happening in the presence of abundant land, human and other resources for production of sufficient quantity of rice for the country.

Mr. Vice Chancellor, we do not need another Joseph to interpret the Nigerian dream of achieving food security. I stand here as the Joseph of today, not a dreamer but as a seasoned scientist, having researched into the world of wetlands for over decade, to predict that the way out of Nigeria's economic woes is in wetlands agriculture. As earlier stated, our models recommend rice as a crop for wetlands. With total wetlands of 2,996,150 hectares (NEST, 1991) and yield of 5 metric tons per hectare (Udoh, Ndon, Bassey & Ndaeyo, 2005), Nigeria can produce 14,980,750 metric tons of rice per annum. By putting only 30% of the Nigerian wetlands to rice cultivation, over 4million tons of rice can be produced per year.

Fig. 8: Prof. Gabriel Umoh taking photo of affected cocoyam along Calabar-Itu Road, Akwa Ibom State, Nigeria.
Photo Credit: Umoh G.S. (2013)

5.7 Thinking Outside the Box: Why Not Try Rice?

In Nigeria, many small-scale farmers in their wisdom and experience have always adopted mixed cropping as an insurance against crop failure (Adesimi, 1988). Farmers in our studies (Umoh, 2000a, 2015) admitted that they cultivate rice on wetlands as a risk management measure. They reasoned that swamp rice can thrive under waterlogged condition. They prefer the tall varieties such as MAS 2401 and IR 5 which cannot be easily submerged in water in case of flooding. Given the risks that are inherent in wetlands farming, farmers, such as Mrs. X as well as government and other stakeholders need to think outside the box. That is, look for alternative courses of action, new ways of doing things.

Or is it a serious business that is done unseriously? Put the other way, is agricultural policy making in Nigeria done by unserious persons? The questions become pertinent because policies are known to work in other countries. Development and growth achieved by most developed countries of Europe and the Americas and the industrializing countries of Asia derive from well formulated and implemented policies! (Ekpo, 2004)

We will now take a look at agricultural policy making in the various policy making eras in Nigeria. But before doing so, it is important to conceptualize who policy makers are in Nigeria, and what policy making is in order to put our discourse in proper perspective.

Who are Policy Makers? And what is Policy Making?

Policy makers are typically senior bureaucrats or politicians who take a number of policy initiatives (Anyanwu, 1997). Policy making on the other hand, is a complex and dynamic process used primarily by governments to decide the major guidelines for action
directed toward the future, and oriented toward what is in the public interest by the best possible means (See Dror, 1968 cited in Anyanwu 1997). Such could be to determine the allocation of resources, to distribute income and to promote growth. It involves manipulating a number of policy instruments in such a way as to achieve a set of predetermined targets.

The necessary steps in policy formulation include:

i) Policy idea;
ii) Policy formulation and articulation;
iii) Stakeholders Consultation;

iv) Refinement and modification of Policy (if necessary and depending on the outcome of consultation);
v) Policy Trial (Pilot Testing)
vi) Refinement based on the experience from the trial;
vii) Policy implementation;
viii) Monitoring of policy implementation;
ix) Evaluation of policy impact and,
x) Continuous and regular monitoring to ensure policy does not deviate from original intentions and that policy is revised in line with emerging realities.

This process could be applied to the entire economy or a sector of the economy. Therefore, agricultural policy making can be viewed as the process of manipulating relevant policy instruments with the aim of enhancing the growth and development of the agricultural sector.

Three most important units involved in policy making are the executive, the government bureaucrats and the legislature.

In dictatorships or military governments, the legislature exerts almost no influence on policy making. Nigeria is now under a democratic dispensation therefore the three vital players identified above are expected to be involved in agricultural policy formulation. However, from 1970 to 1999, policies were made by the Armed Forces Ruling Councils and Supreme Military Councils through military fiat, decrees and with "immediate effect". It was the executive that made policies with little or no inputs from the bureaucrats.

Fig. 6: Cocoyams affected by leaf blight,
Photo Credit: Umoh G.S. (2014)

Fig. 7: Cocoyam farmers, Abak, Akwa Ibom State.
Photo Credit: Umoh G.S. (2013)

Fig. 4: Field Experiment, University of Uyo Commercial Farm.
Photo Credit: Umoh G.S. (2015)

Fig. 5: Cocoyams affected by leaf blight,
Photo Credit: Umoh G.S. (2014)

Mr. Chairman, policy making, to my mind, is a very serious business. Substantial evidence abound to show that countries that have developed have achieved such feats through rigorous, far sighted and sustained policy formulation and implementation.

Ladies and gentlemen, in the year 2002, I attended the Salzburg Seminar on "Politics of Fresh Water: Addressing Fresh Water Scarcity" in Salzburg, Austria. The Seminar provided me and other participants the opportunity to inspect major water works in Salzburg. One of the water works consisted of spring water harvesting. Water is harvested from the top of a mountain and channeled to a reservoir and distributed to households. On enquiry about the duration of the construction of what could easily be regarded as an engineering feat, we were told that it took 15 years of consultation and 5 years of actual construction work to complete the project. This is one case of spending quality time to formulate project ideas before implementation. The water works stand as an evidence of good policy/project formulation and implementation.

