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SOIL SCIENCE SOCIETY OF NIGERIA

1969 - 2019

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Celebrating 50years of SSSN

1969 - 2019

Published by :
The Soil Science Society of Nigeria,
with support from Nigeria Institute of Soil Science

SOIL SCIENCE SOCIETY OF NIGERIA

YEARS OF SSSN

1969-2019

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with support from Nigeria Institute of Soil Science

SOIL SCIENCE
SOCIETY OF NIGERIA

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with support from Nigeria Institute of Soil Science

Foreword

The Soil Science Society of Nigeria (SSSN) was formed as an Association of soil scientists in 1969. The main aim of the Society is to promote the knowledge and practice of soil science. Since its inception, the Society has impacted positively, the nation's economy through the application of scientific methods in the use of Nigeria's land resources, particularly in soil conservation and fertility management. . Looking back to memory lane, the Society has witnessed multifarious stages of growth and gone through different levels of transformation to raise its standard. Now at 50 years, the Society has recorded tremendous landmark achievements with greater expectations for better future. There is no gain saying that over five decades the Society has contributed immensely to the development of soil science, in manpower development and in agricultural development programmes in Nigeria.

This book is a proper documentation of the activities of the Society and the journey made so far in the implementation of its national and international programmes. The book also documents chronologically, activities and efforts of our distinctive past leaders. The major gaps, challenges faced, achievements realized and milestones achieved by the Society in the last half a century are accordingly highlighted. The seven chapters gathered herein further focus on development of soil science education in Nigeria, researches undertaken in the past five decades as presented in the Society journals and other publications, strategic partnership between the society and both national and international stakeholders. The range of communiqué with their impact on government policy, and the highlights of the contributions of some senior soil scientists to the community as a reflection of giving back to the community are also included.

For five decades, the Society has embarked upon programmes that enabled it to meet up to expectations of members the nation at large. I can conveniently state that the Society has lived up to expectation as a union of professionally like minds who have forged ahead to contribute their quota in developing the nation's economy through soil science.

I therefore have the pleasure to appreciate all stakeholders including the Federal Government of Nigeria, soil scientists and other relevant professionals who have made the Society what it is today. This historical document as a repository of knowledge and historical epoch is hereby dedicated to all soil scientists wih the professional zeal to ensure proper and sustainable use of soil resources. It is my belief that the Society will break new grounds and achieve greater feats in more years to come.

Finally, I as a living witness of the life, growth and development of this great Society which has most recently established a foremost Institute – Nigeria Institute of Soil Science introduce this historical book to all as a digest. Therefore, it is a great honour and privilege for me to be opportuned to serve the Society in various capacities and to write this piece at this time of its golden jubilee.

Prof. W. O. Enwezor
2nd President, SSSN.

Preface

This book is written to comprehensively document the history and contributions of the Soil Science Society of Nigeria (SSSN) since it inception in 1969. The Society came into existence in 1969 by the efforts of a group of Soil Scientists who shared a common aspiration of promoting the knowledge and practice of soil science. Since I became part of the executive council of the society in 1998, first as an Assistant Secretary, Treasurer in 2003, Vice President in 2016 and now the 8th President in 2018, I have releazed that though the Society was founded in 1968 during the Nigeria Civil war, a trying period in the history of Nigeria, the Society has survived against all odds. It has impacted positively in the application of scientific methods in the use of Nigeria's land resources, primarily in soil conservation and fertility management to support the nation's economy. However, aside from the very few senior soil scientists that are left, the sacrifice, contributions and challenges surmounted to bestow a virile society are yet to be fully appreciated.

Proper documentation, record keeping and easy retrieval of existing SSSN documents seem to be a problem. Records are moved from one Secretary to another while a permanent secretariat did not materialise until recently. To attain the objective of the book, thematic groups were created with members assigned to handle each groups. The groups relied on archival materials from both published and unpublished sources while very senior scientists like Profs Enwezor, Agboola, Obigbesan were also interviewed for oral tradition of the society. However, responses from members were very poor at the beginning but using the SSSN WhatsApp platform the needed information finally poured in. The journey of SSSN has not been all rosy but the sacrifices of the over 200 financially active members and the over 1000 inactive members coupled with the international support have made the history of SSSN worthy of telling. This book to commemorate the FIVE DECADES of SSSN highlights the journey so far and the activities and endeavours of our past leaders. The book also highlights gaps where they exist and proffer solution for the future of the science of soils.

The book contains seven chapters; chapter one focused on the formation, members trajectory and achievements while chapter two tracts the development of soil science education within Nigeria. Chapter three evaluates the nature of researches undertaken in the last fifty years and centres where such researches take place. Chapter four focuses on the cultivation of strategic partnership between the society and both national and international stakeholders while chapter five captures the range of communique and their impact on both government policy and their level of implementation. Chapter six summarized the evolution, relevance, achievements and challenges the society has faced in the last half century and charting the way forward. Finally, chapter seven highlights the contributions of some senior soil scientists to various communities as a reflection of giving back to the people.

Finally, this book is a must read for every student of soil science and agriculture in Nigeria and all those who are interested in the future of soils. I also recommend it to all stakeholders in the agricultural sector of our economy and international partners. I hope the book will serve as inspiration to upcoming soil scientists to rise to future challenges.

Prof Bashiru Ademola Raji, *FSSSN, FCAI, FASI*
8th President, SSSN July 2019.

CONTENTS

CHAPTER 1

SOIL SCIENCE SOCIETY OF NIGERIA IN FIFTY YEARS: FORMATION, PAST AND PRESENT LEADERSHIP

BY

[1]Asawalam D. O. , [2]Chude V. O., [3]Ewenzor W. O., [4]Agbede O. O., [5]Ezendu C. O.

[1]Department of Soil Science, Micheal Opara University of Agriculture, Umudi

[2]Nigeria Institute Of Soil Science, Abuja, Nigeria.

[3] Department of Soil Science, University of Nigeria, Nsukka.

[4]Department Of Soil Science, Landmark University, Omu-Aran, Kwara State

[5]Nigeria Institute of Soil Science, Abuja, Nigeria

FORMATION

Soil Science Society of Nigeria (SSSN) came into existence in 1969 by the efforts of a group of soil scientists who shared a common aspiration of promoting the knowledge and practice of soil science. Their objectives were:

a. To foster the pursuit and understanding of soil science in Nigeria,
b. To disseminate knowledge of soil science through publications, demonstrations, symposia, seminars, lectures, etc.,
c. To promote the interest of soil scientists and farmers,
d. To be in close collaboration with societies having related objects both in Nigeria and other parts of the world,
e. To promote proper soil management for sustainable agricultural production and environmental wholesomeness.

Through the commitment of the founding members, coordinated by Dr. Jaiyebo, the society reached out to soil scientists in Universities, Research Institutes, Ministry of Agriculture, Colleges of Agriculture and other Institutions and Agencies. Nigeria was in civil war when the society was formed, hence, membership of the society was limited to scientists from the West and the north between 1969 and 1971. At a conference of the society in 1971 at the University of Ife (now Obafemi Awolowo University, Ife), Professor Walter Enwezor, who visited Ife to conduct laboratory practicals for his students from University of Nigeria, Nsukka was elected as the Secretary of SSSN. Dr D.O. Ataga, then Director of NIFOR, Benin City was also elected the first President of Soil Science Society of Nigeria (SSSN). From Ife in 1971, the conference moved to Kano in 1972 and to Calabar in 1973. The conferences in 1972 and 1973 were marked with very poor attendance. Consequently, annual scientific meetings were suspended for some time. An

opportunity came a few years later to revive the society when A. O. Nnodi, a member of the society, became a Director in the Ministry of Agriculture and Natural Resources. He saw the opportunity of using the society to make impact in agricultural development and invested in it. Through his Department, he sponsored the conferences of SSSN for some years while the members of the society worked closely with his Ministry to address all agricultural challenges brought to their knowledge. Prof. Enwezor served as the secretary of the Society from 1971 to 1984. On the 9th day of December 1984, the Soil Science Society of Nigeria was duly registered with the Corporate Affairs Commission as a corporate body with the following as duly appointed trustees - D.O. ATAGA, W.O. ENWEZOR, G.O. OBIGBESAN, S.A. ADETUNJI, A.O.NNODI

No.3087

FEDERAL REPUBLIC OF NIGERIA

The Land (Perpetual Succession) Act. Cap. 98

CERTIFICATE OF INCORPORATION

of the Registered Trustees of . SOIL SCIENCE SOCIETY OF NIGERIA

I HEREBY CERTIFY THAT:

D.O. ATAGA, W.O. ENWEZOR, G.O. OBIGBESAN, S.A. ADETUNJI, A.O.ANODI.

The duly appointed Trustee of SOIL SCIENCE SOCIETY OF NIGERIA

have this day been registered as corporate body, subject to the below mentioned conditions and directions.

GIVEN under my hand at Lagos this 09TH .....day of DECEMBER 1984

Certified True Copy

SIGN: AZUKA OBIAGELI AZINGE
20 August, 2018
Companies Incorporation Officer
Corporate Affairs Commission

MAJOR GENERAL MOHAMMED MAGORO
HONOURABLE MINISTER
FEDERAL MINISTRY OF INTERNAL AFFAIRS

CONDITIONS AND DIRECTIONS

"This Certificate is liable to cancellation should the objects or the rules of the body as set out in the Annexure hereto be changed without the previous consent in writing of the Minister or should the body at any time permit or condone any divergence from or breach of such objects and rule."

From inception in 1969, Soil Science Society of Nigeria has concerned itself with the furtherance of the application of scientific methods in the use of Nigeria's land resources, primarily in soil conservation and fertility management to support the nation's economy. Specifically, she has played significant roles in issues dealing with:

a. Inorganic and organic fertilizer usage and development,
b. Soil testing,
c. Classification and mapping of soils,
d. Land clearing and development,
e. Soil conservation through erosion, desertification and pollution control,
f. Manpower development and training in soil science at the undergraduate and postgraduate levels, and capacity building for practising soil scientists.

Soil Science Society of Nigeria has worked in close collaboration with the Federal Ministry of Agriculture over the years to tackle soil – related challenges to crop production. The society over the years participated actively in the activities of International Soil Science Society (ISSS) (now, International Union of Soil Science (IUSS)). For instance, SSSN was represented by the strongest contingent from Africa at the 13th ISSS conference at Hamburg, Germany in August 1986. This feat was also repeated at the 20th World Congress of Soil Science in Jeju, South Korea in June 2014.

PAST AND PRESENT LEADERSHIP

Many distinguished soil scientists have given leadership to Soil Science Society of Nigeria from its inception to date. Officers of the Society are elected at the annual general meeting for a period of two years which is however, renewable for a final term of another two years. The case of the leadership of Prof Victor Chude who served for fourteen (14) years remains the longest serving president. Under his watch as President, the bill for the establishment of Nigerian Institute of Soil Science (NISS) was started and successfully prosecuted. In all there has been Eight (8) Presidents since 1971 to date. Quality leadership has been responsible for the steady growth of the society. The following executive officers have piloted the affairs of the society at different times.

NAME: **DR JAIYEBO**

OFFICE HELD : **COORDINATOR**

DATE : **1969-1970**

NAME	OFFICE HELD	DATE
Dr. O. O. Afaga	President	1971-1984
Prof. A. A. Agboola	Vice President	1971-1984
Prof. W. O. Enwezor	Secretary General	1971-1984
Dr. M. C. Igbokwe	Asst. Secretary General	1971-1984
Dr. G. O. Obigbesan	Treasurer	1971-1984
Dr. G. O. G. Lekwa	Financial Secretary	1971-1984
Dr. U. Omoti	Ex-Officio Members	1971-1984
Dr. E.O.U. Okoye	Ex-Officio Members	1971-1984

NAME	OFFICE HELD	DATE
Prof. W. O. Enwezor	President	1986-1988
Prof. G. A. Ojanuga	Vice President	1986-1988
Dr. U. Omoti	Secretary General	1986-1988
Dr. V O. Chude	Asst. Secretary General	1986-1988
Dr. G. O. Obigbesan	Treasurer	1986-1988
Dr. O. O. Agbede	Financial Secretary	1986-1988
Dr. E. O. U. Okoye	Ex-Officio Members	1986-1988
Dr. V. O. Banjoko	Ex-Officio Members	1986-1988

NAME	OFFICE HELD	DATE
Late Prof. A. G. Ojanuga	President	1989-1992
Dr. E.O.U. Okoye	Vice President	1989-1992
Dr. U. Omoti	Secretary General	1989-1992
Dr. V O. Chude	Asst. Secretary General	1989-1992
Dr A Olu-Obi	Treasurer	1989-1992
Prof P.O. Aina	Financial Secretary	1989-1992
Prof. W.O. Enwezor	Ex-Officio Members	1989-1992

NAME	OFFICE HELD	DATE
Late Prof. R. Sobulo	President	1993-1996
Prof. E. J. Udo	Vice President	1993-1996
Prof. S. O. Ojeniyi	Secretary General	1993-1996
Dr. A. Olu-Obi	Treasurer	1993-1996
Dr. U. Omoti	Ex-Officio Members	1993-1996
Dr. A. Fapohunda	Ex-Officio Members	1993-1996

NAME	OFFICE HELD	DATE
Prof. G. Lombin	President	(1997-1999)
Dr. U. Omoti	Vice President	(1997-1999)
Prof V.O. Chude	Secretary General	(1997-1999)
Prof S.O. Ojeniyi	Asst. Secretary General	(1997-1999)
Dr A. Olu-Obi	Treasurer	(1997-1999)

NAME	OFFICE HELD	DATE
Dr. U. Omoti	President	2000-2002
Prof. V. O. Chude	Vice President	2000-2002
Prof. S. O. Ojeniyi	Secretary General	2000-2002
Dr. B. A. Raji	Asst. Secretary General	2000-2002
Dr. A. Olu-Obi	Treasurer	2000-2002
Mr. C. O. Ezendu	Ex-Officio Members	2000-2002
Prof. A. A. Agboola	Ex-Officio Members	2000-2002
Dr. Sheriff Sanni	Ex-Officio Members	2000-2002

NAME	OFFICE HELD	DATE
Prof V.O. Chude	President	2003-2006
Prof. O. O. Agbede	Vice President	2003-2006
Dr. A. E. Isenmila	Secretary General	2003-2006
Dr. A. O. Ano	Asst. Secretary General	2003-2006
Dr. B. A. Raji	Treasurer	2003-2006
Dr. Aduramigba Modupe	Financial Secretary	2003-2006
Prof. A. A. Agboola	Ex-Officio Members	2003-2006
Dr. U. Omoti	Ex-Officio Members	2003-2006
Prof. N. O. Isirimah	Ex-Officio Members	2003-2006

NAME	OFFICE HELD	DATE
Prof V.O. Chude	President	2007-2009
Prof. O. O. Agbede	Vice President	2007-2009
Dr. A. C. Odunze	Secretary General	2007-2009
Dr. A. O. Ano	Asst. Secretary General	2007-2009
Prof. B. A. Raji	Treasurer	2007-2009
Dr. V. Modupe	Financial Secretary	2007-2009
Prof. A. A. Agboola	Ex-Officio Members	2007-2009
Dr. U. Omoti	Ex-Officio Members	2007-2009
Prof. N. O. Isirimah	Ex-Officio Members	2007-2009

NAME	OFFICE HELD	DATE
Prof V.O. Chude	President	2010-2014
Prof. O. O. Agbede	Vice President	2010-2014
Prof. J. A. Adediran	Secretary General	2010-2014
Dr. D. O. Asawalam	Asst. Secretary General	2010-2014
Prof. B. A. Raji	Treasurer	2010-2014
Dr. M. A. N. Anikwe	Financial Secretary	2010-2014
Prof. I. E. Esu	Ex-Officio Members	2010-2014
Dr. O. T. Ande	Ex-Officio Members	2010-2014
Mr. C. O. Ezendu	Ex-Officio Members	2010-2014
Prof. A. G. Ojanuga	Ex-Officio Members	2010-2014

NAME	OFFICE HELD	DATE
Prof V.O. Chude	President	2015-2017
Prof. B. A. Raji	Vice President	2015-2017
Prof. J. A. Adediran	Secretary General	2015-2017
Dr. D. O. Asawalam	Asst. Secretary General	2015-2017
Dr. O. T. Ande	Treasurer	2015-2017
Dr. M. A. N. Anikwe	Financial Secretary	2015-2017
Prof. O. O. Agbede	Ex-Officio Members	2015-2017
Prof. G. A. Oluwatosin	Ex-Officio Members	2015-2017
Mr. C. O. Ezendu	Ex-Officio Members	2015-2017

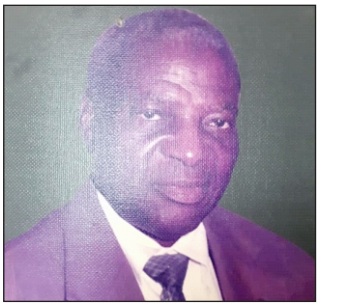
NAME	OFFICE HELD	DATE
Prof. B. A. Raji	President	2018-Date
Prof. D. O. Asawalam	Vice President	2018-Date
Prof. P. I. Ogban	Secretary General	2018-Date
Prof. H. A. Mohammed	Asst. Secretary General	2018-Date
Dr. O. T. Ande	Treasurer	2018-Date
Dr. E. E. Oku	Financial Secretary	2018-Date
Prof. G. A. Oluwatosin	Ex-Officio Members	2018-Date
Prof. O. O. Agbede	Ex-Officio Members	2018-Date
Prof. V. O. Chude	Ex-Officio Members	2018-Date

PAST AND PRESENT PREIDENTS

Dr. D. O. Ataga
(1971-1984)

Prof. W. O. Enwezor
(1986-1988)

Late Prof. A. G. Ojanuga
(1989-1992)



Late Prof. R. Sobulo
(1993-1996)

Prof. G. Lombin
(1997-1999)

Dr. U. Omoti
(2000-2002)

Prof V.O. Chude
(2003-2017)

Prof. B. A. Raji
(2018-Date)

PAST AND PRESENT SECRETARIES

Prof. W. O. Enwezor
(1971-1984)

Dr. U. Omoti
(1989-1992)

Prof. S. O. Ojeniyi
(1993-1996 & 2000-2002)

Prof V.O. Chude
(1997-1999)

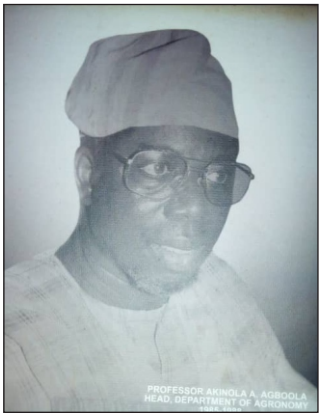
Dr. A. E. Isenmila
(2003-2006)

Dr. A. C. Odunze
(2007-2009)

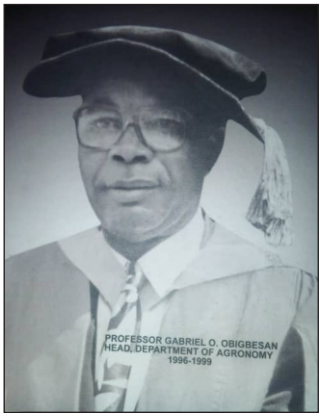
Prof. J. A. Adediran
(2010-2017)

Prof. P. I. Ogban
(2018-Date)

SOME FOREMOST SOIL SCIENTISTS

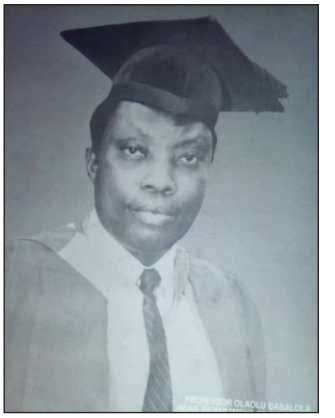


Professor Akinola A. Agboola
First Vice President 1971-1984.