The United States of America, Britain, France and other developed countries are known to take the business of policy making serious. The benefit of this is the status of developed and industrialized nations which they have attained today. What has been Nigeria's and Nigerians' attitude to agricultural policy making?

Pre-Independence or Colonial Agricultural Policy Making (Before 1960)

There is scanty information on pre-independence agricultural policy making in Nigeria. Nonetheless, some insight can be gained into the process through the writings and reports of colonial consultants on agriculture and economic development. Some of the outstanding policy advisers of that time include Arthur Lewis and Wolfgang Stoppler. Arthur Lewis was popular for his hypothesis of economic development with unlimited supply of labour. In the original Lewisian model, industry, via capital accumulation, provides the "engine of growth". To Lewis, the agriculture sector was important but plays a supportive and passive role, in the growth sense, by merely providing a pool of unlimited cheap unskilled labour for use in the industry.

Post War Agricultural Policy Making (1970-1985)

From 1966 to 1970, Nigeria was embroiled in a civil war which made serious development policy formulation difficult. Efforts were generally geared towards prosecuting the war. The post war years were associated with more agricultural policies than any other period preceding it. Understandably, this would have been to regain the lost years of the civil war. Both macro and micro economic policies were instituted. Some of them impacted negatively on agriculture while others were quite helpful to the sector. Interest rate (monetary policy) on agricultural loans was pegged at a maximum of 6% per annum in 1980. Interest rate in other sectors stood at 15% per annum.

Altogether, these compounds are required for maintaining healthy mucus membranes, skin and vision. The flavonoid in cocoyam helps to protect from lung and oral cavity cancers. The root of cocoyam has very good amounts of potassium which is an important component of cell and body fluids that help regulate heart rate and blood pressure. So, we encourage all to eat cocoyam, and wish the team well and give support so that it can find solution to the cocoyam problem and save the lives of many more Mrs. Xs!

Fig. 3: Screen House Experiment at the University of Uyo.
Photo Credit: Umoh G.S. (2013)

Besides community survey, we have conducted both screen house and field evaluations that have yielded preliminary results (see Fig 3-8). Some cultivars were found to show some degree of tolerance and resistance to the disease. We have so far shared our preliminary findings with the science community and policy makers first at a British Council-funded workshop (March, 2015) and a publication in International Journal of Current Research in Biosciences and Plant Biology (doi:http://dx.doi.org/10.20546/ijcrbp.206.305.021).
There is hope that with continuous evaluation and appropriate breeding and agronomic strategies, development of resistant cultivars in the nearest future is possible (Bassey, Umoh, Ndaeyo, Nneke and Akpan, 2016). The good news which we found in our literature search as well as community survey is that cocoyam may be the crop of the future due to its nutritional and medicinal values.

Cocoyam is known to have a complex carbohydrate known as *amylase* and *amylopectin*. The roots are very low in fats and protein than in cereals and pulses. The corms are free from gluten. They feature high-quality phyto-nutrition profile comprising dietary fibre, and antioxidants in addition to moderate proportions of minerals and vitamins. Together with slow digesting complex carbohydrates, moderate amounts of fibre in the food help gradual rise in blood sugar levels.

Cocoyam leaves as well as yellow-fleshed roots have significant levels of phenolic flavonoid pigment antioxidants such as *B*-carotenes and *cryptoxanthin* along with vitamin A.

The Nigerian Agricultural and Cooperative Bank (NACB) was established in 1973 while the Agricultural Credit Guarantee Scheme and the Rural Banking Scheme were launched in 1977. The policies and schemes were aimed at greater flow of credit into the agricultural sector. Conversely, the import liberalization policy adopted during this period had a deleterious effect on agriculture. It led to the import and sale of all sorts of agricultural items at prices lower than the unit costs of locally produced agricultural items. There were also the wage policies which were outcomes of committees' recommendations: Adebo Interim Wage and Salary awards of 1970, Udoji Wage and Salary Awards of 1974 and Shagari Awards, 1979.

As mentioned earlier, many of these policies were based on reports of committees whose recommendations were not derived from rigorous time tested policy making processes and procedures. I have every reason to doubt if information provided through memoranda and other sources were actually subjected to rigorous statistical/ econometric modeling to be able to predict the impacts of the proposed policy, and the sectors that would receive such impacts or effects. Indeed, these wage awards reduced agricultural development in Nigeria (Okunmadewa, 1993). These Awards widened rural-urban wage differentials and accelerated rural-urban migration. The resultant effect was acute shortage of agricultural labour and decline in agricultural production.

Structural Adjustment Programme Policy Era (1986- 2003)

The adoption of the World Bank/IMF inspired Structural Adjustment Programme is said to have been informed by structural distortions in the Nigerian economy. The process leading to the adoption of the SAP provides clear evidence of pretenses and hypocrisy of Nigerian policy makers. Pretending to be a democrat in military uniform, the Babangida administration called for and actually caused country-wide consultation on whether to take the IMF loan facility whose conditionalities included adoption of the SAP policies.