Prof Gabriel O. Obigbesan
First Treasurer 1971-1984

Chief A. O. Nnodi
Former Director, Federal Ministry Of Agriculture & Natural Resources



Professor Olaolu Babalola,
Editor-in-Chief of the Society Journal from 1985-2000

MEMBERSHIP TRAJECTORY

The Constitution and bye – laws of the Soil Science Society of Nigeria provides for the following classes of membership, namely ordinary membership, corporate membership, students membership, honorary membership and Life membership. Ordinary membership is open to all persons who are working with soil and are interested in the objectives of the society. Corporate membership is open to any group of people or organization which is interested in the objects of the society. Students' membership is open to students in recognized professional or academic institutions interested in the objectives of the society. Honorary membership is by recommendation to the executive committee and approval by the house. Life membership is open to an ordinary member of the society above the age of 50years that desires it.

Membership of the society has grown over the years from a few foundation members at inception to a current figure of one thousand, five hundred members. Similarly, attendance at conferences has increased from less than 30 at the first conference to 60 in 1986, 200 in 1999, 250 in 2010 and to 450 active members in 2018. As the membership grows, the activities and impacts of the society on national development continue to grow.

In the 1980s, enrolment fees were ten Naira for ordinary members, one hundred Naira for corporate members and five Naira for student members while annual dues were fifty Naira, two hundred and fifty Naira and five Naira respectively. In 1990s, enrolment and annual dues were increased to five hundred Naira and one thousand Naira respectively for ordinary members; five thousand Naira and two thousand Naira for corporate members and one hundred Naira for student members. By the year 2000, the enrolment fees and annual dues were reviewed and an annual due for corporate members was increased to five thousand Naira per annum. Student subscription was increased to two hundred and fifty Naira for enrolment and five hundred Naira for annual dues. Life membership (open to ordinary members only) was introduced. At the present, the subscription for life membership is one hundred thousand Naira for members above 50 years of age and One hundred and fifty thousand Naira for members below 50 years of age.

FELLOWSHIP AWARDS

The constitution and bye laws of the Soil Science Society of Nigeria provides for deserving members to be honoured as Fellows of the Society. Recipients of this honour must be members who have made worthwhile contributions to the Society with proven records of scholarship, public service, in good standing and must have been active members of the Society for at least 10 years. Award of fellows of the society started in 2003 when the first 6 awards were conferred on prominent members at the 28th annual conference held at Umudike in Abia State. In the same year, two organizations that have distinguished themselves in large scale sustainable agricultural production were honoured as honorary members. The official record of the society (table below) has a list of sixty–five members so far conferred with the fellow of the society.

Members conferred with Fellow of the society in 2018

Some fellows of the Society in 2015

Name	Affiliation	ID
Prof. A. Agboola	A retired Professor of Soil Fertility and Plant Nutrition in the Department of Agronomy, University of Ibadan.	F-2003-001
Prof W.O. Enwezor	A professor of Soil Fertility and Plant Nutrition at the University of Nigeria Nsukka, now retired. He served the society as Secretary and President.	F-2003-002
Prof. Abayomi G. Ojanuga (Late)	A pedologist and one time President of the Society (1988-1992), Vice President (1984-1988). He is now late.	F-2003-003
Prof. G. Lombin	A retired Professor of Soil Fertility and Plant Nutrition. He is a one-time President of the Society (1998-2000).	F-2004-004
Prof. Rauf. A. Sobulo (Late)	A one-time President of SSSN, was a Professor of Soil Fertility.	F-2004-005
Prof David O. Ataga	A one-time President of the Society retired as an Executive Director of NIFOR.	F-2005-006
Chief A.O. Nnodi (Late)	Retired Director in the Ministry of Agriculture.	F-2005-007
Prof Eno J. Udo (Late)	A retired professor of Soil chemistry at the University of Ibadan.	F-2005-008
Prof V.O. Chude	Professor of Soil Fertility and Plant Nutrition, he was the immediate Past President of SSSN and the current Registrar of NISS	F-2007-012
Prof I.E. Esu (OFR)	A Professor of Pedology, former Vice-Chancellor of University of Calabar and currently, the Deputy Governor of Cross River State	F-2010-013
Prof A.A. Ogunkunle	A retired Professor of Pedology and currently the President of the Council of NISS.	F-2010-014
Prof A.O. Babalola (Late)	Professor of Soil Physics, retired from the University of Ibadan. A former editor of the society Journal.	F-2010-015
Prof T.A. Okusami	A Professor of Pedology who retired from the Obafemi Awolowo University Ile-Ife. He is currently the Chair, Honours and Award Committee of the Society.	F-2010-016
Prof S.O. Ojeniyi	A Professor of Soil Physics; former Secretary and former Editor-In-Chief of the Society s Journal.	F-2010-017
Prof O.O. Agbede	A retired Professor of Soil Fertility and Plant Nutrition. He has served the society as Financial secretary and as Vice-president.	F-2010-018

Name	Affiliation	ID
Prof P.O. Aina	He is a Professor of Soil Physics and a former Vice Chancellor of the Ekiti State University, Ado Ekiti.	F-2010-019
Prof A. Olayinka	A Professor of Soil Microbiology, former Business Manager for the SSSN Publications, retired from Obafemi Awolowo University, Ile-Ife	F-2010-020
Prof J.A.I. Omueti	A retired Professor of Soil Chemistry from the University of Ibadan, Ibadan.	F-2010-021
Prof Olu Obi	A Professor of Soil Microbiology retired from Obafemi Awolowo University, Ile-Ife and has been treasurer of the society.	F-2010-022
Prof. G.O. Obigbesan	An Emeritus Professor of Soil Fertility and Plant Nutrition at University of Ibadan, is a former Secretary and Editor-In-Cheif.	F-2010-023
Chief C.O. Ezendu	A retired Director of the Federal Ministry of Agriculture was an ex-officio between 2004-2018.	F-2010-024
Prof B.A. Raji	Prof Raji is a Pedologist and current President of the society. He was a former Vice President, former Treasurer and former Assistant Secretary of the society. He was a former Vice Chancellor of Fountain University, Osogbo.	F-2010-025
Dr Jimmy I. Ibanga (Late)	The late Ibanga was a pedologist and Lecturer with the University of Calabar.	F-2012-026
Prof Mariam G. Solomon	She is a Professor of Soil Microbiology with the University of Calabar, Calabar.	F-2012-027
Dr Umoru Omoti (Late)	Late Dr. Omoti was a former Executive Director of NIFOR, Benin City and former President of the Society (2000-2004).	F-2012-028
Prof F.O.R. Akamogbo	A Professor of Pedology retired from the University of Nigeria, Nsukka.	F-2013-029
Prof Adewale Adebayo	Professor of Soil Microbiology, retired from the Obafemi Awolowo University, Ile-Ife.	F-2013-030
Prof Caroline C. Mba	A retired Professor of Soil Microbiology from the University of Nigeria, Nsukka.	F-2013-032
Prof Akim O. Osunde	A Professor of Soil Microbiology with the Federal University of Technology, Minna	F-2013-033
Prof M.A.N. Anikwe	A Professor of Soil Physics with the Enugu State University of Science and Technology; a former Financial secretary and current Editor-In-Chief of the society.	F-2013-034

Name	Affiliation	ID
Dr (Mrs) F.I.Oluwatoyinbo	A former Provost of the Federal College of Agriculture, Ibadan is a Soil Fertility expert.	F-2013-035
Prof C.L.A. Asadu	He is a Professor of Pedology and one time chair of LOC. He is a member of NISS council.	F-2014-036
Prof U.C. Amalu	A Professor of Soil Fertility and Plant Nutrition and currently the DVC, University of Calabar.	F-2014-037
Prof J.A. Adediran	He is a Professor of Soil Fertility and Plant Nutrition and the current Executive Director of IAR&T, Ibadan. Former Secretary of SSSN.	F-2014-038
Prof A.S. Fasina	A Professor of Pedology and current DVC, Ekiti State University Ado Ekiti. He chaired the LOC for the 34th Annual Conference.	F-2014-039
Prof B.H. Usman	He is a Professor of Soil Physics and former Vice Chancellor, Modibbo Adama University of Technology, Yola.	F-2014-040
Prof A.M. Kundiri	A Professor of Pedology and current Vice Chancellor of the Federal University Wukari.	F-2014-042
Dr N.O. Aisueni	A Soil Chemist at the Nigerian Institute for Oil Palm Research, Benin City.	F-2014-043
Prof N. Isirimah (Late)	A Professor of Environmental Soil Chemistry at the River State University of Science and Technology, Port Harcourt.	F-2014-044
Prof T.O. Ibia	Professor of Soil chemistry at University of Uyo and former DVC of Uniuyo. One time chairman of LOC. Member of NISS council.	F-2014-046
Prof J.D. Kwari	Pedologist and Professor at University of Maiduguri.	F-2015-050
Prof G.I.C. Nwaka	Pedologist and professor at University of Abuja. Vice president of NISS council.	F-2015-051
Prof G.A. Oluwatosin	Pedologist and professor at IAR & T.	F-2016-052
Prof N.N. Oti	Professor at Federal University of Technology, Owerri.	F-2016-053
Dr A.O. Ano	Soil chemist and Director at National Root Crops Research Institute, Umudike. A one-time Assistant Secretary of SSSN.	F-2017-054

Name	Affiliation	ID
Dr E.U.O. Okoye	A retired Deputy Director of the Federal Ministry of Agriculture.	F-2017-055
Mr Olabode Ojuola	A retired Deputy Director of the Federal Ministry of Agriculture; currently managing an NGO.	F-2017-056
Prof Abdullahi Bala	A Professor of Soil Microbiology; current Vice Chancellor of the Federal University of Technology, Minna	F-2017-057
Prof Felix N. Ikpe	Professor of Soil Chemistry at University of Port Harcourt.	F-2017-058
Prof L.B. Taiwo	A Professor of Soil Microbiology from the Institute of Agricultural Research and Training, Ibadan.	F-2017-059
Prof A.A. Amusan	A retired Professor of Pedology from Obafemi Awolowo University, Ife.	F-2017-060
Prof E.A. Aduayi	A retired Professor of Soil Fertility and Plant Nutrition from Obafemi Awolowo University, Ife.	F-2013-031
Prof Jibrin Jibrin	A Professor of Soil Fertility and Plant Nutrition from Bayero University, Kano and the current Director of the Centre for Arid Research.	F-2018-061
Prof S.A. Ibrahim	A Professor of Soil Fertility and Plant Nutrition; former Vice Chancellor of the Abubakar Tafawa Balewa University , Bauchi. A member of NISS council.	F-2018-062
Prof D. O. Asawalam	A Professor of Soil Fertility and Plant Nutrition at Michael Okpara University of Agriculture Umudike, (MOUAU); a former Assistant Secretary and current Vice President of the society.	F-2018-063
Prof P.I. Ogban	A Professor of Soil physics at University of Uyo and current Secretary General of the society.	F-2018-064
Prof. F. K. Salako	A Professor of Soil Physics and current Vice Chancellor, Federal University of Agriculture, Abeokuta (FUNAB).	F-2018-065

Honorary fellow of the society may be awarded to Nigerians and foreigners, who are not members of the Society, but who have outstanding professional records and have rendered valuable services to the Society. Those honoured by the society are shown below.

Name	Bio	ID
Otunba G. Daniel	Former Executive Governor of Ogun State	HF-2003-009
Dr Sam O. Egwu	Former Executive Governor of Ebonyi State	HF-2003-010
Malam Adamu Bello	Former Federal Minister of Agriculture	HF-2003-011
Dr AkinwumiAdesina	Former Federal Minister of Agriculture	HF-2014-041
Dr Bukar Tijani	Former Federal Minister of State of Agriculture	HF-2014-047
ChiefGodswillAkpabio	Former Executive Governor of AkwaIbom State	HF-2015-048
Dr David Sasseville		HF-2015-049
Chief Audu Ogbe (OFR)	Current Federal Minister of Agriculture	HF-2017-061
Sen Heineken Lokpobiri	Current Federal Minister of State of Agriculture	HF-2017-062

ACHIEVEMENTS OF SSSN IN FIVE DECADES

This section presents some of the notable activities of the Soil Science Society of Nigeria which has positively impacted on Agricultural development of Nigeria. It should be mentioned that as a strategy to study all the soils of Nigeria, the society from inception has a policy to rotate her annual scientific meetings from one part of the country to another. This annual meetings afforded members the opportunity to study important agricultural soils of the host states and make recommendations to the state for more appropriate use and management. SSSN is convinced that planning for food production without planning for proper land use and soil fertility management is planning for unsustainable food production. Consequently, the society at every conference, examines model soil profile of the important agricultural soils of the host State, and discusses their problems, prospects and management options. This forms the basis of the recommendations made to the states.

First decade (1969-1978),

- University of Ife, (now Obafemi Awolowo University) hosted the National Conference of the Soil Science Society of Nigeria in 1971.
- In 1972, the National Conference of the Soil Science Society of Nigeria was held in Kano.
- The National Conference of the Soil Science Society of Nigeria was held at Calabar in 1973.
- In 1977, Ahmadu Bello University, Zaria hosted the National Conference of the Soil Science Society of Nigeria.
- In 1978, University of Nigeria, Nsukka was the venue of the National Conference of the Soil Science Society of Nigeria.

Second decade (1979-1989),

- Following the recommendation of the Soil Science Society of Nigeria, a Department of Agricultural Land Resources was created in the Federal Ministry of Agriculture and Natural Resources in 1979.
- Reconnaissance Soil Survey of Nigeria project which started in 1980 was executed by the Federal Department of Agricultural Land Resources in collaboration with Soil Science Society of Nigeria.
- In 1980, SSSN in collaboration with Fertilizer Procurement and Distribution Department of Federal Ministry of Agriculture, Water Resources and Rural Development, published the first edition of the book 'Fertilizer Use and Management Practices for Crops in Nigeria.
- Acid Sands of southern Nigeria was published in 1981. The Special monograph No. 1 focuses attention on the extent of occurrence, geology, characteristics and erosion hazards of acid sandy soils as well as the problems associated with their management for crop production.
- 1984 – SSSN commissioned the publication of a monograph on the status of knowledge and potentials of wetland soils in Nigeria.
- The 1986 annual conference of SSSN with the theme 'Soils, Fertilizer and Food Production' examined the soils of Benue State and their capabilities, use and misuse of fertilizers, and soil testing issues.
- With the theme 'Soil Resources for Rural Development' the 1987 conference of the society focused attention on the soils of Kaduna State.
- 1987 – SSSN in collaboration with International Society of Soil Science organized an International conference on 'Soil Fertility, Soil Tilt and Post – Clearing Land degradation in the Humid Tropics.
- In 1988, soils of Niger State were examined with the theme 'Soil conservation, soil testing and fertilizers for continuous food production'

- At the 1989 conference at Nsukka, the society focused attention on the soils of Anambra State with the theme 'Soil Management for erosion control and pollution control.
- In 1989, SSSN in collaboration with Fertilizer Procurement and Distribution Department of Federal Ministry of Agriculture, Water Resources and Rural Development, published the revised edition of the book 'Fertilizer Use and Management Practices for Crops in Nigeria.
- NICANSOL project officially commenced.

The Participant of the 14th Annual Conference
on Soils, Fertilizers and Food Production, 'Makurdi 86'
(19-23rd October, 1986)

Third decade (1990-2000),

- 1990 - The reconnaissance soil survey of Nigeria was concluded with the production of soil reports in four volumes as well as soil maps. Soil Science Society of Nigeria conference for the year 1990 was held at University of Maiduguri, Bornu State.
- 1991 – SSSN in collaboration with Fertilizer Procurement and Distribution Department (FPDD) and Federal Ministry of Agriculture and Natural Resources organized a Seminar in Kaduna State on the theme ' Organic Fertilizer in Nigerian Agriculture: Past and future. Soil Science Society of Nigeria conference for the year 1991 was held at University of Ife, Ile – Ife (now OAU).
- 1992 – National conference of Soil Science Society of Nigeria was hosted by University of Ilorin.