There was overwhelming rejection and opposition to acceptance of the loan facility. Alternatives to SAP were offered and the kiss of IMF was described as the "kiss of death". The opposition and rejection notwithstanding, the government of the day went ahead to obtain the loan with its conditionalities. It further went ahead to implement the SAP policies! These were policies not cultivated from within, but imposed on the country by external forces. The Structural Adjustment Programme as related to agriculture was designed to reverse the agricultural development philosophy of the earlier era. The SAP philosophy was that agriculture was essentially a private sector business. Government was to play the role of facilitator and supporter, the market forces were to be allowed to play a dominant role in directing the economy. The basic objectives of SAP were to:

(i) Farmers are not cultivating cocoyam anymore because of the heavy losses incurred as the crop are destroyed before they mature;
(ii) The cocoyam blight is changing the cropping culture in communities of Akwa Ibom State as farmers are restricted to a few other crops such as cassava, water yam, maize and vegetables;
(iii) It is changing the food culture of farmers and;
(iv) It is also adversely affecting farmers' income and ability to cater for household needs.

The concerns and hope expressed by farmers during the survey concerning the cocoyam were very touching. Mrs. Ene Archibong, a female farmer from Ikot Udo, Ayadehe said: "*Today, I ate cocoyam after some years of not tasting it. I harvested a few surviving corms from my wetlands plot yesterday. It was very few. Today, I decided to cook it and ate. I shared it with 2 of my grand children just to enjoy the fruit of my labour. We are really missing cocoyam".* More touching was the concern from Leader Iwat Ben Mkpa from Ayadehe who said in Ibibio: *Ku yak mkpa mkpong ikpong ami-o!* (*Don't let me die waiting for this cocoyam-o!*).

Public agricultural institutions such as Agricultural Development Projects (ADPs) and Ministry of Agriculture and Natural Resources (MANR) are waiting on research institutions to come up with the solution for extension to the farmers. The former Director, Technical Services of AKADEP, Mr. Ndehedehe expressed their expectation when I discussed the project with him thus: "*with the unction that has come upon you to come up with this idea, I am excited and hope that your efforts will come up with solution to this problem"!*

I cannot present all of them here. Suffice it to say that I have always been driven by the instinct to solve a practical problem with my research. One of such problem- solving researches I have undertaken is that on cocoyam

Mr. Chairman, when I heard the story of Mrs. X, I did not express my sympathy (as is often the tradition) and leave the matter at that. I took an action aimed at solving the problem which took the life of Mrs. X.

In 2013, I set up a team of agricultural scientists under the project name (CoRePP) Cocoyam Resuscitation and Promotion Project. We set for ourselves the task of (i) unravelling the particular cocoyam problem which led to the demise of Mrs. X, (ii) finding solutions to the problem and (iii) promoting the consumption of cocoyam.

We began our work with a thorough search of the literature which led us to confirm that: (i) the disease was taro (cocoyam) leaf blight caused by a fungus called *phytophthora colocasiae* (Raciborski), (ii) It is a global problem of the cocoyam species called colocasiae (*Colocasia esculenta*) (called, *ikpong nwa ekpo, nkene bok eyen, osobo* in Ibibio communities). The disease affects colocasia in other parts of Nigeria where it is cultivated, including Abia, Bayelsa, Cross River, Delta, Ebonyi and Enugu States. It is also found in Cameroun, Fiji Island, among others.

We followed up the literature search with a survey of the incidence of the disease in communities in four Local Government Areas of Akwa Ibom State. We found that:

(I) The disease is new and strange to farmers. It was noticed in early 2000s and they are yet to find suitable name or treatment for the disease. They have sprayed with insecticides and wood ash but these have not been effective in controlling the disease.

- restructure the economy by diversifying the productive base
- rationalize consumption patterns and reduce the economy`s dependence on petroleum exports and commodity imports
- expand non-oil exports
- reduce the import content of locally produced goods
- attain self-sufficiency in food and raw materials production within the shortest time possible
- rationalize the country`s fiscal and monetary policies, and
- liberalize the country`s trade and payment system.

To achieve the SAP objectives both fiscal, monetary, trade and exchange rate policy instruments as well as institutional policy instruments were used. Specifically, these categories of policy instruments employed include:

Fiscal Policy Instrument

- a five-year tax-free period for profits of companies engaged in agricultural production and processing;
- increase in capital expenditure by the government in spite of generally tight fiscal policy

Monetary Instrument

- interest rate deregulation
- liberalization of agricultural loan terms so that small scale farmers can obtain loans of up to N5,000 without collaterals.
- increase period for the repayment of commercial bank loans and advances.

increase from 40% to 45% in the minimum share of total deposits generated by rural banks was to be given as loans and advances in the rural localities.

Trade and Exchange Rate Policy instrument

• Naira devaluation through the foreign exchange market.

Some commentators were of the opinion that the success of SAP depended largely on agriculture as most of the objectives were closely related to agriculture. However, events in the immediate post SAP years were enough to inform government of the inherent problems with SAP. The boom that seemed to have greeted Nigerian farmers at the advent of SAP had disappeared. The situation, described as "fallacy of composition", was partly as a result of farmers buying farm inputs at pre-SAP costs (which was low) and selling their produce at SAP prices (which was high). Government saw reasons to modify SAP in 1992 in what was described as "guided deregulation" by introducing two exchange rates and dropping some other components of the programme. The voice of people, they say, is the voice of God. Probably, if government had taken into account stakeholders` views, it may have made a success of SAP.

The Reform Era (2004 - date)

Between 1999 and 2000, the civilian government under the leadership of President Obasanjo had the following agricultural policies:

- restoration of fertilizer subsidies of 25%;
- establishment of Department of Fertilizer;
- food Security and Poverty Alleviation Programme.

Our findings revealed that wetlands households were particularly vulnerability to flooding, windstorm and erosion. Households were predisposed to climate hazards including low agricultural output and income and non-availability of irrigation and storage facilities (Umoh *et al,* 2014). We also found low capabilities of climate institutions in the region. We established the fact that wetlands farmers do not have access to relevant weather information. The only sources of weather information are media houses, principally television and radio. However, farmers were quick to point out that the weather information broadcast on television and radio stations are not addressed to their needs (Umoh, *et al,* 2012).

Under the current situation, farmers would hardly protect themselves against the vagaries of weather and disease outbreaks. Little wonder then that the farmers are always, and in most cases, the first victims in the event of occurrence of any hazard. As a way of reducing farmers' vulnerability to the impacts of climate change, we recommended that in addition to other outlets, indigenous institutions including churches and other faith-based organizations should be involved in disseminating climate change information. In order to get to the nooks and crannies of farming communities, community-based weather information gathering/dissemination centres (such as schools, etc) should be created.

5.6: The Peculiarity of Cocoyam!

One of the twin opening stories of this Lecture was about cocoyam. This cocoyam has refused to go away from me. Mr. Chairman, ladies and gentleman, I have had what many may term a diverse research interest. My work spans sub specializations in agricultural and development economics and is spread through more than 80 publications in international and national journals, books, etc.

Studies have shown that the impacts of climate change differ from one ecosystem to another (Intergovernmental Panel on Climate Change, 2001, Auffret, 2003, Heger Juka and Paddison, 2008). Climate change shows up in sea level rise, emergence of diseases, among others. Wetland/coastal environments are particularly vulnerable to the impacts of climate change. For instance, calculations show that a 0.2m rise in sea level will inundate 3,400km^2 of Nigeria's coastland; a 1.00m rise will cover 18,400km^2. The whole of the Niger Delta is under 6,000 km^2 (Onofeghara, 1990); it is predicted that at least 80% of the inhabitants of the Niger Delta could be displaced due to the low level of the region (NEST, 2004).

My climate change studies have concentrated on the Niger Delta Region beginning with the comprehensive study on Farm Household Adaptation to Climate Change in the Niger Delta Region of Nigeria (Umoh *et al,* 2011). The output of this study is a book published by Xlibris Publishing, UK, entitled: *Adaptation to Climate Change: Agricultural Ecosystems and Gender Dimensions.* Generally, my studies can be grouped into three climate science domains: Climate Vulnerability (Umoh, 2002; 2005b; Umoh and Etekekpe, 2010; Umoh *et al,* 2014), Climate Change Adaptation (Umoh *et al*, 2011; 2013) and Climate Institutions Capabilities (Umoh, *et al*, 2012).

Vulnerability is the degree to which a system is susceptible to, or unable to cope with adverse effects of climate change.

The formulation of these policies and programmes followed the traditional "top down" approach of the military era. The policy makers, as ever, were optimistic that the policy would work. We are still waiting to see their outcome.

Nonetheless, an encouraging chapter in Nigeria`s annals in policy making was opened in 2004. This came with the introduction of the economic reforms christened National Economic Empowerment and Development Strategy (NEEDS). On March 15, 2004, a nation-wide consultation on NEEDS was launched by the President. This was followed by consultation workshops in the 6 geopolitical zones in the country. This was intended to give Nigerian stakeholders the opportunity to contribute their ideas to the development and finalization of the NEEDS draft document. Participants at the workshop included State Governors, Commissioners, Members of State Houses of Assembly, Secretaries to State Governments, other top members of Government and Civil Society.

NEEDS rested on four strategies, namely:

i) reforming the way government works and its institutions;
ii) growing the private sector (including the financial sector); the first of these was bank recapitalization
iii) implementing a social charter for the people; and
iv) re-orientating the people with enduring African value system.

Concerning agriculture, government intended within the NEEDS strategy, to pursue privatization and liberalization with renewed vigour. Infrastructural development was to be embarked upon with the hope that this would support the agricultural sector. Improved productivity of farmers was also a key element and priority of the agricultural sector reforms. Investment in water resources was also a priority aimed at providing irrigation for increased agricultural productivity.

Mr. Chairman, while the approach of consulting with stakeholders adopted for the reform programme was a welcome departure from the past, enthusiastic wholesale economy-wide implementation of the reforms policies without trial clearly showed that we had learnt nothing from the past. The usual optimism that the policy would work was here being assumed.

Agricultural Transformation Agenda

Under the Yara'dua – Jonathan administration, Agricultural Transformation Agenda (ATA) was introduced. ATA focused was on fertilizer and seed policy reform under Growth Enhancement Support Scheme(GESS). GESS target was to migrate from subsistence farmers to commercialize system within a period of 10 years. Under the GESS framework, government was to:

- provide 50% support for seeds and fertilizer to farmers
- provide the support directly to farmers, not via general price subsidy on fertilizer or seeds.
- private sector to sell inputs directly to farmers and build supply chains to get to rural areas.