- 1996 – The book 'Wetland Soils of Nigeria' was published as monograph No. 2. The first edition was published in 1996 with funding support from NICANSOL project.
- 1999 - SSSN annual conference was held at Benin City and it was an opportunity to study and make recommendations on the soils of Bendel State. The theme of the conference which held in the month of November of that year was 'Management of Soil Resources of Nigeria for Sustainable Agricultural Production in the 21st Century'.

Fourth decade (2001-2011)

- 2001 - Annual scientific meeting of SSSN moved to Calabar and it was an opportunity to study and examine the management of wetland soils of Cross River State for sustainable agriculture and environment.
- 2003 – The environmental implications of Land degradation for Agricultural Productivity and Rural Poverty were the focus of the discussions at the conference in Umudike that examined the soils of Abia State.
- The second edition of 'Wetland Soils of Nigeria' was published in 2003.
- Award of Fellows of Soil Science Society of Nigeria (FSSSN) to deserving members started with the award of the first six Fellows.
- 2004 - Annual scientific meeting of SSSN was hosted by Federal University of Agriculture, Abeokuta and it was an opportunity to study the soils of Ogun State.
- 2005 – The conference in Makurdi, Benue State examined the management of Fadama soils for environmental quality, food security and poverty alleviation in Nigeria.
- 2008 – The conference was moved to Yola, Adamawa State with the theme 'Soil and water management for sustainable environment and economic empowerment.
- 2009 – The Society met at Ekiti State in 2009 and deliberated on Management of Nigerian Soil Resources for enhanced agricultural productivity.
- 2010 – At the conference in Ibadan in 2010, the society discussed 'Emerging challenges to soil resources in times of global Climate Change and food crisis.
- 2011 – The scientific meeting was moved to Mina in Niger State and 'Soil Resources Management, Global Climate Change and Food Security' was the theme of the discuss.
- 2011 – Soil physics workshop was held in Zaria, Kaduna State by SSSN in collaboration with the College of Soil Physics of International Centre for Theoretical Physics, Trieste, Italy.

Some Faces at Ado – Ekiti Conference in 2009




Some faces at Ibadan 2010




Some faces at Minna 2011




Fifth decade (2012-2019)

- 2012 – Discussion at the 36th conference held at Nsukka, Enugu State centred on Climate Change, Soil Management Alternatives and Sustainable food production.

- 2013 – The conference of SSSN was held at Lafia Nasarawa State and the society focused attention on the soils of Nassarawa State with the theme 'Soil Science, Environmental Management and Food Security'.

- 2014 – The scientific meeting moved to Uyo, Akwa Ibom State in 2014. With the theme 'Nigerian Agricultural Transformation Agenda: Soil as key to National Development' the society examined the key role that soils should play in realizing the objectives of Agricultural Transformation Agenda (ATA).

- 2015 – At Omu-Aran in Kwara State, the annual conference examined the issues of Food and Nutrition Security in the face of Climate Change with the theme 'Managing Nigerian Soils for Food Nutrition Security and Climate Adaptation and Mitigation.

- SSSN Celebrated International Year of Soils (IYS) with the theme ' Healthy Soils are the basis for healthy food production'

- 2017 – At Bauchi State, the society examined soil – related aspects of Sustainable Development Goals with the conference theme 'Land Degradation, Sustainable Soil Management and Food and Nutrition Security'.

- 2018 – The conference returned to Ibadan with the theme 'Sustainable Management of Soil and Water Resources for Food Security, Climate Change Adaptation and Mitigation'.

- 2016- At Calabar, Cross River State, the annual conference theme was focused on soil management of acid soils

Some faces at the 2012 conference at Nsukka




Some participants at Lafia 2013 conference

Participants at 2014 conference at Uyo, Akwa Ibom State

At 2015 conference in Kwara State

Participants at 2016 conference in Calabar

CHAPTER II

TRACTS OF DEVELOPMENT IN THE STUDY OF SOILS SCIENCE IN NIGERIA

BY

[1]Amalu U. C., [2]Lekwa G. U. and [3]Aina P. O.

[1]Department of Soil Science, University of Calabar, Calabar, Nigeria.

[2]Department of Soil Science and Meteorology, Michael Okpara University of Agriculture Umudike, Nigeria. [3]Department of Soil Science, Federal University, Ado-Ekiti, Ekiti State Nigeria.

Study of Soil Science in Nigeria: Historical Development.

Since men settled down and ceased to be hunters and gatherers, there has been constant, although informal, efforts to study and improve agricultural practices. Until very recently, however, agricultural practices proceeded by trial and error, with farmers selecting the "best" seed to plant the following season sweetest (most fertile) soils to plant his best seeds or the "best" animals to breed the next generation. Not until the dawn of modern age in the seventeenth century, did agricultural research become scientific, first by systematising the collection growth and transfer of plants, and only later by engaging in laboratory and field experiments.

Historians have long noted that the 17th century marked a turning point in the history of Western civilisation. This century saw the establishment of hundreds of botanical gardens in Europe and its colonies. By 1800, over 1600 botanical gardens were in operation, making possible the transfer of plants from one colony to another as well as their economic evaluation and botanical classification (Brockway, 1979). By supporting the development of plantation crops in the colonies, the botanical gardens contributed to the development of modern agricultural practices.

The 19th century saw several major changes in the nature and development of agricultural research; whereas previous methods involved careful screening, they had not involved experiment. However, in the 1840s, a movement arose in Germany to create what soon came to be called Experiment Stations. These experiment stations, at first little more than a field set aside in order to see what would grow, gradually evolved into the large agricultural research institutions found throughout the world today. By 1900, over 800 of these stations could be identified around the world, and by 1930, over 1400 existed (Busch and Sachs, 1981).

Among the important innovations incorporated into the experiment stations was the idea of simple variety testing. Concurrent with the creation of the experiment stations, the bases for contemporary plant and animal science were being laid in Europe. The crop sciences were greatly influenced by Justus Liebig a German Chemist, who was concerned with the predictions of the economist Richard Malthus. Malthus had argued that since population tended to increase geometrically, while agricultural production increased only arithmetically, human beings would always be in danger of mass starvation. Liebig, like many of his contemporaries, was frightened by this prospect. However, Liebig concluded that catastrophe could be avoided if means were developed to increase agricultural production. After much research, he identified nitrogen, potassium and phosphorus in soil or water media as the three essential elements for plant growth. Within a short time, Liebig's findings were publicized around the world. Simultaneously, the animal sciences were being shaped by the work of Frenchman, Louis Pasteur, who was both interested in agricultural improvement and an active promoter of scientific agriculture.

BEGINNING OF THE STUDY OF SOIL SCIENCE IN THE REGIONALIZED AGRICULTURAL STATIONS.

Liebig's findings marked the beginning of the appreciation of soils media and probably the beginning of the study of soils as a subject?. In Nigeria, Agricultural research began in the regionalized agricultural stations during the colonial era. Matter-of-factly, agricultural research began in the old Western region, in the days of Claude MacDonald, with the establishment of the Botanical Station at Ebute-Metta in 1893. Six years after the establishment of the Botanical Station, precisely, in 1899, Moor Plantation was established to become the oldest Agricultural station in Nigeria. It was established as a model farm with the objectives of propagating rubber trees and general agricultural improvement. The idea of developing agricultural departments to study and solve agricultural problems was recognised the same year. Thus, 1899 marked the beginning of agricultural research (soils, crops and animal etc) in Nigeria. With this development, the training of agricultural Cadets commenced in the station in 1900. At this time four 'pupils' were initially admitted into the garden; Samuel Adewusi, Nathan Philips, Josiah Thomas and Cornelius George, who were trained in the practice of tropical horticulture and general cultivation such as garden works and the use of tools (Dawodu, 1901). By 1942, some specialist staffs (silviculturists, utilization assistant, etc.) had graduated and were called "Research Officers" (Ayoola and Idachaba, 1990).

The station became an experimental station in 1905, largely for research activities on cotton to feed the textile industries through an association of member farmers called British High Commissioner, Sir Ralph Moor who was immortalized in the name Moor Plantation. In 1910, Moor Plantation became the Headquarters of the

Department of Agriculture and later, in 1915, became a place for the establishment of botanical laboratory. Following the demand for training of members of staff and the potential farmers, the school of Agriculture now, Federal College of Agriculture was established in 1921 by Mr. O. T. Faulkner, the Director of Agriculture in Nigeria. The mandate was to train Agricultural Assistants in Nigeria and West Africa at large. In 1921, the Federal College of Agriculture, Ibadan (formerly called school of Agriculture) was established to become the first Agricultural institution in Nigeria and even in West Africa. The history of this great citadel of learning is intricately woven with the history of Moor Plantation and Agricultural Development in Nigeria. It is not an over statement that Moor Plantation was the origin of formal agricultural training in Nigeria. Then, agricultural research and extension were under the Botanical Research Scheme. This arrangement continued until 1921 when O. T. Faulkner commenced execution of functions as Director of Agriculture.

In Eastern Nigeria, the study of Soil Science started on 1st of January 1923, with the establishment of a provincial research farm, under the Nigeria Department of Agriculture, with the headquarters at Moor Plantation, Ibadan. In 1955, it came under the Eastern Region Ministry of Agriculture and became known as Agricultural Research Station (ARS), Umudike. The Agricultural Research Station is what today is known and called National Root crops Research Institute, NRCRI, Umudike. In the same 1955, on 29th day, October, an independent agricultural establishment, known as School of Agriculture was established. It was owned and financed solely by the then Ministry of Agriculture of Eastern Nigerian Government, under the headship of Honourable Minister of Agriculture, Hon. E. Emole. In 1964, the school of Agriculture was amalgamated with the Agricultural Research Station, Umudike to form the Agricultural Research and Training Station (ARTS). This integrated set up was to be financed by the United States Agricultural and Industrial Development Agency (USAID), through the Colorado State University Contract, but this collaboration never materialized owing to the civil war. At the end of the civil strife, the then East Central State Government took over the financing of the ARTS, and in 1973, ARTS was in turn taken over by the Federal Government of Nigeria and administered by the Federal Ministry of Natural Resource, Lagos; under a new name - Federal Agricultural Research and Training School. In 1975, the Federal Government bifurcated the establishment into two – a research arm and a training arm. While, Government re-named the research arm the National Root Crops Research Institute (NRCRI), Umudike, the school arm, then situated on a 52 hectare land, became known as – Federal College of Agriculture and relocated to Ishiagu in the present Ivo Local Government area, Ebonyi State. From inception, the School

trained manpower for the Agricultural sector of the economy, and pioneer graduates were called Agricultural Assistants (AAs) and courses, including Soil Science (Soil Chemistry, Soil Fertility and Soil Survey) were taught. The College commenced the award of Diplomas in 1975 and the Pioneer Provost of the Federal College was Dr. Michael C. Igbokwe, a Soil Scientist. The NRCRI has a functional Division, called Soil Science Division, where researches on various sub-specialization areas of Soil Science are carried out. Late Professor Eno Jumbo Udo, a renowned Soil Scientist, worked in the Soil Science Division as an Agricultural Assistant before proceeding to the University of Ibadan for his degree. The first Head of the Soil Science Division was now late S. C. O. Nwinyi, followed by Late Dr. B. O. Njoku and thereafter Dr. A. C. Ohiri. The erstwhile Head of the Division was Dr. Anthony O. Ano, while the present Head is Dr. L.I. Chukwu.

In Northern Nigeria, the Institute for Agricultural Research (IAR), Samaru, Zaria was established in 1922, as the research division of the Department of Agriculture for the defunct Northern region of Nigeria. IAR was formally transferred by law to the later established Ahmadu Bello University (ABU) in October, 1962. With the federalization of universities in Nigeria in 1975, The Institute, in accordance with the statute 14 of the University, became affiliated with the Ahmadu Bello University and ever since has remained the backbone of Crop and Soil Research and Improvement in the Savanna Region of Nigeria.

Although the Institute for Agricultural Research is affiliated to ABU, it has been and continued to be funded and supervised by the Federal Ministry of Agriculture and Rural Development (FMA RD) and Agricultural Research Council of Nigeria (ARCN) respectively. IAR has a joint ABU/IAR Academic Department housed under the Faculty of Agriculture.

The Departments include:
Agricultural Engineering
Agricultural Economics
Agricultural Extension and Rural Sociology,
Agronomy,
Crop Protection
Plant Science and Soil Science.
Other programmes include
Forestry and Wildlife
Fishery and Aqua-culture.

In the Mid-west Nigeria, the course of development changed from the study of soils which supported arable crops to those of tree crops and this led to the establishment

of the present day Nigerian Institute for Oil Palm Research (NIFOR). In 1939, the Oil Palm Research Station (OPRS) was established as a research unit of the British Colonial Empire headquartered in the then Gold Coast (now Ghana). The original mandate of OPRS was to conduct research on the agronomy of Oil Palm (Elaesis guineenesis Jacq.), which was the choice cash crop of the colonial masters because of its export value. Mandate crops have since been enlarged to include Coconuts *(Cocos nucifera Linn.)*, Raphia *(Raphia spp)*, Date Palm *(Dactylfera* and recently Shea-Butter and Jojoba crops. The study of soils supporting such oil crops and oil seeds therefore commenced in the late thirties in Nigeria. The first studies were on Soil Surveys aimed at classifying and establishing reference soils by Vine (1954, 1956), followed by those of Tinker and Ziboh,(1959). These were followed immediately after with "Investigations on Phosphate and Micronutrient depletion rates in "reference soils" supporting Oil Palm trees in Southern Nigeria (Oviasoghie, Ikuenobe, Okoh-Obo, Osayande and Okpamen, 2019). The results showed first that nearly all the soils supporting oil palm were primarily "Acid Sands" soils which were (and still are) developed on tertiary and cretaceous sediments, and on unconsolidated sandstones or Benin Fascs and that an overwhelming majority of the Oil palm trees and seedlings showed large responses (in terms of Dry matter yields) to Phosphate fertilizer treatments that pale-olive coloured oil palm leaves with chlorotic tips) reversed to dark green colours a few months after treatment. The original name of the Institute had undergone several baptismal changes to West African Institute for Oil Palm Research (WAIFOR) in 1959, and from 1963, Nigerian Institute for Oil Pam Research (NIFOR).

Soil Scientists in Universities and Research Institutes

Until about the mid-1960s much of the work on Soil science in Nigeria was on Soil Survey and Soil Mapping of Soil Series at varying scales, as well as in promoting soil conservation practices. During the stated period, Soil Science as a subject enjoyed very rapid development owing to the massive Faculty development at the first generation Universities of Nigeria at Nsukka, University of Ibadan and Ahmadu Bello University at Zaria wherein then young faculty members were sent abroad primarily to the United States and United Kingdom for graduate studies. Some of these young faculty members include G. A. Ojanuga, Fagbami, Akinola A. Agboola, Olaolu Babalola and G. O. Obigbesan from Western Nigeria; Nelson Egbe, A.C. Ohiri, S. C. O. Nwinyi, G. U. Lekwa, F. O. R. Akamigbo, E. J. Udo, D. M. Ekpete, E. O. Enwezor, E. O. Opuwaribo, N. O. Isirimah, Unamba-Opara and B. O. Njoku from eastern Nigeria and Klinkenberg, and Dr Kalamka, E. O. U. Okoye, F. O. Uzu, O. U. Onuwaje, Umoru Omoti, A. O. Ogunkunle, followed by E O. Akhimien, N. O. Asueni and Isenmila from the Mid-Western Nigeria. On return at various times, these pioneer graduates of Soil Scientists came together to plan and establish the Soil Sience Society of Nigeria in 1968.

Structures and Institutions for the study of Soils and Soil Science

The secondary and tertiary in Nigeria that form the basic structure of soils study in Nigeria are the Universities and research institution. About 80% of the Colleges of Agriculture and Universities offering soil science in the curriculum mainly offer it for the purpose of supporting the agriculture and crops cultivation (agronomy), another overlapping 50% offer soil study to support the environment, while a least group offer as part of civil engineering and geotechnical investigations (soil mechanics). The institutions are mainly for teaching and research, and has three prongs: Agronomic soil science, Environmental Soil science and Engineering Soil science.