The application of the model to data from other locations (Umoh and Yusuf, 1999; Umoh, 2013c; Umoh, Ibok and Umoh, 2009; and Akpaeti, Umoh and Etim, 2014; Akpaeti and Umoh 2015) confirmed that our farmers were not operating at the optimum level of production.

5.5: The Challenge of Climate and Environmental Change

In the late 19th century, scientists first argued that human emissions of greenhouse gases could change the climate (en.m.wikipedia.org). However, as of today, the issue of climate change and its impacts are no more subject of debate but reality. McGray (2012) likens the impacts of climate change to a chronic disease. He said: "When one has a simple headache, he/she can take panadol, aspirin, and it usually clears up.

But if one has a heart disease, he/she will likely need to make some major changes in his/her lifestyle: diet, exercise, plenty of doctor's visits and perhaps a long-term course of expensive prescription. Climate change, unfortunately, is not headache. Climate change is an ailment and the developing countries are most vulnerable".

Nigeria agriculture is particularly vulnerable to Climate change since agriculture in the country relies on rainfall and, according to IFAD (2009), over 70% of the country's population depends directly or indirectly on rain-fed agriculture. Wetlands farming is particularly vulnerable due to the peculiar environment that it is practised.

Risk-averse Farmers' recommended crop combinations: Rice; fluted pumpkin (as sole crop); fluted pumpkin, pepper and okra; or cassava, fluted pumpkin and okra; cassava, cocoyam and fluted pumpkin; or cassava, cocoyam, maize and fluted pumpkin.
Risk-loving (Profit maximizing) farmers' recommended crop combinations: Rice, or cassava, cocoyam, maize and fluted pumpkin.

Mangrove Swamp:
Risk-neutral farmers' recommended crop combinations: Rice; fluted pumpkin (as sole crop); or fluted pumpkin, pepper and okra; or cassava, fluted pumpkin and okra; or cassava, cocoyam and fluted pumpkin; or cassava, cocoyam, maize and fluted pumpkin.
Risk-averse farmers' recommended crop combinations: Rice; or fluted pumpkin (as sole crop); or fluted pumpkin, pepper and okra; or cassava, fluted pumpkin and okra; cassava, cocoyam and fluted pumpkin; or cassava, cocoyam, maize and fluted pumpkin.
Risk-loving (Profit maximizing) farmers' crop combinations: Cassava, fluted pumpkin and okra.

In each of the scenarios, it was found that wetlands farmers were not at optimal level in their current operation (Umoh, 2000a, 2008c). The use of stochastic frontier model of analysis further revealed that wetlands farmers were not operating at the best level of production as the best producer recorded a maximum efficiency of 91%, mean efficiency was 72% and minimum efficiency was 43% (Umoh, 2006).

- government was to provide risk sharing guarantee to leverage loans from banks for seed and fertilizer companies and agro-dealers.
- government was to buy-back 30% of any stock at end of season to reduce risks for the supply companies.
- government was to pay 10% of sales to farmers.

With the change in government in 2015, the strategy also had to change. The new strategy, contained in: The Agriculture Promotion Policy (2016 – 2020) proposes to build on the success of the ATA, and closing key gaps.

In a "Foreword" to the Policy and Strategy document, the Hon. Minister, Federal Ministry of Agriculture and Rural Development, Mr. Audu Ogbeh was to admit "years of benign neglect" of agriculture and pledged to refocus the sector by implementing a new strategy that will "stem food import" and enable Nigeria "earn significant foreign exchange" from agriculture.

My conclusions from this review are that:

- Pre-independence agricultural policy was largely influenced by foreign consultants.
- Immediate post-independence policy making was spearheaded by foreign consultants with little collaboration and input from Nigerian experts. The inputs/opinions of the ultimate beneficiaries and other stakeholders did not count in Nigeria's agricultural policy making;

- Nigeria's agricultural policy makers are, in large part, not guided by the needs of Nigerians but by the demands of foreign markets or the direction dictated by developed countries;
- The consequence of foreign-driven agricultural policies are frequent policy changes and failures in most cases.

These findings elicited the question: *Agricultural Policy making: A serious Business or a business done unseriously?* that I posed at the first Department of Agricultural Economics & Extension Public Lecture in 2005 (see Umoh, 2005). Uche (2011) writing on a similar note, asserts that Nigeria's agricultural policies have been inefficient and ineffective as the intended results were not realized. He attributes these to the fact that the formulation of agricultural policies often does not take a critical analysis of the social, economic, physical/ environmental and political impact of such polices on the intended beneficiaries.

Mr. Chairman, my response to the question which I asked 11 years ago and now is that politicians, (soldiers and civilians), policy makers, planners, researchers, extension workers, agro-industrialists, agricultural produce exporters as well as local and foreign consultants and agricultural financiers such as Commercial Banks, Development banks, the World Bank and others have all not been serious with agriculture in this country since the 1970s.