3. Soil Science Curriculum and Development

The phrase Curriculum and Teaching Development (CTD) describes planned total experience (s) of a person (student) on a named course (body of knowledge) from the beginning to the end of duration in a learning environment. Curriculum specifically describes "a systematic group of courses or sequences' of subjects and planned experiences required for certification and/or graduation of a learner under the guidance of a teacher in a school" It is "the entire body of courses offered by a school, including the selection, organization and refinement of knowledge, understanding, attitudes, skills, values and behaviour to be transmitted to the students ". Curriculum development therefore describes modifying, bringing in of new ideas, methods or making changes on existing curriculum to suit current or future educational needs. On the other hand, teaching describes the process of imparting knowledge or a body of knowledge of a subject matter (course). In the context of this description, process involves methods and/or techniques of delivering the contents of the subject matter. For purposes of clarity, we have separated the courses along relevance and application- utilization: Preparatory courses, General Agriculture courses and Core Soil Science courses

PREPARATORY COURSES:

BIO101: Introductory Biology I (2CH)
CHM101: Introductory Chemistry I (2CH)
MTH111: Algebra And Trigonometry (2CH)
PHY101: Introductory Physics 1 (2CH)
GSS101: Use Of English & Communication Skills 1 (2CH)
GSS121: Philosophy And Logic (2CH)
GSS141: Anti Corruption 1 (2CH)
BIO 102: Introductory Biology II(2 CH)
CHEM 102: Organic Chemistry (2 CH)

GSS102: Use Of English & Communication Skill Ii (2 CH)
MTH 132: Coordinate Geometry And Calculus (2 CH)
PHY 102: Introductory Physics II (2 CH)
GSS112: Citizenship Education (2 CH)
GSS 132: History and Philosophy Of Science (2 CH)
GSS 142: Anti Corruption II (2 UNITS)
GSS 211: Introduction to Computers (2 CH)
GSS 301: Entrepreneurship Education I (2CH)
AGR 352: Statistics & Experimental Designs (2 CH)
AGF 342: Introduction to Fisheries and Wildlife (2 CH)
GSS 212: Computer Applications (2 CH)
GSS 302: Entrepreneurship Trade Skill (2 CH)
AGF 551: Environmental Impact Assessment In Natural Ecosystem (2CH)
AGS 321: Application of Computers To Agriculture & Soil Sc (2 CH)

GENERAL AGRICULTURE COURSES:

AGR111: Introduction To Agriculture 1 (2CH)
AGR112: Introduction To Agriculture II (2 CH)
AGR 221: Introduction To Agricultural Biochemistry (2 CH)
AGR 231: Introduction To Organic Agriculture (2 CH)
AGA 211: Principles of Animal Production (2 CH)
AGE 211: Introduction To Agricultural Extension And Rural Sociology (2 CH)
AGC 211: Principles of Crop Production (2 CH)
AGR 211: Climatology and Biogeocraphy (2 CH)
AGC 211: Crop Botany (2 CH)
AGR 242: Principles of Food Science And Technology (2 CH)
AGR 222: Introduction To Agricultural Engineering (2 CH)
AGC 222: Introduction To Crop Physiology (2CH)
AGC 232: Cytology and Genetics (2CH)
AGR 212: Introduction To Agricultural Biochemisry (2CH)
AGA 222: Anatomy and Physiology of Farm Animals (3CH)
AGR 232: Introduction To Forestry & Wildlife (2CH)
AGR 242: Principles of Food Science and Technology (2CH)
AGR 301: Agricultural Mechanization (2 CH)
AGA 311: Non Ruminant Animal Production (2 CH)
AGC 311: Field Crop Production (2 CH)
AGC 321: Principles of Crop Protection 1 (2 CH)
AGE 311: Farm Management and Production Economics (2 CH)
AGR 321: Agricultural Biotechnology (2CH)
AGA 322: Ruminant Animal Production (2 CH)

AGA 332: Animal Genetics And Breeding (2 CH)
AGC 322: Principles of Crop Protection Ii (2 CH)
AGC 332: Tree Crop Production (2 CH)
AGE 322: Extension Education (2 CH)
AGR 312: Farming Systems (2 CH)
AGR 410: Farm Design And Agricultural Mechanization Practice (2CH)
AGC 411: Permanent Crop Production Techniques (2 CH)
AGC 421: Horticultural & Permanent Crop Pest & Diseases Mgt (2 CH)
AGE 401: Farm Management and Accounting 1 (2 CH)
AGX 411: Participation In Agric Extension (2 CH)
AGR 422: Workshop Practices (2 CH)
AGA 412: Ruminant Animal Management Techniques (2 CH)
AGA 422 Animal Health Management II (2 CH)
AGC 420: Arable Crop Production Techniques (3 CH)
AGC 422: Arable Crop Pest And Disease Management (1 CH)
AGE 420: Farm Management and Records II (2 CH)
AGX 420: Farm Survey and Extension Practices (2 CH)
.AGR 432: Scientific Report Writing (2 CH)
AGR 412: Viva Voce (2 CH)

First Tertiary Institution for Agriculture in Eastern Region

Institute of Agricultural Research & Training, Ibadan

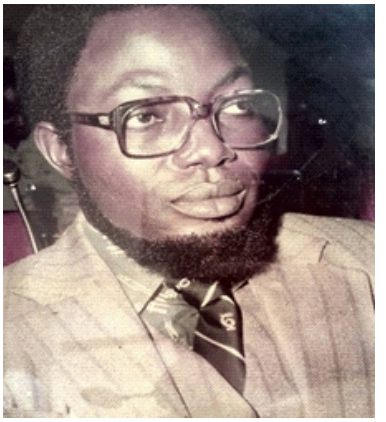
Graduating Students of Federal College of Agriculture Ishiagu

First Tertiary Institution for Agric in Northern Region

FACES OF SOME SENIOR SOIL SCIENTISTS WHO TAUGHT IN VARIOUS INSTITUTION

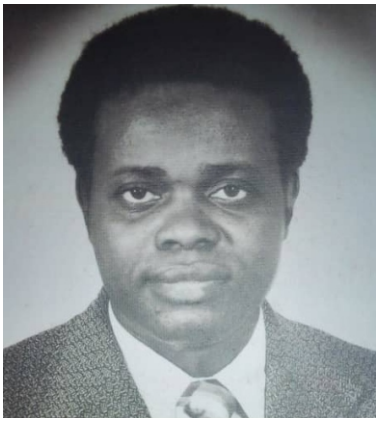
Prof. Uzo Mokunye

Late Dr. I. J. Ibanga
(University of Calabar, Calabar)

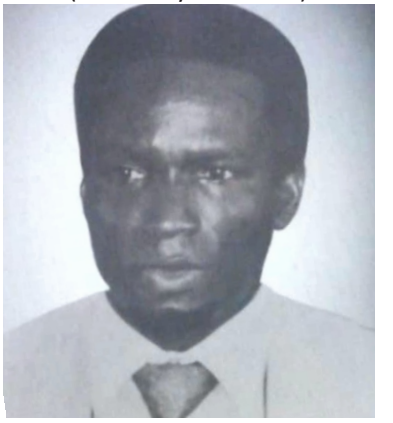


Prof Frank Akamigbo
(University of Nigeria, NSUKA)

Prof Omueti
Business Manager 1987-1994
(University of Ibadan)



Late Prof C.T.I. Odu,
(University of Ibadan)



Late Professor Ayodele A. Fagbami,
(University of Ibadan)

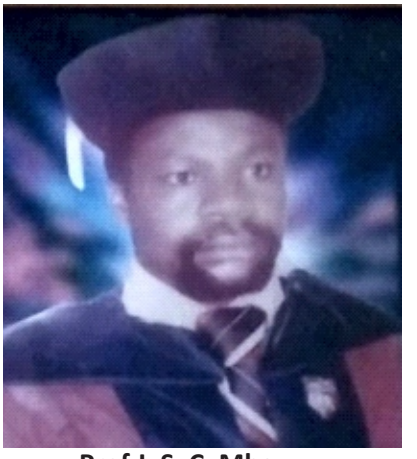
Late Prof. E. J. Udo

Late Prof. T. Kparmwang
Ahmadu Bello University, Zaria

Prof. M. T. Adetunji
Fed. Uni of Agriculture, Abeokuta

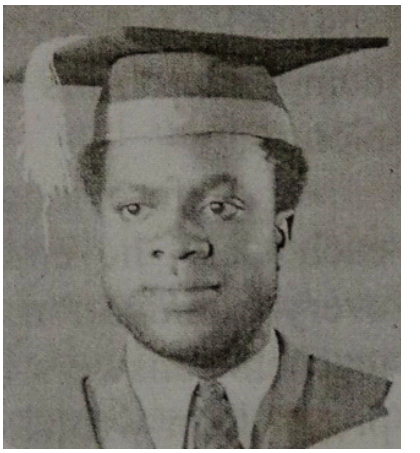
Dr. E. N. O. Iwuafor
Ahmadu Bello University, Zaria

Dr. (MRS) V. U. Aiboni
Fed. University of Agriculture, Abeokuta

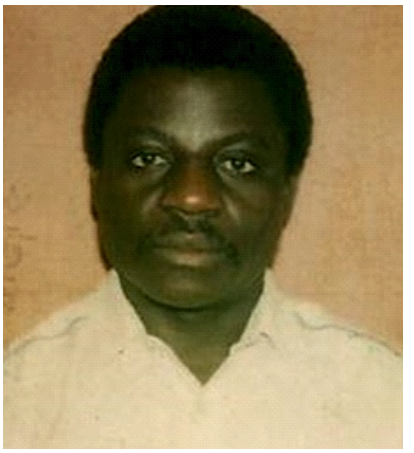


Prof J. S. C. Mbagwu
(University of Nigeria, NSUKA)

Sir Ralph Moor
(British High Commissioner, 1905)



Late Prof. D. M. Ekpete
(University of Nigeria, NSUKA)



Prof. Olusola O. Agbede
Vice President 2003-2012

Prof. J. A. Ogunwale
University of Ilorin, Ilorin

Elder Soil Scientists at Ibadan 2011 Conference in a relaxed mood and Ibadan 2018 conference fieldwork.

CHAPTER III

RESEARCH PRODUCTIVITY AND PUBLICATIONS IN SOIL SCIENCE IN NIGERIA

BY

[1]Raji B. A., [2]Nwachukwu A. O., [3]Nafiu Abdu and [4]Asadu C. L. A., [5]Taiwo L. B.

[1]Department of Agronomy, University of Ilorin, Ilorin

[2]Department of Soil Science, and Meteorology, Michael Okpara University of Agriculture, Umudike

[3]Department of Soil Science, Ahmadu Bello University, Zaria.

[4]Department of Soil Science and Land Reserve management, University of Nigeria, Nsukka

[5]Institute of Agricultural Research & Training, Moor Plantation, Ibadan.

Introduction

The knowledge of soil has been in existence since 11,000 BP and evidences of the knowledge of soil since the 4th century has been reported (Brevik and Hartemink, 2010). These include irrigation, terracing as a form of erosion control and soil fertility improvement (Troeh et al., 2004). Soil science as a disciplinary research field emerged some 160 years ago with its origin in Europe, Russia and North America (Bationo *et al*., 20007). It stated in the form of soil survey in areas with ample land and as a means of improving soil condition in densely populated part of Western Europe (Bationo *et al*., 2007). Soil Science research in any nation is imperative to agricultural development and self-sustenance as no country can develop without its being able to feed itself. With the population surge in Nigeria, soil science research becomes imperative if food crisis must be averted.

Research in the field of soil science started in Nigeria in the early 1920s. The first rainfall data which is related to soil science was collected in 1924 by the Meteorological Unit of the Institute for Agricultral Research (IAR), Zaria. Malgwi (1979) reported in his MSc Thesis rainfall data collected by IAR from 1924 – 1978; similarly, Valette and Ibanga (1984) reported rainfall data from 1928 – 1983 all collected by the Meteorological Unit of IAR. This was to the best of our knowledge the first soil related data to be collected in Nigeria and marks the beginning of soil research in the country. This was followed by a detail work of de Swardit in 1946 on the history of erosion in the Kaduna valley. Among the early soil research in the country is the work of Russ (1957) that described the geology of Niger, Zaria and

Sokoto provinces. Other scientist followed in the South and their documented works include the PhD Thesis of Ojanuga in 1971 that reported the genesis of the upland soils of the South-western Nigeria.

Over the decades, soil research has witnessed tremendous development in Nigeria as scientists in the various field of soil science (Soil fertility and plant nutrition, pedology, soil chemistry and mineralogy, soil physics, soil microbiology, soil conservation etc) emerged. All their researches had been focused on improving soil condition for more food production with the ultimate aim of combating hunger and food crisis.

Methods used in assessing research output in Nigeria

Data on soil research in Nigeria was collected via online searches using Google Scholar (excluding patents and citations), and the entire online search was carried out within one hour to minimise variations in data returned. In addition, hard copies of Nigerian Journal of Soil Science, Nigerian Journal of Soil and Environmental Research, as well as Nigerian Agricultural Journal were consulted. Lastly, questionnaires were distributed to members with respect to research output and facilities available in their Institutions. The period under evaluation spanned from 1980 – 2019, and the information gathered was on research in specific sub disciplines of soil science and the institutions of their authors.

To assess research productivity in soil science in Nigeria, we divided publications into six (6) based on disciplines in soils science such as soil chemistry, fertility and plant nutrition as a discipline, climate change, environmental pollution, pedology, survey and land use planning as a discipline, soil microbiology and biotechnology as a discipline and then soil physics, conservation, soil and water as a discipline (Table 1). Authors' institutions/ affiliations were divided into five (5) categories as shown in Table 1.

Table 1. Soil research categories and Authors' Institutions

S/No	Category of Soil research	Authors' Institutions
1	Soil Physics, Conservation, Soil & water	Universities
2	Soil Chemistry, Fertility & Plant Nutrition	Research Institutes
3	Soil Microbiology, Biotechnology	Colleges of Agriculture and Mono/Polytechnics
4	Pedology, Soil Survey & Land Evaluation	Colleges of Education
5	Environment & Pollution	Others
6	Climate change	

Search words used in collecting online data of published soil research from Nigeria were carefully selected after initially trying a number of possible combinations. Specific search words finally selected for Google Scholar search were those which best captured the components of each research category while also ensuring minimal overlaps or duplication of results from more than a given/intended category of research area. These are shown in Table 2.

Table 2. Online search categories and search words used in Google Scholar (Accessed 12th March, 2019)

S/No	Categoryof Soil research	Searchwords
1	Soil Physics, Conservation, Soil & water	Soil physics, water dynamics and conservation in Nigerian soils
2	Soil Chemistry, Fertility & Plant Nutrition	Fertility and chemical processes in Nigerian soils
3	Soil Microbiology, Biotechnology	Microbiological processes in Nigerian soils
4	Pedology, Soil Survey & Land Evaluation	Classification of soils in Nigeria
5	Environment & Pollution	Environment and soil pollution in Nigeria
6	Climate change	Impact of climate change on soil in Nigeria

In order to evaluate the overall trend in soil research in Nigeria , average values were obtained for each category across the three journals per decade and then compared with those obtained from online results.

Research productivity - findings

Measuring research productivity in any scientific field of endeavor is achieved through research publications. The number of research publications is proportional to developments and advancements. Soil Science research globally can be considered very recent when compared to other basic sciences such as Physics, Chemistry and Geology. This is particularly so in Nigeria when compared to advanced countries such as UK and US. This can be clearly understood from the dates our Universities were established; the earliest being the University College, Ibadan in 1948 and many other first generation Universities in Nigeria, such as University of Nigeria, Nsukka, University of Ife (now Obafemi Awolowo University), Ile-Ife, University of Lagos, Lagos and the Ahamadu Bello University,

Zaria, all of which were established between 1960 and 1962 compared with Oxford and Cambridge (Oxbridge) Universities founded in 1096 and 1209 respectively. In general, prior to the development of Pedology in the 19th century, agricultural soil science (or edaphology) was the only branch of soil science. This represented the bias of early soil scientists who viewed soils only in terms of their agricultural potentials (production of food and fiber).Hence, it was also considered a constituent of the field of agronomy known as soil agronomy.

Soil research documented online

Online visibility of published soil research emanating from Nigeria increased exponentially from only 14,000 publications between 1980 – 1989 to more than 200,000 between 2010- 2019. A number of factors may have accounted for this quantum leap, such as

i. Increased awareness on the need to publish research findings
ii. A drive to publish in high impact, international journals by authors
iii. Progressive increase in access to the internet by Nigerian researchers
iv. A higher number of researchers having opportunities for international research through scholarships, fellowships and research collaborations with other scholars from all over the world
v. An aligning of research focus with global trends in order to stay relevant and current
vi. The global shift of publishing from hard copy to electronic versions, with the attendant ease in documentation and of circulation to a wider audience
vii. The gradual merging of our world into a global village

Between 1980 -1989, soil research in Nigeria was dominated by studies in climate change, Environment and Pollution and soil chemistry/fertility and plant nutrition, with each of these accounting for about 25% each (Table 3). This trend continued through the 1990s until 2000 – 2009.

The trend has however changed from 2010 till the first quarter of 2019, where data showed that published research on soil microbiology and biotechnology to be at par with those in climate change, soil physics and pedology, all as an average of 18% of total publications for the current decade (Table 3). This quantum leap of microbiology/biotechnology from a meager 6% in 1980 - 1989 attests to the popular claim of biotechnology as the 'research of the future'. Environment/pollution continues to lead total research output, though dropping marginally from 25% in the first three decades to 22% in the current one (Table 3). This would suggest a reflection of research based on global concerns real world -wide environmental issues of pollution and the underlying factors causing them

Evaluation of soil research in text/ hard copy publications

Figures 1 show scientific articles published in different sub disciplines of Soil Science in Nigerian Journal of Soil Science (NJSS) from 2000 – 2019, being the only periods where complete published volumes could be accessed for the journal.

For both decades, research in soil fertility/plant nutrition/chemistry made up the highest percentage, being on average 50% of total research published in NJSS from 2000 - 2019, while pedology/survey/land use planning was a distant second at 23%, with Soil physics/conservation/soil and water coming next at 16%. Research published on soil. The trend of publications in Nigerian Journal of Soil and Environmental Research (NJSER) was similar to that in NJSS, as shown in Figure 2. On average, from 2000- 2019, research in soil fertility/plant

Table 3: DISTRIBUTION OF SOIL RESEARCH PAPERS BY SUB-DISCIPLINE ONLINE

SUB-DISCIPLINE	1980-1989		1990-1999		2000-2009		2010-2019		TOTAL
	Number	%	Number	%	Number	%	Number	%	Number
Soil Physics, Conservation, Soil & water	225	1.6	471	1.6	1,640	2.4	3,590	3.7	5,926
Soil Chemistry, Fertility & Plant Nutrition	3,220	23.1	6,250	20.7	15,100	22.4	17,600	18.1	42,170
Soil Microbiology, Biotechnology	927	6.6	2,230	7.4	6,830	10.1	17,700	18.2	27,687
Pedology, Soil Survey & Land Evaluation	2,490	17.8	4,060	13.4	9,990	14.8	18,100	18.6	34,640
Environment & Pollution	3,440	24.6	7,840	25.9	16,500	24.5	21,800	22.4	49,580
Climate Change	3,670	26.3	9,360	30.9	17,300	25.7	18,600	19.1	48,930
TOTAL NUMBER of Publications	13,972	6.7	30,211	14.5	67,360	32.2	97,390	46.6	208,933

Accessed on 12th March, 2019 at 2pm

nutrition constituted 39% of total publications, while pedology/survey/land use planning and Soil physics/conservation/soil and water made up 26% and 29% respectively. Research published on soil microbiology/biotechnology and environment/pollution was very low, forming only 3% and 2.5% respectively, while climate change research was negligible at a paltry 0.3% (Figure 2)

The Nigerian Agricultural Journal (NAJ) was the longest in production of the three hard copy journals evaluated, and Figure 3 presents the cumulative percentage of scientific articles published according to sub-disciplines of soil science from 1980 – 2019 in NAJ.

Again, publications in the area of soil chemistry, fertility and plant nutrition was consistently higher than all other sub-disciplines , which peaked at 74% of total soil publications between 2000- 2009, reducing to 50% in the current decade. Research in this sub-discipline is mostly focused on direct assessment and application of soil productivity issues. Most sponsored projects and grants in soil science in Nigeria focused on this sub-discipline and hence the highest number of publications. There have been breakthroughs in the area of soil fertility, chemistry, and mineral nutrition in Nigeria within the span of these publications. Several researches have brought up fertilizer recommendations for individual crops based on specific ecologies in the country as opposed to the earlier practice of blanket fertilizer rates for crops. For example the work of Tarfa *et al*. (2017) where they developed fertilizer optimization tools for Nigeria was published by CABI.

Next to this discipline is pedology, survey and land use planning up until 1999 (Figure 3). Publications under pedology, survey and land use planning rose from less than 30% in the 80s to as high as 57% in the 90s (Figure 3). However, publications in this sub-discipline declined abruptly in the new millennium to date. This may probably be related to the use of antiquated research methodology and lose of interest in the sub-discipline by emerging young soil scientists. Certainly, the role of this sub-discipline in soil science cannot be over emphasized. Several research works and scientific publications that emanated from this sub-discipline of soil science have culminated into very useful soil resources in the country. Such resources include the development of the soil map of the whole country. Early works in this sub-discipline gave rise to the current description of the pedogenesis and geology of our soils. Soils of Nigeria were classified into different fertility status based on the assessment of their fertility indices. This sub-discipline has provided a detail survey of most agricultural and non-agricultural soils of Nigeria. This information is essential to planning irrespective of what the land is to be used for. While the current research in pedology is focused on pedometrics, use of GIS and remote sensing, the situation in Nigeria is still the

ancient pedological practice. This situation may be dangerous to the survival of soil science as a discipline in the near future.

Soil research in the field of soil microbiology and biotechnology is just emerging as a sub-discipline in Nigeria. The number of publications in the first three decades covered by this report is negligible. Only 3.3% of the total publication covered from 2010 to 2019 is in the area of soil microbiology and biotechnology (Figure 3). Research in this field is mainly focused now on capacity building in both human and facilities. New crop of PhD holders have been emerging and strains of rhizobium that can be commercialized have been identified and collected by researchers in this field.

Climate change research in Nigeria has been lagging behind in the past decades probably due to reduced effects of climate and greenhouse gases in Nigeria. During two decades from 1990 – 2009 the percentage publication on climate in Nigeria stands at zero while it rose the whopping 13.3% from 2010 to 2019 (Figure 3). This is an indication of glaring effects of climate change on agriculture and environment in Nigeria. Research in this area has been mostly based on simulations and modelling to combat the effect of climate on crop production and natural resources such as water.

Research publications in the area of soil physics, soil conservation and soil and water have been almost uniform across the decades from 1980 to 2019 save for 1990 – 1999 where the percent publication in this area stands at zero. The highest publication in this sub-discipline was observed between 2000 and 2009 with a percentage of 15.8 (Figure 3). Researchers in this field are shifting towards precision agriculture as well as simulation and modeling. This area is probably one the most neglected area of soil science in Nigeria as most people believed physical aspect of soil science is difficult.

Publications in the area of environmental pollution rose over the decades from 3.1% in 1980 – 1989 to 20% in 2010-2019 (Figure 3). This is of course due to rising population that is leading to generation of more waste, anthropogenic activities such as artisanal mining, use of pesticides and herbicides in agriculture and use of untreated wastewater from industries and municipalities. A lot still need to be done on pollution and its control in Nigeria. The country is yet to develop a guideline on acceptable level of heavy metals in soils, different crops, water and other environmental compartments. Researchers in Nigeria are currently using guideline for European countries and the America which may not be compatible with our situation in Nigeria. Researches have been conducted on effects of pollution on the lives and livelihood of affected communities. A case study is the lead poisoning that killed over 400 people in Zamfara. Several research works have been published in both local and international journals and the sources of the pollution identified and solutions proffered.

Comparative research focus as reported in local (text) and global (online) publications

A comparison of the articles published in the three text journals of NJSS, NJSER and NAJ with the wider documentation as captured online is shown in Figure 5. On a decade by decade basis, findings from online data show a better spread of research areas to involve all the categories, unlike those published in the three journals evaluated in which articles focused mainly on climate change, Environment /Pollution and soil chemistry/fertility and plant nutrition only.

However, research in soil physics, conservation/soil water was consistently lowest at less than 10% of all publications whether online or in hard copy text journals (Figure 5). This would suggest that greater attention should be paid to this important area of soil research.

Research in risk assessment as a result of pollution is also gaining ground in Nigeria. One major thing to be done that will make risk assessment in Nigeria complete is the development of risk assessment indices that is peculiar to the country. Such indices include; duration of exposure years, exposure frequency, body weight of the receptor, averaging time, average food ingestion rate for individuals, oral reference dose for individual contaminants and average daily crop consumption for individual crops by adults. All researches on this have been using indices developed by USEPA which may not be correct or adequate for the Nigerian scenario.

Publications so far assessed in soil science as a discipline in Nigeria is not very encouraging looking at our population and the enormous number of universities in the country. Nwachukwu and Nwachukwu (2016) reported Nigerian researchers in the field of soil science to be far below their global counterparts. With the legacies left by scientists like Rattan Lal, Jones, Wild, Kowal and Mokwunye, Nigeria's supposed to have gone far beyond where we are now. Some of these scientists worked for decades in Nigeria and left imprints of their work as scientific publications. The whole of this may be attributed to poor funding of research in the country and the lack of will power from the government and stakeholders in supporting basic science research in the country. Poor infrastructure is another major impediment to research in Nigeria. Several equipment and machines purchased at very exorbitant prices have broken down as a result of erratic power supply. Lack of access to sources of good quality publications by scientist, researchers and students is also a major problem.

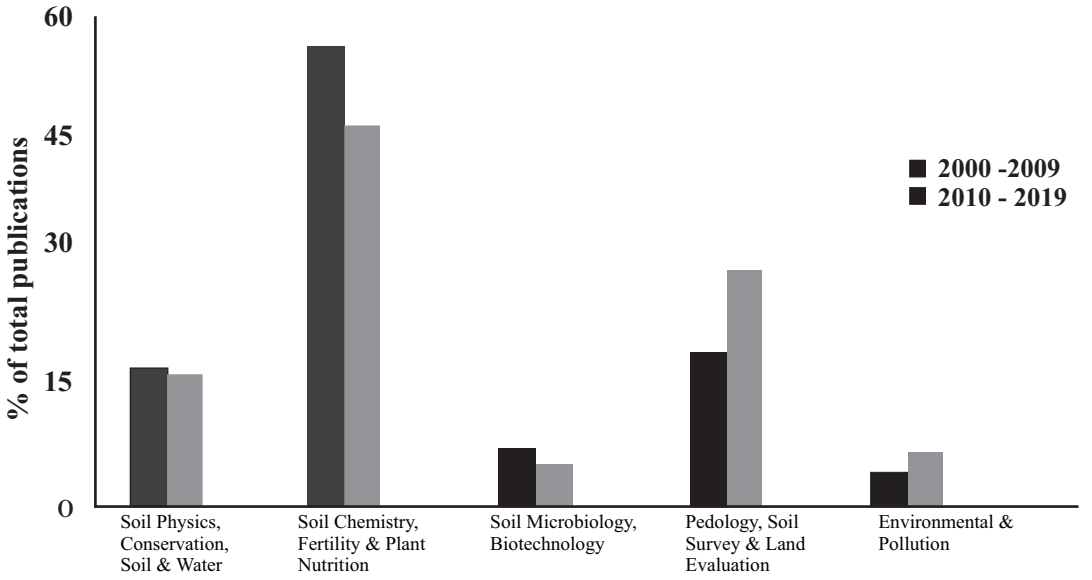


Figure 1. Soil research by sub-discipline in NJSS from 2000 – 2019

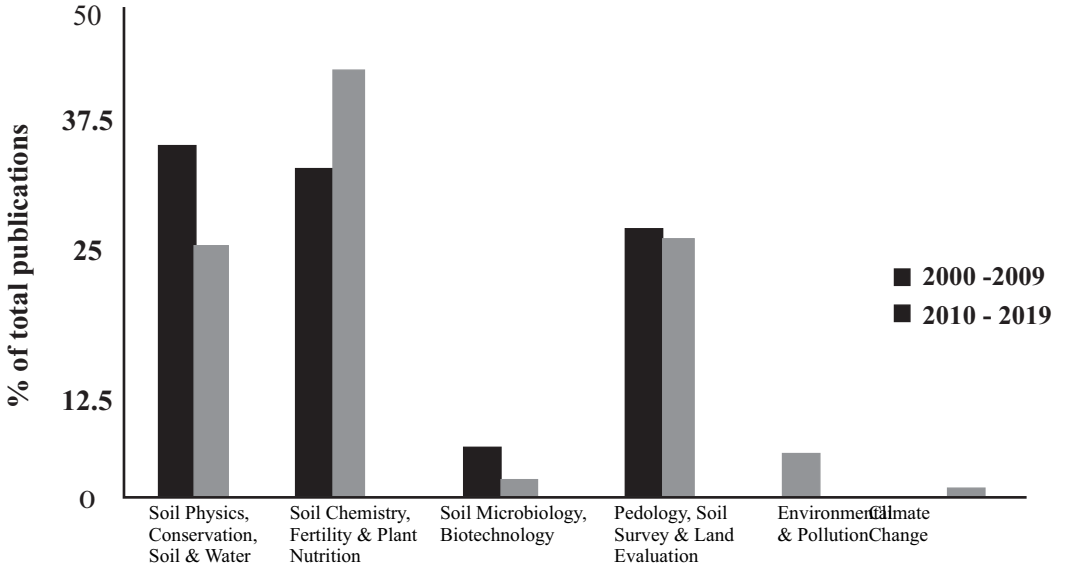


Figure 2. Soil research by sub discipline in NJSER from 2000 - 2019

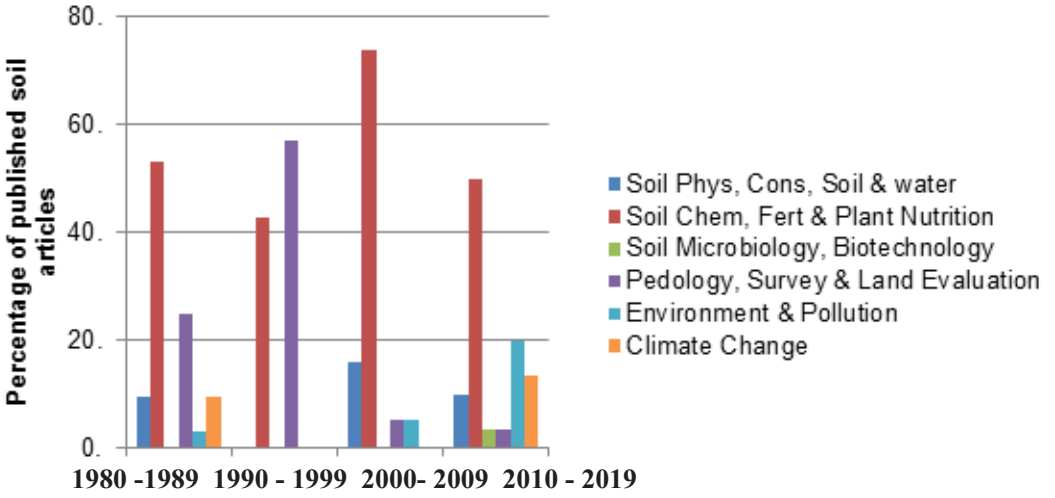


Figure 3. Research publications in soil science according to sub-disciplines in Nigeria from 1980 to 2019

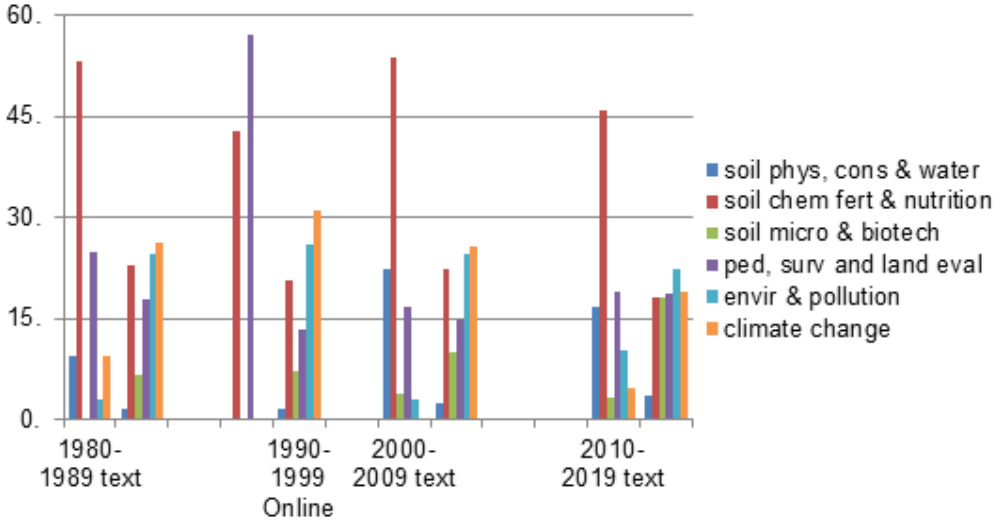


Figure 4. Disttribution of soil research papers according to authors' institutions in Nigeria from 1980 – 2019

Research productivity based on institution

In Nigeria, most publications are authored by University lecturers, researchers in research institutes and very few from lecturers from Colleges of Education and Polytechnics (Figure 4). On the average, 54% of research articles on soil science from 1989 to date were published by lecturers in Universities which was followed by Research Institutes with a percentage of 35.2.

Figure 5. A comparative overview of total soil research in Nigeria from all available sources

The least in rank are Colleges of Education with 1.1%. For the Universities, research publication was at its peak in the decade 1990-1999 with 71.4% and declined to 57.9% in the following decade and to 56.7% in the current decade. In the research institutes, it increased from 28.6% in 1990-1999 to 42.1 in following decade and decreased abruptly in 2010-2019 (Figure 4). This trend of decreasing number of publication can certainly be attributed to dearth of committed researchers and loss of interest due to poor funding, poor infrastructure, lack of zeal and commitment and very poor research, teaching and supervision conditions in the country. Many researchers have left the country as a result of these problems. Researches are not tailored to problem solving and hence publications in high quality journal cannot emanate from such researches. Lack of adequate laboratory equipment is killing the zeal of many researchers as well developed proposals might not be executed in our laboratories with outdated equipment.

Table 1: Institutions offering soil science in their curricula the world over

Africa	Asia	N. America	S. America	Europe	US	Oceania	Antarctica
14	20	5	7	11	75	11	0

Some Institutions in Nigeria with Soil Science curricula

1. Department of Agriculture, Delta State University, Asaba
2. Department of Soil Science, University of Maiduguri, Maiduguri
3. Department of Soil Science, Chukwuemeka Odumegwu Ojukwu University Uli
4. Department of Soil Science, Ambrose Alli University, Ekpoma
5. Department of Soil Science and Land Management, University of Benin, Benin City
6. Department of Soil Science and Land Management, Federal University of Agriculture, Abeokuta
7. Department of Soil Science and Land Resources Management, Obafemi Awolowo University, Ile-Ife
8. Department of Soil Science and Land Resources Management, University of Nigeria, Nsukka
9. Department of Soil Science and Meteorology, Michael Okpara University of Agriculture, Umudike
10. Department of Soil Science, Ahmadu Bello University, Zaria
11. Department of Soil Science and Land Resources, University of Ibadan, Ibadan
12. Department of Soil Science, University of Calabar, Calabar.
13. Department of Soil Science and Land Resources Management, University of Uyo, Uyo.
14. Department Of Crop, Soil And Pest Management, Federal University Of Technology, Akure
15. Soil Science Division, National Root Crops Research Institute Umudike,
16. Department of Soil Science Technology, Oyo State College of Agriculture and Technology, P. M. B. 10, Igboora,
17. Department of Soil Science and Environmental Management, Ebonyi State University, Abakaliki
18. Department of Agriculture, Lagos State Polytechnic, Epe, Lagos
19. Department of Soil and Land Management, Federal University of Technology, Minna
20. Federal University Oye Ekiti, Oye Ekiti
21. Federal University Kashere, Kashere
22. Federal University Dutse Ma, Dutse Ma
23. Federal University Dutse, Dutse
24. Federal University Gashua, Gashua
25. University of PortHarcourt, PortHarcourt
26. Uthmanu Dan Fodio University, Sokoto

Some Journals Publishing Soil Science Research in Nigeria

Nigerian Journal of Soil Science -

I. The Nigerian Journal of Soil Science publishes research works in all aspects of soil science and is a publication of the Soil science Society of Nigeria.
Nigerian Journal of Soil and Environmental Research

ii. - a publication of the Department of Soil Science, Faculty of Agriculture, Ahmadu Bello University, Zaria. It publishes research in all aspect of soil science and environment.

iii. Ife Journal of Agriculture - is a publication of the Faculty of Agriculture, Obafemi Awolowo University (OAU), Ile Ife. It publishes research results in all aspect of Agriculture

iv. Nigeria Journal of Agriculture and Forestry (NJAF). http://www myaau.com… Annual publication of all aspect of Agriculture and Forestry. Faculty of Agriculture, Ambrose Alli University, Ekpoma. fagricjournal.aauekpoma.edu.ng

v. Agro-Science, Faculty of Agriculture, University of Nigeria, Nsukka

vi. Moore Journal of Agricultural Research – is published by IAR&T, Ibadan, and publishes research works in all aspect of agriculture

vii. Samaru Journal of Soil Science – a publication of the Department of Soil Science is devoted to all aspect of soil science.