I asserted in that study that (i) wetlands farming is management of risks (ii) farmers operate between two extreme risk conditions-floods and drought, and (iii) These two extreme weather conditions can cause drastic reduction in agricultural outputs. In this study, I was able to determine the optimal farm plan for inland valleys, flood plains and mangrove swamp farms. I established 3 scenarios which the farmer can select from depending on his/her attitude towards risk. A farmer could either be risk loving, risk averse or risk neutral in his/her attitude. The recommended crop /enterprise combination are:

Inland Valleys:
Risk-neutral farmers can cultivate either of these crop combinations: fluted pumpkin (as sole crop); fluted pumpkin, pepper and okra; or cassava, fluted pumpkin and okra; cassava, cocoyam and fluted pumpkin; or cassava, cocoyam, maize and fluted pumpkin.
Risk-averse farmers can also cultivate all of the above crop combinations.
Risk loving (Profit maximizing) farmers can cultivate cassava, cocoyam, maize and fluted pumpkin as a combination.

Floodplains:
Risk-neutral farmers' recommended crop combinations: Rice; fluted pumpkin (as sole crop); fluted pumpkin, pepper and okra; or cassava, fluted pumpkin and okra; cassava, cocoyam and fluted pumpkin; or cassava, cocoyam, maize and fluted pumpkin.

5.4: Farm Resources Management

The basic thrust of the economics of agricultural production at the micro-level is to assist individual farmers or groups of farmers to attain their objectives through intra-farm allocation of resources over a period of time. Economics of agricultural production is achieved either by maximizing output from resources or minimizing the cost of the resources required for producing a given output. However, this depends on how the farmer manages the farm resources at his/her disposal.

Farmers in Nigeria practise rain-fed agriculture. Therefore, the extent of success recorded by farmers in managing farm resources is determined, to a large extent, by the weather conditions. And, Nigeria has established the Nigerian Agricultural Insurance Company (NAIC) to provide protection to farmers from effects of natural risks like floods, droughts, diseases, fire, etc, which are a recurring decimal in Nigeria agriculture sector. However, while it is reported that a special insurance package has been prepared for the beneficiaries of programmes such as the National Poverty Eradication Programme (NAPEP), there is none for wetlands/Fadama farmers whose livelihood activities are exposed to even more risky conditions!

Ladies and gentlemen, it is in the area of managing farm resources in wetlands farming that I have carried out some pioneering studies. It started with my seminal work on the economics of wetlands farming in Akwa Ibom State (Umoh, 2000a) earlier referred to.

This has resulted in what I call the "tragedy of copying". The tragedy manifested in the shock which Mrs. X experienced and could not recover from, because unlike others, she was serious with her farming business, ironically, unlike the stakeholders just mentioned.

Policy Implementation

Studies have shown that policy implementation is a major problem in Nigeria (Garba, 2012). Policy implementation affects outputs and outcomes. In wetlands agriculture, the effects of policy implementation manifest in different forms, some of which are discussed below:

5.3: Farm Inputs Quantity, Quality and Time of Supply

Agricultural policies formulated and implemented by a country have direct bearing on farm input supply and utilization. No agricultural production can take place without farm resources or inputs. These inputs are in the form of land, seeds/seedlings, agrochemicals, water/irrigation and labour. The problem of input supply to agriculture comes in 3 dimensions: insufficient quantity, poor quality and wrong timing of supply (Ndaeyo, Umoh and Ekpe, 2001).

In the case of wetlands farming, there is always a mismatch in time horizon between farm inputs, demand and supply. Generally, since farming in Nigeria is rain-fed, most government agricultural inputs support programmes are targeted at the planting season of the upland farmers (between the months of March and May). This period corresponds to the end of the dry season and the beginning of the rains.

However, crop planting in wetlands locations in Southern and Eastern Nigeria, for instance, commences about the month of November. Thus, in almost all cases, wetlands farmers miss benefitting from input supply programmes and are left to rely on own seeds with attendant low viability and yield (Umoh, 2015).

Infrastructural Inputs: The provision of infrastructures for production constitutes the primary role of government in agriculture (Ukoha, 2013). Besides road and storage infrastructure, one other important need for wetlands farming is irrigation infrastructure. Irrigation infrastructure is crucial for achieving enhanced agricultural outputs. It has been described as the condition necessary for agricultural growth in situations of insufficient rainfall and or poor distribution of rainfall in agriculture producing areas (Punial and Pande, 1979 cited in Oriola, 2009). However, in Africa, except for Madagascar, South Africa and a few countries in northern Africa, the potential for irrigation has not been effectively tapped (CTA, 2003). In Nigeria, despite the considerable potential for development and emphasis placed on irrigation development in many plans, only 4% of the cultivated area in the country is irrigated (Takeshima, Adeoti and Salau, 2010).

We have observed that in the absence of irrigation facilities, wetlands farmers are still passing through the drudgery of using calabashes, basins, and earthen wares for hand-watering of crops in the field.

In the year 2000, we assessed the capabilities of agricultural institutions in Akwa Ibom State. The study specifically looked at 4 Departments in the Akwa Ibom State Ministry of Agriculture and Natural Resources-Finance/Supplies, Loans Board, Veterinary Services, Fisheries and Extension Services. The study revealed a wide gap between personnel requirement and availability. Of particular interest to us were staffing/staff strength, staff training/development, funding and types of linkages these departments have with other organizations. Linkages was low and with only a very few agencies (World Bank, UNDP/IFAD, Federal Ministries) and there was no regular training (Umoh, 2000c). A more disturbing scenario was found in terms of financial disbursements to these departments as some units did not receive funding throughout a year from the budget they presented.