Trends in Research Publications by Institutions in Nigerian Based on Areas of Soil Science

Table 2 is a summary of publications by Institutions based on the responses by soil researchers in Nigeria to a questionnaire circulated in March 2019. Though this number may appear large, it is very far from expectation as many known soil researchers disappointedly did not respond. Publications in Genesis, Survey, Classification and Land Evaluation topped the list (≈ 29 %) closely followed by publications in the area of soil fertility (≈ 28 %) of the overall total. The least number of publications (≈ 4%) is in the area of soil biology and biochemistry. Many soil researchers appear to be moving their research interests to areas of environment probably in preference to soil chemistry, mineralogy, biology and biochemistry as shown by the distribution of number of publications (Table 2).

Future Challenges in Soil Science Research

Due to the complex nature of soil, its functions are numerous and soil scientists must leverage on these in expanding the scope of soil research in future. The functions have been summarized by Arnold (2006) as follows;

'resistance – an ability to maintain current conditions; residence time – the

capacity to store and release compounds; productivity – the capability for plant growth and yield; resilience – recovery from disturbance; responsiveness – the capacity for external enhancement; flexibility – the multiplicity of uses related to properties; and sustainability – a dynamic equilibrium of interactions".

The expectations of our soil scientists in future have been captured by Anderson (2006).

"In future, soil scientists must move beyond our many technical accomplishments, making soils more interesting, more alive and vital to us, our students, the larger science community, and the community broadly defined". However, Blum (2006) argued that in the future, two main trends will remain: In countries with food deficiency, soil science will mainly target soil fertility in its largest sense, as long as these deficits exist. Unfortunately, this threat is increasing in many countries in Africa, Asia and South and Central America. In contrast, in countries with sufficient food supply, soil science will increasingly target environmental and cultural issues, such as protection of the food chain against contamination, protection of ground water resources, protection of the air and of human health as well as protection of soil as a cultural and natural heritage, because clean food, clean water and a clean air are the basis of a healthy environment, guaranteeing a long life expectancy of people. Besides these two main trends, in industrial countries, other aspects will gain importance, such as soil science for archaeological dating, forensic soil science, and other applications of soil science to very specific social and economic demands.

From Table 2, the second highest number of publications is in area of soil fertility supporting the idea that soil researchers in Nigeria acknowledge the fact that there is food insufficiency in the country. Many researchers also acknowledge the roles of soils in environment taking cognizance of the number of publications in that area.

From summary of future challenges (Table 3), funding and equipment for research stand out prominently. The former was either ranked first or second as the most future challenge while equipment especially for laboratory analysis appeared as the second most important future challenge to soil science research in Nigeria.

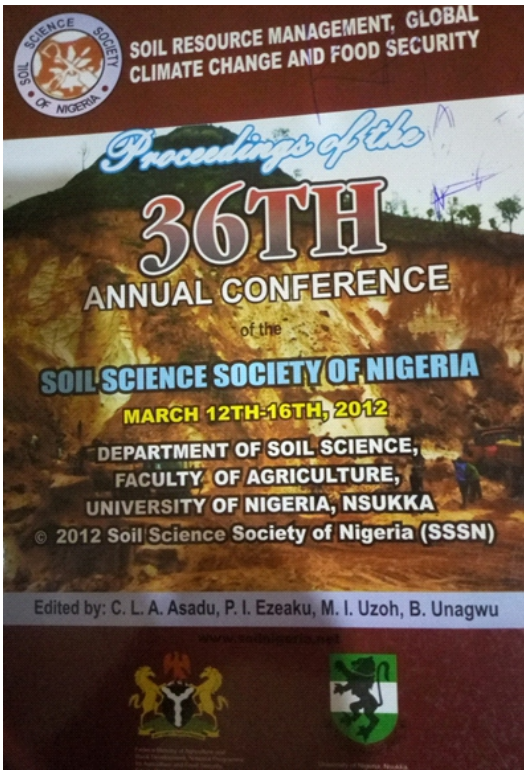
Table 2: Summary of responses on number of publications from all Institutions.

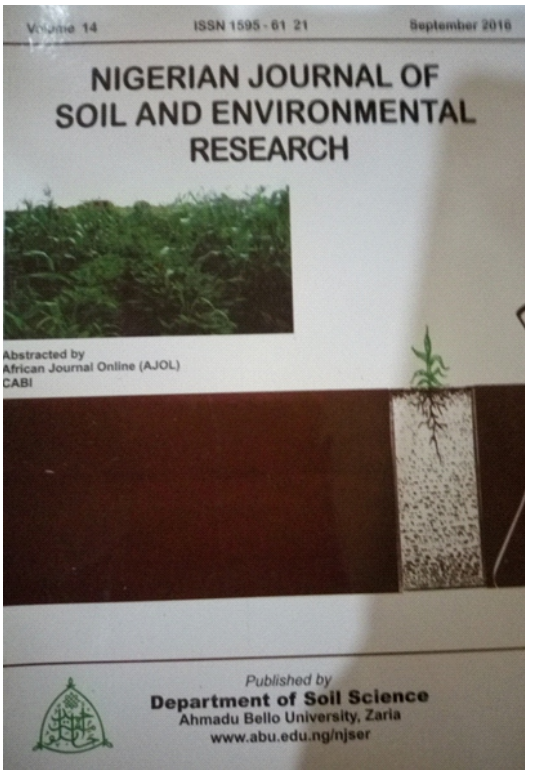
S/N	Name of Institute	Genesis Survey, Classification Land Evaluation	Physics Soil, Conservation	Fertility	Chemistry Mineralogy	Biology Biochemistry	Environment	Others (specify below)
1	International Institute for Agriculture, Ibadan	-	9	4	2	15	4	-
2	Micheal Opera University of Agriculture, Umudike	32	25	68	8	6	13	21
3	University of Nigeria, NSUKKA	69	27	80	5	4	32	2
4	University of Calabar	50	30	56	21	9	17	17
5	University of Ibadan	96	8	13	1	-	-	-
6	Bayero University, Kano	-	-	8	-	-	-	-
7	Obafemi Awolowo University, Ile-Ife	23	9	7	2	-	1	
8	University of Uyo, Uyo	2	4	18	24	2	5	4
9	Federal University of Agriculture, Abeokuta	5	15	4	1	-	-	-
10	Benson Idahosa University, Benin City	6	1	10	9	-	6	-
11	Enugu State University of Technology	10	20	15	15	10	10	5
12	Namdi Azikwe University, Awka	-	-	21	-	-	-	-
13	Ahmadu Bello University, Zaria	17	49	12	-	-	29	27
14	Federal University Gashua	4	6	-	-	-	-	-
15	Federal University Dutsin-Ma	2	2	8	2	-	7	-
16	College of Agriculture, Lafia	-	-	25	1	-	5	4
	Total	361	205	349	91	46	129	80
	% of Overall Total (1261)	28.6	16.2	27.7	7.2	3.6	10.2	6.3

Table 3: Summary of responses on Future Research challenges by Institution

Institution	First	Second	Third	Fourth	Fifth
IITA, Ibadan	Climate change & water shortage	Soil chemical, biological and physical degradation	Land grabs by large companies	Negative consequences of inappropriate mechanization	Slow structural change towards sustainable intensification
MOUA, Umudike	I. Absence of funding for soil research ii. Poor funding of research in Nigerian Universities by the government and private sectors iii. Lack of demand-driven soil science research in most Universities	I. Ignorance of the critical need for Land use planning ii. Difficulties in accessing funds earmarked for research due to unnecessary bureaucracy and high level of corruption in the country iii. Lack of equipment and materials for soil science research teaching, e.g. Munsell colour chart	I. Insecurity ii. Poor statistical background to cue into geostatistical analysis of data	I. Lack of good collaboration among institutions /research teams and individual researchers ii. Lack of experienced soil scientists in dissemination of soil-based innovation	I. Research findings not adequately extended to farmers, industries, government and their agencies as well as others it could benefit ii. Poor interest of the youths for soil science
UNN	I. Funding ii. Lack of Institutional support iii. Lack of Institutional support iv. Poor Funding	I. Laboratory equipment ii. Unsustainable finances iii. Inadequate number of Soil Science staff (both academic and non-academic) iv. Poor Laboratory facilities	I. Institutional collaboration ii. Poor Laboratory facility iii. Poor research facilities iv. Unconducive environment	I. Exchange programmes ii. Inadequate library/ computer facilities iii. Unskilled laboratory technicians iv. No incentive	I. Extension of research results ii. Lack of synergy/ networking among scientist iii. Negligence of Soil Science Research Reports in National Development iv. Poor policy framework
UniCal	I. Cost of mineralogical analysis ii. No research grant iii. Lack of X-ray machines iv. No good laboratory for analysis v. Soil awareness orientation in rural and national capacity is lacking	I. Contemporary research thrust ii. No modern equipment in the Laboratory iii. Lack of AAS iv. Creating attractive benefits for soil science graduates.	I. Research funding availability ii. Laboratory staff are not well-trained iii. No grant for research iv. Making Agric Science compulsory at Primary and Secondary institutions.	I. Collaboration not encouraged, single authorship encouraged ii. There are no standard laboratories	I. Lack of equipment ii. Institutional incentives for those making soil science their carrier is lacking
UI	Soil Degradation	Sustainable Soil Management	National Soil Classification System	Impact of Climate Change	Soil Evaluation for Multiple Cropping
BUK	Lack of standard laboratory services	Poor funding for research	Lack of implementation of research findings		
IAR&T (OAU)	Digital mapping and numerical classification	Soil correlation	Instrumentation for mineralogical studies	Integration of soil science to other field of studies like environment without losing the basic	Funding of soil research
UNIUYO	Resolving Soil Phosphorus Chemistry Constraints in Akwa Ibom State	Fertilizer Use: Quality Constraints in Crop Production	Getting Farmers to Obtain Optimum Yields in Crop Production	Waste Management and Soil/Water Quality	
FUA, Abeokuta	I. Climate change ii. Availability of the state-of-the art-equipment	I. Environmental pollution ii. Availability of functional laboratories	I. Soil erosion and degradation ii. Research grants for groundbreaking researches	I. Greenhouse emissions ii .Linking soil research output to industries and policy makers	
BIU, Benin City	Finance	Equipments	Chemicals	Laboratories	Communication
ESUT	Funding	Equipped laboratory	Manpower	Information accessibility	Lack of patronage

Institution	First	Second	Third	Fourth	Fifth
NAU, Awka	Lack of Modern Scientific Laboratory Equipment	Funding	In-Experienced Laboratory Technologist	Inter-agency collaboration	Poor student enrollment
ABU, Zaria	Creation of effective working groups of SSSN	Empowerment of working groups			
FU, Gushua	Funding	Laboratories to carry out soil analysis	Availability of data		
FU, Dutsin-Ma, Katsina	Increase soil erosion	Soil pollution	Decline soil security and productivity	Decrease soil management	Increase loss of soil organic matter
CA, Lafia	Inadequate functional soil science laboratory with modern scientific equipment				





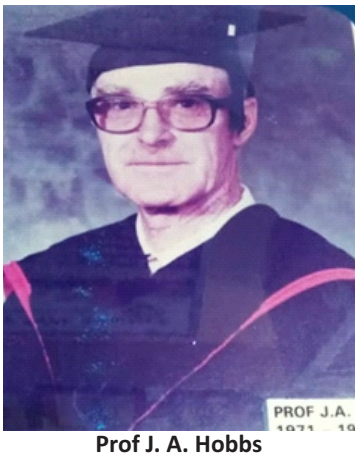
A Greenhouse for soil research

A typical undergraduate research Laboratory
at Ahmadu Bello University, Zaria

International Centre for Soil Research

A stand at one of the conference for sales of Society Publications

Faces of some researchERS in international research centres



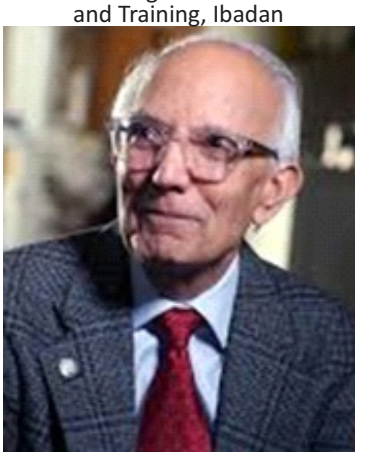
Prof J. A. Hobbs
First HOD, soil science Dept,
ABU, Zaria 1971-1972

Dr. B. T. Kang
International Institute for Tropical Agriculture, Ibadan

Prof. A. Singh
HOD, Soil science Dept,
ABU, Zaria 1976-1977

Dr. A. J. Smyth
Institute of Agricultural Research and Training, Ibadan

Dr Nteranya Saqinga
Current Director-General
IITA, Ibadan (2011-Date)



Prof Ratan Lal
A foremost Soil Scientist and
President IUSS 2014-2018

CHAPTER IV

STRATEGIC PARTNERSHIP WITH NATIONAL AND GLOBAL INSTITUTIONS IN SUSTAINABLE SOIL PRODUCTIVITY STUDIES

BY

[1]Ojuola, B. O., [2]Asawalam, D. O.,[3]Jibrin M. J. [4]Oshadia P., [5]Noma S. S.

[1]*Farm Technologist Research & Extension Initiatives, Moor Plantation, Ibadan.*

[2]*Department of Soil Science and Meteorology, Micheal Opara University of Agriculture, Umudike*

[3]*Department of Soil Science, Faculty of Agriculture, Bayero University, Kano.*

[4]*Department of Agricultural Lands & Climate Change Management Services, Fed. Min. of Agric & Ruaral Dev., Abuja.*

[5]*Department of Soil Science, Uthmanu Danfodiyo University, Sokoto.*

INTRODUCTION

Nigeria's developmental strides in the inventorization of the country's agricultural land resources have been enhanced by various contributions from the early days by United Kingdom via its agencies and Scientists as well international bodies such as the United Nations (FAO/UNESCO) the United States Department of Agriculture (USDA), Netherlands, amongst others.

These organisations have also actively supported and complemented efforts of the defunct regions (the West, East and North of Nigeria) in the execution of soil inventories in their locations.

Although most of their soils surveys were executed at explorations/ reconnaissance level, they were useful in illuminating the types and groups of soils, and their agricultural potentials. These were thereafter enhanced for specific purpose, semi-detailed levels.

At national level, the country witnessed giant strides, initially by regional governments (North, East and West) in evaluating soil resources for specific crops (Cocoa, Oil palm, Groundnut and Cotton) via the research arm of the Ministry of Agriculture which later transformed to Research Institute in their domain [IAR&T/ Western region, IAR Samaru Zaria (Northern Region.

This short treatise is to establish the role(s) of strategic partners with national and

global institutions in sustaining soil productivities studies in Nigeria. It also includes the efforts of non-governmental organization (NGOs) such as Bill and Melinda Gates Foundation; International companies such as NEDECO, efforts of various River Basin and Development Authorities as well as Federal Government through the Department of Agricultural Land Resources (FDALR) of the Ministry of Agriculture and Rural Development via the National Soil Survey Program.

In addition to various soils surveys, land use and assessment of degraded agricultural lands occasioned by acidity, salinity, oil pollution and mining activities were executed with the financial support from the Ecological Funds Office of the Federal Government of Nigeria.

SOIL SURVEY AND CHARACTERIZATION

Pre-Independence era

Prior to, and at independence (1960) Nigeria's main economic contributor to GDP was largely agrarian, with the focus on cultivation of cash crops such as Cocoa, Oil palm, Groundnut, Cotton, Rubber, Kola, etc and stable food crops such as maize, rice, yam, millet and cassava.

In efforts towards upscaling local production, various regional governments, through the research divisions of the Ministry of Agriculture, embarked on soil inventories targeted towards identification of suitable agricultural lands for Cocoa, in the West and Midwest, oil palm and rubber in the East and Midwest, groundnut and cotton in the Northern Regions.

To achieve this, the Western Region via its Research Division of the Ministry of Agriculture, conducted soil assessment for suitable areas for cocoa production [Smyth and Montgomery (1956)] led the team that pioneered these efforts. This was followed by the Eastern Regions for oil palm while the research division of Ministry of Agriculture transformed into Institute of Agricultural Research, Samaru Zaria. The IAR conducted reconnaissance/ exploratory survey for assessment of suitable agricultural lands for cotton Funtua/ Gusau in Northern Nigeria.

Of note was the role played, and the support in land resources assessment across the country by the Land Resources Division of the Ministry of Overseas Development (LRDODA).

The studies conducted at reconnaissance levels covered the following areas:-

- Soils of the Western State Savanna
- The Jema'a Platform
- North Central Nigeria
- Kano Plains
- Bauchi Plains
- Benue Trough
- Kamadugu - Yobe -Chad basin among others.

Although executed at exploratory levels, the reports identified areas of agricultural potentials and recommendations for appropriate land use/management system.

Federal Department of Agricultural Land Resources (FDALR)

Following repeated demands by the Soil Science Society of Nigeria, a department of Agricultural land Resources (FDALR) was created in the Federal Ministry of Agriculture and Natural Resources in 1979. The demand was informed by the need to have in the Ministry, a separate unit that helps government to develop policies and programmes to address soil related constraints to agricultural development. The first project handled by this department was the execution of the Reconnaissance soil survey of Nigeria; and it confirmed the necessity for its creation. In the wake of Climate Change and its potential impacts on virtually all spheres of the economy, the department was renamed Department of Agricultural Lands and Climate Change Management Services.