Mr. Chairman, records show that there are several agricultural institutions in Nigeria to respond to the farmers' problems. These include the ministries of agriculture (at the Federal and State levels), departments and agencies including research institutions. As at the last count, there were up to 18 National Agricultural Research Institutes (NARIs) under the Federal Ministry of Agriculture and Rural Development. The performance of these MDAs over the years has been a subject of concern. Findings show that either they are not properly funded or they do not have the required manpower or their personnel do not have the right skills/aptitude to solve the problems of the agriculture sector. As I deliver this lecture today, the cocoyam disease which had been reported in the country several years back and which took the life of Mrs. X still remains! This remains the case in the presence of several agricultural research institutions in the country.

They prefer jobs in the banks/financial institutions, government ministries and parastatals and even oil companies. No wonder Nigeria is still a net importer of food items, including rice, which she can produce in abundance! Graduates of agriculture who should apply the technical knowledge gained from the universities and other tertiary institutions in the production, processing and distribution of agricultural products to boost the economy, may be underemployed or wasting away in areas they are less skilled to make meaning impact. Umoh (2012) also found a negative correlation between the level of education and the willingness of personnel to work in the Ministry of Agriculture and Natural Resources. This implies that if staff acquire higher qualifications, they would prefer to move out of the Ministry.

Mr. Chairman, the scenarios just described above call for serious reflection on the nature of training the students of agriculture receive. The issue of static curricula in our tertiary institutions has received comments in national discourses (Kukah, 2014, Inoyo, 2014). Herein may lie the problem and the solution to dismal performance of Nigeria agriculture.

Institutional Capabilities: The role of institutions in promoting growth in developing economies is well recognised (see World Bank, 1993; Easterly and Levine, 1997; Stiglitz, 1998; and Aron, 2000). Institutions are conceptualized in this lecture as those organizations and agencies (including their rules/policies and structures) set up by government to give effect to its policy and programme pronouncements. These include Ministries, Departments and Agencies (MDAs) of government. The dismal failure of agricultural policies and programmes to deliver expected outcomes is a source of concern about the capabilities of agricultural institutions in the country.

Our study of climate change adaptation by farmers in the Niger Delta region (Umoh, *et al* 2011) confirmed, first hand, the stark reality of wetlands farmers' need for irrigation facilities.

This situation should not be as there exist simple small irrigation facilities which the small scale wetlands farmers can use to boost farm production. I had the opportunity of demonstrating the impacts of irrigation on wetlands farming in the course of my development practice. This happened in 2007 when the European Union Micro-projects Programmes in Six States of the Niger Delta (EU MPP6) which I served as Expert/Consultant and Zonal Coordinator, decided to support small irrigation in the six states of our operation.

The Project consisted of water pumps (to pump water from perennial water source), over- head tanks (placed on tank stands), water hoses and pipes to reticulate water in the field. Crop production inputs including seeds, fertilizer, as well as equipment were provided. The farmers were trained on the various components of crop value chain, record keeping and group dynamics. The project was established in ULLONA Farm Settlement (Abia State), Ata Obio Akpa (Akwa Ibom State), Akai Effiwat (Cross River State), Ilushin (Edo State), Lowa Okata (Imo State) and Ayede Ogbese (Ondo State) (Umoh, 2008b). Some of the projects (ULLONA Farm Settlement, Ata Obio Akpa and Ayede Ogbese) proved quite successful to the extent that the Ayede Ogbese Project became a site for university students' excursions.

Outputs from these projects doubled and farmers made almost 90% margins on their sales. The intervention had combined positive effect on income, livelihoods and even aspirations of the farmers (Umoh, 2008b). The experience from this project was the subject of my presentation in 2015 at the World Water Congress XV organized by the

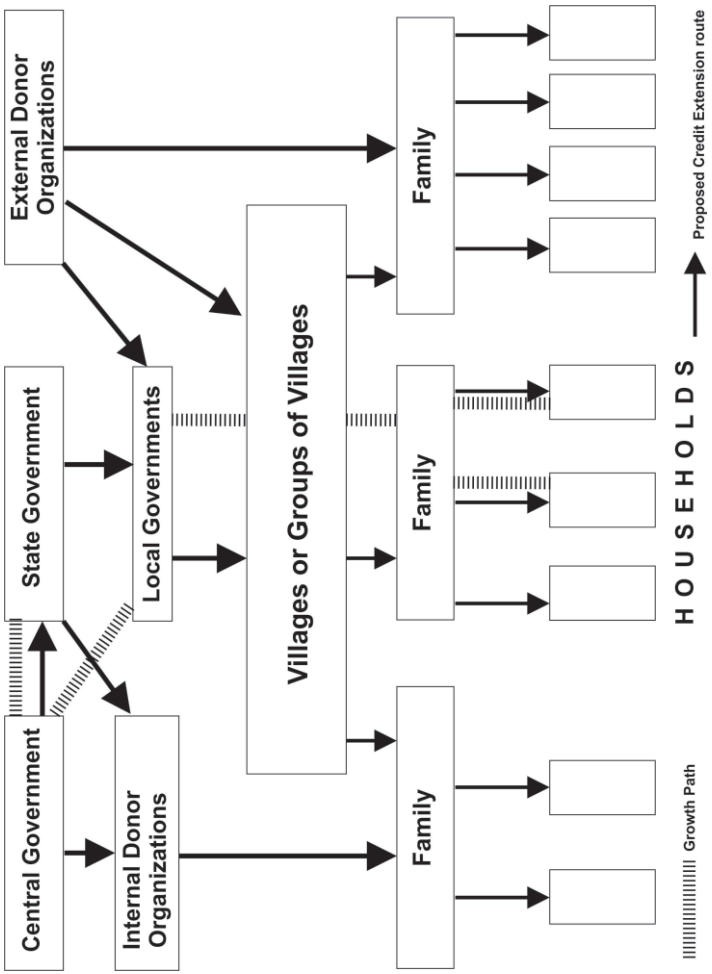
International Water Resources Association (IWRA) in Edinburgh, Scotland, entitled: "Taking Water to Wetlands: An Experiment with Small Irrigation for Resource Poor Farmers" (www. iwra.org).