A major landmark achievement towards national soil inventorisation was the contribution of the FDALR in the National Soil Survey programme in the eighties. The map published at a scale of 1,650,000 covered the entire country, and has remained the reference point till date at the national level.

The United States, via the USDA, provided technical backstop, although at the final stage of its completion. The Netherlands government also played a major role in training and capacity building of staff of the FDALR.

Reconnaissance Soil Survey of Nigeria

After the Oil boom of the 1970s, Nigeria was faced with food shortages and resorted to massive importation of food which was not sustainable. Agricultural programmes developed to address this problem included Operation Feed the Nation (OFN) and Green Revolution (GR) which emphasized the use of soil and cultivation of more land to promote increased agricultural production. In 1979, the Government of the United States of America offered a technical assistance to the Federal Government of Nigeria to help in the production of a reconnaissance soil map of Nigeria. This project was informed by the dearth of soil data on which major farming operations were based. The project was aimed at characterizing the soils of the agriculturally viable areas of the country, to enable optimum utilization of each parcel of land for the production of crops it is best suited for. Field work started in 1980 and was completed in 1985. This effort led to the production of a reconnaissance soil survey map of Nigeria, complete with explanatory reports at a scale of 1: 250,000 in 1985. This was further developed between 1985 and 1990 to two levels of maps of 1: 650, 000 and 1: 1000,000 on Agro-ecological zone basis. The reports in four volumes and maps were published in 1990.

The project was a very successful collaboration between the Soil Science Society of Nigeria, Federal Department of Agricultural Land Resources and Federal Ministry of

Agriculture and Natural Resources. In the execution of the field work, soil scientists from across the country were pulled from Universities, Research Institutes, Ministry of Agriculture and their agencies, and formed into teams that were assigned to specific geographical areas. Thus, in this particular project, Nigeria fully appropriated the skills of her professionals under the umbrella of Soil Science Society of Nigeria (SSSN) to address a national challenge. The result was spectacular.

The reports and maps provide information on the types, occurrence and distribution of the different soils that are found on the land mass of Nigeria. The expectation of the Soil Science Society of Nigeria is that the nation should go beyond the reconnaissance scale to a detailed scale of mapping which will be more useful in addressing challenges of soil degradation, soil pollution and food production.

National Agricultural Land Development Authority (NALDA)

Between 1960 and 1980, several agricultural and rural development programmes were set up to boost the agricultural sector through the infusion of modern technologies. The River Basin Development Authorities engaged in large scale land clearing exercises, which resulted in massive land degradation. SSSN drew attention to the fragile nature of Nigeria's soils and the negative impacts of inappropriate land clearing techniques. As a result of the awareness created by SSSN on the benefits of appropriate land clearing methods, the FGN in 1991, created NALDA with the mandate to provide strategic support for land development in a manner that will ensure minimum soil and environmental degradation and promote appropriate and cost effective mechanization of agriculture, among others.

The objectives of NALDA were the provision of strategic support for land development of viable economic farm holdings in the country, the consolidation of scattered fragmented peasant farmers in order to encourage the evolution of economic size farm holdings, provision of income and employment opportunities for the rural people in order to raise rural incomes. Other objectives are expansion of productive capacity in agriculture so as to regain export capability in the traditional and non-traditional export crops through optimum utilisation of the nations abundant land/soil resources in a manner that will ensure minimum soil and environmental degradation and the promotion of appropriate and cost effective mechanisation of agriculture.

During the 8 years of NALDA operation/intervention in Nigeria many successes were experienced. More than 54,000 hectares of land were acquired within the first year of operation alone and 28,000 hectares cleared and developed. Out of the cleared and developed land about 15,000 hectares were cultivated out of which about 5,400 hectares planted to tree crops. As at January 2000 when NALDA was scrapped a total of 17,820 hectares were cultivated and the number of active participants in NALDA programme was 6,811 (Akinsola and Oladele, 2004).

The first and only executive Secretary NALDA was Prof G. Lonbim, a one time President of the SSSN.

National Fadama Development Project (NFDP)

Fadama soils are low-lying swamp areas consisting of fluvial deposits. Fadama also refers to seasonally flooded areas used for farming during the dry season. They are flood plains (wetlands) of recent alluvial deposits with a growing period of 150 days or more. Available information indicate that over four million hectares of Fadama land have been identified in Nigeria, out of which only 2.5 million hectares can be developed for small scale irrigation.

The management of wetland soils for Sustainable Agriculture and Environment was first discussed at the 1984 conference of SSSN in Port Harcourt. Based on the recommendation of the Soil Science Society of Nigeria and in recognition of the vast potentials of Fadama lands in the country, the government in 1992 approved the implementation of the National Fadama Development Project (NFDP) for their effective management, improved environmental quality, food security and poverty alleviation. The first phase of this project was executed in seven states from 1973 – 1999. The second phase was launched in 2004 and implemented in 18 states with 12 participating states supported by the International Development Agency while the other six states were supported by the African Development Bank for a period of six years (2004 – 2009). The fadama project is now in the third phase.

Wetland soils can support enormous fisheries resources, a wide spectrum of crops ranging from tree crops like Raphia palm, oil palm, to arable or industrial crops such as rice, sugar cane, banana, plantain, yam pineapple etc. Given that water and soil are the most critical factors in agriculture, if properly harnessed, Fadama soils offer enormous potential for all season crop production and aquaculture.

The Institute of Agricultural Research (IAR) Samaru Zaria via its Soil Survey Division and with the support of United Kingdom and Canada, executed various soil assessment projects across northern Nigeria, a few are worthy of mention here;

- Kano - Kadawa Irrigation Project
- Mokwa - Kainji - Kontagora (North Western Nigeria) project by Valetti *et al*
- The land capability survey prepared by the Niger dams resettlement authority (R.A.PULLAN and P.N. deleew (1964)
- Report on localities on the Manbilla Plateau with reference to cultivation of Coffee Arabica (W.A. Hope), 1966.

  Semi-detailed soil surveys were executed across the River Basins in the country – namely;

  Kano – River (by NEDDECO, a Dutch Company)

  Sokoto – Rima Basin (by Imprecit Bakolori),

Hadejia – Jamaare River Basin, Kainji Basin Irrigation Project (Malaysian International Co. Ltd) for Niger River Basin Authority. Other River Basin Authorities such as Ogun – Osun, Benin – Owena, Benue, Cross River, Niger Delta, Chad also executed various soil and land use surveys for irrigation purposes.

All the projects were funded by the Federal Government of Nigeria via the RBDAs.

Post National Soil Survey Programme Era (2000 – Date)

The National Soil Survey Programme resumed after almost two decades hiatus, with the resuscitation of national soil inventories, but with different approach. The paradigm shift involves the conduct of semi detailed (1:50,000) studies aimed at identifying suitable lands across specific crop value chain locations.

The objective is to provide detailed, up to date soil survey and fertility evaluation tailored to specific crops such as Cocoa, Cotton, Groundnut, Oil palm, Soyabean, Maize, Cassava and horticultural crops.

The studies were conducted across selected Local Government Areas (LGA) in the following states – Cocoa (Cross – River, Osun , Ondo), Oil palm (Abia, Ondo, Cross River), Maize (Kaduna, Niger), Cassava (Ogun, Abia, Kwara), Rice (FCT), Soyabean (Bauchi, Gombe), Horticultural crops (Plateau), Cotton (Kastina, Gombe), amongst others.

The studies produced digitalized maps with geo-references.

Although limited in scope due to funds constraints, the studies were detailed enough to provide useful information to would – be investors in the agricultural production sectors. Funds were provided solely by the FGN, via FMARD.

DEVELOPMENT OF NATIONAL SOIL INFORMATION SYSTEM AND PARTNERSHIP WITH DEVELOPMENTAL AGENCIES AND NGOs

In view of large volume of information on soils and land use studies carried out, the need for a National Soil Information System (NISIS) that will collate, digitize and assemble data became a necessity.

The information on the NISIS node is expected to provide accurate, real-time information in the Nations soil resources to end-users and stakeholders in the agro-industry, as well as serve as a node to the African Soil Information System (AFSIS).

Bill and Mellinda Gates Foundation has been playing a leading role and has implemented the programme in Ghana, Nigeria, Tanzania, Ethiopia and Kenya.

A 2 Days AFSIS/NSIS Stake Holders Workshop

The FAO through the Global Soil Partnership (GSP) is equally playing a key role towards the development of NISIS as well as continued participation in the conduct of soil fertility and productivity studies in Nigerian.

Other National bodies, such as the Ecological Funds Office have also provided financial back-stop in critical areas of amelioration of degraded agricultural lands occasioned by soil acidity, salinity in Niger, Edo, Lagos, Ondo, Kano States; Oil polluted such in the Niger Delta, and reclamation of mining sites in Plateau State.
The International Fertilizer Development Centre (IFDC) has offered support in the evaluation of soil fertilizer status of Nigerian soil especially in providing site crop – specific fertilizer recommendations. It has also supported fertilizer blending that meets specific crop and agro-ecological Zones of the country.

NIGERIA INSTITUTE OF SOIL SCIENCE

In furtherance to the strategic partnership between the society and the Federal Ministry of Agriculture and rural development, in 2011, the Soil Science Society of Nigeria (SSSN) submitted a draft bill for an act to establish the Nigeria Institute of Soil Science to the National Assembly after passing it through the rigorous scrutiny by the Federal Ministry of Justices, the Bill scaled through the first and second readings in the Senate from 2011-2013 and in November 2014, it was subjected to Senate Public Hearing which was highly successful.

Faces At The Public Presentation Of Niss Bill At The 8th National Assembly

After necessary corrections, a clean copy of the amended Bill was then placed before the Senate by the Committee on Agriculture for the third and final reading and subsequent concurrence by the House of Representative. Unfortunately, due to the disagreement between the National Assembly and the President over the constitutional amendment, this final stage of the journey of the bill in the National Assembly did not materialize. The bill was re-submitted to the 8th National Assembly in 2015. On June 2, 2016, another public hearing was organized by the Senate committee on Agriculture and Rural Development. The bill was passed by Senate on June 8, 2016 and by the House of Representatives on 27th October, 2016. On the 4th of January 2017, the National Assembly presented the bill for presidential assent and on the 3rd of February 2017, it was signed into law. The Governing Council of Nigeria Institute of Soil Science (NISS) was inaugurated on the 27th September 2018 by the Honourable Minister of Agriculture Chief Audu Ogbe OFR. Prof Ayo Ogunkunle is the pioneer President of the Council while Prof Victor O. Chude is the pioneer Registrar.

Members of the First Council of NISS

BILATERAL RELATIONSHIPS

The Soil Science Society of Nigeria has always sought for and maintained bilateral relationship with sister Societies and organisations both locally and internationally. It also maintained a healthy membership of the International Union of Soil Science (IUSS) and good working relationship with organisations such as FAO, IFDC etc.

Nigerian-Canadian Soil Project

NICANSOL is an acronym for the Soil Science Society of Nigeria – Canadian Society of Soil Science (SSSN – CSSS) Twining Project in Soil Science. The project originated from a discussion in Hamburg at the 1986 conference of the International Union of Soil Science, between Prof. A, G. Ojanuga (then Vice-President of Soil Science Society of Nigeria) and Dr. Dumanski of the Canadian Society of Soil Science, on possible collaborations between the two societies. In 1988, Dr. Dumanski and Mr. Schori attended the Soil Science conference at Minna at which discussions were finalized for the take-off of the project.

The objectives of the project were:

a. To assist Soil Science Society of Nigeria become better established and active as a national, professional agricultural institution.
b. To provide a forum for interchange among the professional interests of Soil Science Society of Nigeria members and between Nigeria and Canada.

c. To support Nigerian Soil Scientists who are actually involved in the internationally coordinated IBSRAM research projects with adequate laboratory, library and other facilities needed for the realization of their research goals.

A soil laboratory and NICANSOL library were set up at the University of Agriculture, Makurdi as part of the NICANSOL project with facilities provided by the Canadian sponsors. NICANSOL project was an integral part of the Agricultural Institute of Canada (AIC) International Twining Program which was funded by the Canadian Agency for International Development (CIDA). Within the five years of the project (1988 – 1992), NICANSOL project recorded significant achievements including the following:

a. Funding the publications of 1987 and 1988 proceedings of Soil Science Society of Nigeria Conference as well as the first edition of the monograph on "Wetland Soils of Nigeria".
b. Equipment of the Soil Science Society of Nigeria laboratory at University of Agriculture, Makurdi.
c. Book supplies and establishment of NICANSOL Library at University of Agriculture, Makurdi.
d. Funded exchange visits of Nigerian and Canadian soil scientists. Members of SSSN who participated in this exchange project included Prof. A. G. Ojanuga, Prof. W. O. Enwezor and Dr. U. Umoti.

International Year of Soils (2015) and Decade of Soils (2015 – 2025)

In 2013, SSSN entered into bilateral relationships on capacity building, information sharing, and technical backstopping with International Fertilizer Development Center, Alliance for Green Revolution, Tertiary Education Trust fund, FAO – led Global Soil Partnership and African Soil Information Service.

Through this relationship, FAO has supplied office equipment, research materials, and publications to SSSN. FAO has also provided fund to support SSSN activities during the International Year of Soils (IYS) and International Year of Pulses (IYP) as well as publications of SSSN between 2015 and 2018. Volume 22 (1 & 2) of Nigerian Journal of Soil Science was published with support from Tertiary Education Trust Fund (TETfund). Volume 23 of Nigerian Journal of Soil Science was published with support from Modibbo Adama University of Technology, Yola while Volume 24 of Nigerian Journal of Soil Science was published with support from Abubakar Tafawa Balewa University, Bauchi.

In recognition of the important role of soil as that which underpins our survival and prosperity on this earth, as well as the need to ensure its proper management, the 68th UN General Assembly declared 2015 as the International Year of Soils (IYS) with the theme 'Healthy Soils for a Healthy Life'.

Some SSSN delegates with Prof. Rattan Lal at WCSS, Jeju, Korea 2014.

The objectives of the IYS were:

- to create full awareness of civil society and decision makers about the fundamental roles of soils for human's life;
- to achieve full recognition of the prominent contributions of soils to food security, climate change adaptation and mitigation, essential ecosystem services, poverty alleviation and sustainable development;
- to promote effective policies and actions for the sustainable management and protection of soil resources;
- to sensitize decision-makers about the need for robust investment in sustainable soil management activities aiming at healthy soils for different land users and population groups;
- to advocate rapid enhancement of capacities and systems for soil information collection and monitoring at the national level.

Activities marking the celebration of the International Year of Soils (IYS) in Nigeria were flagged off at the Multipurpose Hall of Landmark University, Omo – Aran, on March 10, 2015. In his address at the flag off ceremony, the President of Soil Science Society of Nigeria, Prof. V. O. Chude charged all soil scientists to take good advantage of soil events to promote the importance of soil to our health, wellbeing and socioeconomic growth. He stressed that the International Year of Soils aims to be a platform for raising awareness of the importance of soils for food and nutrition security and essential eco-system functions all year round. Highlights of the celebration included the unveiling of the IYS logo, presentation of the special IYS T-shirt, display of soil monoliths and historical photographs of the activities of SSSN, as well as society publications, and a special session of the Fellows of SSSN.

The president of SSSN, Prof. V. O. Chude specially charged the Fellows of soil Science Society of Nigeria to play leading roles in creating awareness about the soil in their various geopolitical zones.

Nationwide Youth Seminar (Catch Them Young) on the importance of Sustainable Soil Management as part of the celebration of the International Year of Soils were held between 15th June and 30th June 2015 in the following institutions: Federal University of Technology Owerri (FUTO), University of Nigeria Nsukka, Moddibo Adama University Yola, Institute of Agricultural Research and Training (IAR&T) Ibadan, University of Calabar, Michael Okpara University of Agriculture, Umudike, Ahmadu Bello University, Zaria, and Nasarawa State University, Lafia. A memorandum of understanding (MoU) between the Food and Agriculture Organisation (FAO) of the United Nations and SSSN enabled the Society organise the one day training workshop for youths in senior secondary school and students of agriculture in tertiary institutions in each of the six geopolitical zones. Some photographs of the Seminars are shown below.

Soil Evangelisation

As part of the activities marking the International Year of Soils, "Soil Evangelization" was created at Michael Opara University of Agriculture Umudike as a new vision and soil re-birth to increase our passion for sustainable soils use and management. This Soil Evangelization group is the first of its kind in the history of Nigerian Universities and members were conspicuously visible in the arena with their crested T-shirts and face caps.

Soil Evangelization group, MOUAU.

The 68th UN General Assembly declared 2016 the International Year of Pulses (IYP). The specific objectives of IYP 2016 were to:

1. Raise awareness about the important role of pulses in sustainable food production and healthy diets and their contribution to food security and nutrition.

2. Promote the value and utilization of pulses throughout the food system, their benefits for soil fertility and Climate Change and for combating malnutrition.

3. Encourage connection through the food chain to further global production of pulses, foster enhanced research, better utilized crop rotation and address the challenges in the trade of pulses.

The Soil Science Society of Nigeria celebrated the Year with activities in different institutions across the country. Report of the celebrations was published in SSSN Newsletter.

CONCLUSION

From modest, but significant efforts made in the fifties to current initiatives in the inventorisation of the nations agricultural land resources, the country has made remarkable progress that needs to be sustained.