Mr. Chairman, I had shown previously how the Nigerian Government has moved away from keeping National Fadama Development Project as an irrigation infrastructure project to a poverty alleviation scheme. The adverse impacts of this change in focus could have on the resource poor wetlands farmers may be unimaginable. It is, therefore instructive that the National Fadama Development Project be returned to its original mandate of providing irrigation and other facilities to wetlands farmers only.

Agricultural Human Resources: Another important factor of production is the human resources and the institutions which they man. These are the most crucial factors in the economic growth of a country (Dwivedi, 1980). The quantity and quality of the human resources matter. Modern day societies and organizations depend heavily on the abilities of many highly trained people for their success. Sadly, studies have shown that a large percentage of farmers, wetlands farmers inclusive, in Nigeria are non-literate or have very low level of education (Ndaeyo, *et al* 2001), and graduates of agriculture do not seem to be taking to agriculture after acquiring high level of education.

In a study conducted to ascertain how agriculture has benefitted from human capital development reforms in Nigeria, Umoh (2007), found that though there has been a rise in agricultural human capital (measured by the number of agriculture graduates from Nigerian tertiary institutions-Faculties of Agriculture in Universities, Polytechnics and Monotechnics), this did not reflect on agricultural growth. Both regression and correlation analyses results showed on inverse relationship between agricultural growth and human capital. This means that the farming population is depleted as more people obtained higher agriculture education. Is it surprising then that studies reported that it is the non-literate and poor segment of the Nigerian population that actually produce the locally produced food we eat in the country?

Indeed, experience from across various Faculties of Agriculture in Nigerian universities shows that not more than one out of two hundred graduates of agriculture disciplines would want to take to farming.



The *Ekpuk* Model of Micro-Credit Delivery

Fig 1. Small irrigation of Ata Obio Akpa, Akwa Ibom State
(Photo Credit, Umoh. G.S. 2008)

Financial Inputs: The government of Nigeria has put in place several agricultural financing policies and institutions. First there was the Credit Corporation of the regional government. An example of this is the Agricultural Credit Corporation of Western Nigeria which extended credit to cocoa, rice, maize and other crops producers and marketers. This was followed by the establishment of the Nigerian Agricultural and Cooperative Bank (NACB) Ltd (now, Bank of Agriculture) in 1973 with the mandate of on-lending to both the small and large scale farmers. Other programmes and schemes include The Rural Banking Scheme of 1977, Agricultural Credit Guarantee Scheme (ACGS) of 1977, The Peoples Bank of Nigeria of 1989, The Community Bank (CB) of 1990; The Family Economic Advancement Programme (FEAP) of 1997 and Micro-Finance Bank of 2000. Each of the wetlands development projects earlier discussed had credit components embedded in it.

Contrary to expected outcomes, the effects of agricultural financing on agricultural sector have been seen to negligible and in general, adverse (Inang and Ukpong, 1992; Soyibo, 1996). In many of the studies conducted on this subject, farmers complained of their inability to meet collateral security requirements, high interest rates, cumbersome loan processes (Umoh and Azeez, 2000; Umoh 2000b; 2006). For these reasons, farmers prefer informal sources of funding such as *Etibe* (Rotating and Savings Associations), Daily Collectors (Mobile Bankers), etc (Umoh, 1998).

We have also found that without government support, some of the funding institutions such as BOA would not be able to sustain themselves.

Mr. Chairman, no meaningful agricultural production can take place without some form of financing. In order to promote agricultural businesses, Umoh and Ibanga (1997), have proposed a sustainable alternative microcredit model for Nigeria. The model is called ***Ekpuk*** Micro-credit Delivery Model.

This model recognises the family as an economic unit where production and consumption occur. Each family should be identified as an enterprise cluster or sub-cluster. Donor/government/financial institution funds could be channeled through the families for investment. The clusters/sub-clusters so identified and funded should be trained along the line of their expertise and skills. Besides funding and capacity building, they should be linked up to markets and continuously mentored to maturity. The time-tested family values of honesty, prudence, hard work and enterprise should be exploited. This financing mechanism could awaken the dormant entrepreneurship spirit in family units leading to explosion of enterprises, family businesses and entrepreneur populations in rural areas and wetlands communities.