The current trends in the conduct of soil resources assessment require collaboration and partnership by International agencies and organizations, non – governmental organizations, and support from the private sector, especially in the agro-industry. Other countries such as Ethiopia, Kenya and Ghana that were at par with Nigeria in the 60's and 70's have made significant efforts in harnessing their soil resources and attained food security in their countries. Nigeria, with its huge human resources (Soil Scientists, and environmentalists) can do more, while financial contributions and efforts of the Federal and States Government should be upscaled to enable the objectives of inventorising the nations agricultural lands be met. This will encourage other multi-national organizations and agencies to offer the needed support and partnership in ensuring food security in the country.

Faces At The Yearly International Year of Soils Celebrations

CHAPTER V

ANNUAL COMMUNIQUES FROM SOIL SCIENCE SOCIETY OF NIGERIA MEETINGS: IMPACT ON SOIL USE AND AGRICULTURAL POLICY

BY

Okusami, T. A.

Department of Soil Science and Land Resources Management,
Faculty of Agriculture and life Sciences.
Federal University Wukari.
Taraba State.

INTRODUCTION

The rationale behind this inventory exercise - RESOLUTIONS associated with COMMUNIQUES of Annual Meetings of the Soil Science Society of Nigeria [SSSN] – is to assess their significance towards the development of tangible advisory ideas and their utilizations by the various units of government especially at the Federal level. The Federal Ministry of Agriculture and Rural Development hosts the Department that oversees the inventory and utilization potential of the soil resources of Nigeria. Recent awareness hinged on research and management of the soil resources of Nigeria has made it mandatory that the Soil Science Society of Nigeria always develops a tripartite write-up [Preamble / observations / resolutions] at the end of each annual meeting. The records available indicate that this must have been going on [presumably] since the inauguration of the Society which turns fifty this year 2019 [i.e,, 1969 – 2019].

The Preamble dwells on the general administration of the annual meeting while the observations focus on the technical matters associates with deliberations at the plenary and oral/poster [- the later not very common yet] presentations.

The third tripod titled RESOLUTIONS is normally usually directed at the different levels of governance in Nigeria [Federal, State and Local Governments]. The objective of this contribution is to evaluate if these resolutions have had any response from all stakeholders especially at the Federal Government level.

RESOLUTIONS

Table 1 contains the Resolutions extracted from the communiqués that have emanated from the Annual Meetings since the inauguration and inception of the

SSSN until the last annual conference held at Ibadan in Oyo State. The compilation is not comprehensive but these are the readily retrievable ones. This in itself is a deficiency. Few telephone interviews were conducted to find out from the supposedly recipients of the distributed annual communiqués. Ideally, visits to some of these recipients should have been through the administration of questionnaires. The shortness of time and the unavailability of funds limited these possibilities.

TABLE 1. RESOLUTIONS [FROM COMMUNIQUÉS] OF SSSN ANNUAL MEETINGS ASSEMBLED FOR 50TH [1969-2019] ANNIVERSARY.

YEAR	RESOLUTIONS	FREQUENCY
2001 [27th] @ CALABAR	**THEME: MANAGEMENT OF WETLAND SOILS FOR SUSTAINABLE AGRICULTURE AND ENVIRONMENT**	
	1. That the FG of Nigeria should as a matter of urgency commission detailed studies, through its agencies with collaboration of soil scientists from the Research Institute and Universities on sustainable utilisation of wetlands.	a
	2. That the states and Federal Government should increase budgetary allocation to support research and development to ensure the rapid transformation of Nigeria's agriculture.	b
	3. That the Federal Government as a matter of priority should establish a national Institute for soil Research with centres in each of the six geo-political zones of the country so that the multifarious soil problems facing the country could be addressed in a holistic and concerted manner.	c
2004 [29th] @ Abeokuta	**THEME: MANAGING SOIL RESOURCES FOR FOOD SECURITY AND SUSTAINABLE ENVIRONMENT**	
	1. Nigerian soils should be surveyed at detailed levels beyond existing reconnaissance survey.	ax2
	2. A unified soil testing programmes should be established at federal, state and local Government levels as a basis for efficient use of fertilizer and sustainable environment management.	d
	3. Nigerian soil scientists should be involved in all agricultural efforts from national resources conservation point of view.	e
	4. Government, as a matter of urgency, should enact laws on fertilizer adulteration in Nigeria.	f
	5. Soil scientists should be involved in the provision of services for curtailing environmental degradation.	g
	6. A National Soil Research Institute should be established to address	cx2

YEAR	RESOLUTIONS	FREQUENCY
2007 [31st] @ Zaria	**THEME: SOIL AND WATER MANAGEMENT FOR POVERTY ALLEVIATION AND SUSTAINABLE ENVIRONMENT**	
	1. That the FG should speed-up work in the production of soil maps at detailed level beyond the existing reconnaissance survey for use by Nigerian farmers.	ax3
	2. The Nigerian soil scientists should be involved, as a body, in the planning and execution of all relevant agricultural projects undertaken to alleviate poverty and promote food security in Nigeria.	e x2
	3. That all tiers of Government as a matter of urgency, should provide adequate funds to ADPs, Research Institutes and Universities for the training and re-training of agricultural extension workers with the view of extending sustainable soil management strategies to farmers and other land users.	h
	4. A fertilizer regulatory framework is long over-due and should come on stream without further delay.	d x 2
	5. Legislation against mismanagement of soil and other environmental resources should be put in place by the Federal Government	f x 2
	6. The FG should enact laws that would enforce good quality control system towards sustainable agriculture.	f x 3
	7. Efforts should be made to sustain the on-going soil erosion control projects embarked upon by the FG agencies like the River Basin and Rural Development Authorities. There is also the need to ensure monitoring of soil and water qualities at the project sites in order to control soil degradation early enough.	i c x 3
	8. There is the need for the establishment of a National Soil Research Institute by the FMARD to address all soil related issues with a view to promoting sustainable agriculture in the country.	
2008 [32nd] @ Yola	**THEME: SOIL AND WATER RESOURCES MANAGEMENT FOR SUSTAINABLE ENVIRONMENT AND ECONOMIC EMPOWERMENT**	a x 4
	1. That the Government should expedite action on the production of soil maps at detailed scales beyond the existing reconnaissance survey maps currently being used for service to farmers and other land users. The establishment of a Nigerian Soil Information System (NIGSIS) as a tool for overall development planning is long overdue.	c x 4

YEAR	RESOLUTIONS	FREQUENCY
	2. That Government should as a matter of urgency, set up the machinery for the establishment of a Soil Research Institute to address all land management problems holistically on a national scale.	
	3. That all tiers of Government, using the Public-Private Partnership Approach, should establish organic based fertilizer plants to complement inorganic fertilizer in order to improve soil fertility, ensure balanced plant nutrition and sound environmental management.	d x 3
	4. That Government should extend the on-going 'Green Wall Sahara Nigeria" programme to the nearby States in the NE, NW and NC where there is over dependence on fuel wood for domestic use.	j
	5. That the Soil Science Society of Nigeria should be involved in the planning and execution of soil related agricultural projects undertaken to alleviate poverty and ensure food security in Nigeria which is one of the seven-point Agenda of the Present Administration.	g x 2
2009 [33rd] @ ADO-EKITI	6. That Government should consider the establishment of a National Commission for Bio-Fuel.	k
	THEME: MANAGEMENT OF NIGERIAN SOIL RESOURCES FOR ENHANCED AGRICULTURAL PRODUCTIVITY.	l
	1. There is the need for Government to expedite action on the actualization of the proposed Nigerian Soil Information System (NSIS).	
	2. Government should, as a matter of urgency, set up machinery for the establishment of a National Soil Research Institute to holistically address the soil resources management problems of the country as well as manage its soil data base.	c x 4
	3. As a step towards ensuring food security, the three tiers of Government should embark on a progressive production of a Soil Map of Nigeria at a more detailed scale.	a x 5
	4. Government should increase funding for research and studies on climate change issues and facilitate collaboration between Government agencies like Nigerian Meteorological Agency (NIMET), Universities and Research Institutes.	b x 2
	5. Urgent action is needed to arrest the enormous destruction of land and property resulting from gully erosion and desertification in the States.	i x 2

YEAR	RESOLUTIONS	FREQUENCY
	6. Government should consider urgency and critical the need to upgrade soil research laboratories in Research Institutes and Universities with state-of-the art equipment to facilitate research and capacity building.	m
	7. The Soil Science Society of Nigeria has the expertise and is willing to continue to partner with Government in addressing these issues.	g x 3
2010 [34th] @ IBADAN	**THEME: EMERGING CHALLENGES TO SOIL RESOURCES IN TIMES OF GLOBAL CLIMATE CHANGE AND FOOD CRISES**	
	1. That Government should heed the incessant call to establish a National Soil Research Institute to holistically address the soil resources management problems of the country.	c x 5
	2. The need to expedite action on the actualization of the proposed Nigerian Soil Information System (NSIS) has become more urgent with the varied impacts of climate change and the attendant threats to the food security of the nation's teaming population.	l x 2
	3. As a step towards ensuring sustained food security, the national soil survey project should commence without further delay; state and local Governments should buy into the project to ensure progressive production of Soil Maps of Nigeria at detailed and intensive scales.	a x 5
	4. Government should, as a basic response to emerging challenges, fund research on climate change issues so as to develop adaptation strategies to the impacts of climate change. The Soil Science Society of Nigeria, the Federal Ministry of Environment and the Federal Ministry of Agriculture and Water Resources should collaborate with other stakeholders in addressing the challenges of climate change.	b x 3
	5. Soil Science Society of Nigeria hereby reiterates its call for urgent action to arrest the enormous destruction of land and property resulting from gully erosion and desertification in the States.	i x 3
	6. Government should consider as urgent and critical the need to upgrade soil research laboratories in Research Institutes, Universities and Government Agencies	m x 2

YEAR	RESOLUTIONS	FREQUENCY
2011 [35th] @ MINNA	with state-of-the art equipment to facilitate research and capacity building aimed at meeting the present and emerging challenges on the nation's soil resources.	
	7. The Society calls the attention of all tiers of Government to institute with urgency scholarships for accelerated capacity building and training of soil scientists to the PhD level in the various endangered disciplines of soil science including pedology, soil chemistry, soil mineralogy, soil physics, soil testing/fertility evaluation and soil microbiology.	n
	THEME: SOIL RESOURCES MANAGEMENT, GLOBAL CLIMATE CHANGE AND FOOD SECURITY	
	1. There is the need for Government to establish more weather stations in strategic locations across the country to collect enough climatic information for accurate prediction of weather conditions for proper planning and mitigation of climate change impacts.	j x 2
	2. As a step towards ensuring proper soil management and food security, Government at all levels should promote conservation farming and use of organo-mineral fertilizers in nutrient management.	d x 4
	3. There is the need for timely and adequate provision of relevant inputs, especially organic and inorganic fertilizers to ensure increase crop yields and sustainable soil productivity.	d x 5
	4. The Society reiterates her call on Government to increase funding for research and outreaches on climate change issues and facilitate collaboration between Government agencies like Federal Ministry of Environment, Nigerian Meteorological Agency (NIMET), Universities, Research and Extension Institutes, and National and International NGOs.	j x 3
2012 [36TH] @ NSUKKA	**THEME: CLIMATE CHANGE, SOIL MANAGEMENT ALTERNATIVES AND SUSTAINABLE FOOD PRODUCTION**	l x 3
	1. To promote soil management an agro-technology transfer that will successfully drive the agricultural transformation agenda, Government is requested to expedite action on the	

YEAR	RESOLUTIONS	FREQUENCY
	actualization of the proposed Nigerian Soil Information System (NSIS) as a component part of the African Soil Information System (AFSIS).	
	2. Urgent action is needed to arrest the enormous destruction of land resources resulting from Climate Change related land degradation such as gully erosion and desertification.	i x 4
	3. Government should consider as a matter of urgency the critical need to upgrade soil research laboratories in Research Institutes and Universities with state-of-the art equipment to facilitate research and capacity building for soil improvement.	m x 3
	4. Government should urgently consider the approval of the Nigerian Soil Science Institute bill to holistically address the soil resources management problems of the country as well as manage its soil data base.	o
	5. There is the need for pro-active actions on carbon sequestration and trading through research and development which can be achieved through appropriate use of soil organic matter and promotion of soil building organisms.	j x 4
	6. There is the need for timely and adequate provision of relevant inputs such as organic and inorganic fertilizers, especially micronutrients, to ensure increased crop yields and sustainable soil productivity.	d x 6
	7. The Society reiterates her call on Government to increase funding for research and outreaches on Climate Change issues and facilitate collaboration between Government agencies like Federal Ministry of Environment, Nigerian Meteorological Agency (NIMET), Universities, Research and Extension Institutes and National and International NGOs.	j x 5
2013 [37TH] @ LAFIA	**THEME: SOIL SCIENCE, ENVIRONMENTAL MANAGEMENT AND FOOD SECURITY**	a x 7
	1. The Federal Ministry of Agriculture and Rural Development should, as a matter of urgency resuscitate the National Soil Survey Programme with the view to providing quality data for proper planning and utilization of the nation's soil resources. The Soil Science Society of Nigeria has the expertise and is willing to partner with Government in this regard.	

YEAR	RESOLUTIONS	FREQUENCY
	2. There is the urgent need for the National Assembly to expedite action on the Nigerian Soil Science Institute bill (currently before the Assembly) that will holistically address the soil resources and crop nutrition management problems as well as the environmental challenges of the country.	o x 2
	3. Government should consider urgently the critical need to upgrade the soil research laboratories in Research Institutes, Colleges of Agriculture and Universities with state-of-the art equipment to facilitate capacity building and enhance soil, crop nutrient and environmental quality assessment and monitoring.	m x 4
	4. As a step towards ensuring food security and environmental integrity, and also in line with the current global trends in Information Technology, government is requested to expedite action on the actualization of the National Soil survey Programme, a crucial data base for the Nigerian Soil Information Service (NSIS) which in turn is a component part of the African Soil Information Service (AfSIS). This re-emphasizes the need for SSSN to be fully involved in the execution of the National Soil Survey Programme.	l x 4
2014[38TH] @ UYO	**THEME- NIGERIAN AGRICULTURAL TRANSFORMATION AGENDA: SOIL AS KEY TO NATIONAL DEVELOPMENT**	
	1. Commends the Federal Government of Nigeria for the establishment of Climate Change desks in all Ministries, Departments and Agencies and reiterates her call on Government to further facilitate involvement of Soil Scientists in cognate national infrastructure development and increase funding for research on soils and land resources of Nigeria and for collaboration with other National and international agencies;	j x 6
	2. Commends the Akwa Ibom State Government for its commitment in tackling gully erosion as typified by the massive erosion control project along Dominic Utuk Avenue and others;	i x 5
	3. Requests the Federal Government of Nigeria to urgently consider the approval of the Nigerian Soil Science Institute bill to holistically address the Soil and Land resources management problems of the country, advance the education, science, technology and the art of Soil Science, promote soil quality management, and enhance agricultural production and environmental integrity in the country.	o x 3

YEAR	RESOLUTIONS	FREQUENCY
	4. Requests the Federal Government of Nigeria to urgently formulate a national policy on soil and land resources use and management to provide the legal framework for sustenance of life, and sustainable use of soil and land resources for overall national growth and development	f x 4
	5. Implores the Federal Government of Nigeria to drive further the principles and practices of detailed soil resources survey, land evaluation, land use planning, sustainable soil conservation and management to successfully achieve the noble objectives of the Agricultural Transformation Agenda.	a x 8
	6. Requests the Federal Government of Nigeria to facilitate the promotion of soil management and agro-technology transfer for value addition to the on-going Nigerian Soil Information System (NSIS) and the African Soil Information System (AfSIS) collaboration.	1 x 5
	7. Requests the Federal Government of Nigeria to compel the West African Examinations Council (WAEC) and National Examinations Council (NECO) to re-instate Agricultural Science as a compulsory subject in their examinations and encourage the study agriculture in higher institutions of learning by offering bursaries, loans and scholarships to undergraduate and postgraduate students.	
	8. Urges that Governments at all levels should engage the Soil Science Society of Nigeria and her members in development matters/projects involving land take and exploitation, (construction on land, gully erosion control projects, landfills, environmental beautification projects, housing estates, industrial parks, rails, road and habour development projects, etc)	
2015 [39TH] @ OMU-ARAN	**THEME: MANAGING NIGERIAN SOILS FOR FOOD SECURITY, CLIMATE CHANGE ADAPTATION AND MITIGATION**	
	1. To celebrate the International Year of Soils 2015 in Nigeria in accordance with the MoU signed with the FAO Regional Office Accra, Ghana and with additional support from the International Union of Soil Science.	q
	2. That all tiers of the government should continue to support both quality assurance and quality control in the area of Agricultural Revolution, including the Agricultural Transformation Agenda of the Federal Government, and enticing young students to pursue careers in Soil Science.	p x 2

YEAR	RESOLUTIONS	FREQUENCY
	3. Requests all land users to adopt policies and protocols including climate smart-agriculture aimed at halting and reversing all forms of land degradation.	i x 6
	4. Urges governments to upscale grass-root campaign on climate change and its consequences, preparatory to the adoption of mitigation measures.	j x 7
	5. Commends the Federal Ministry of Agriculture and Rural Development for Procuring 100 units of SoilDoc – a revolutionary technology for testing soil health for extension programme, which is a critical element of the Agricultural Transformation Agenda (ATA). This intervention is in tandem with soil extension activities of the Society. The Society therefore welcomes the invitation of the Honourable Minister of Agriculture and Rural Development to participate in the implementation of the African Soil Information Service Phase 2 and the up-scaling of the SoilDoc projects in Nigeria.	e x 6
	6. Requests the three tiers of government to support all forms of gender mainstreaming in climate change and extension as well as in the generation of sex desegregated data on access to agricultural lands and input. There is also the need to enact policies that will protect small holder farmers who are predominantly women.	f x 5
	7. To support strategies for achieving agricultural resilience in Nigeria which requires innovative technologies, policies and programmes, provision of agro-meteorological services, early warning mechanisms for disasters, changes in agricultural practices, agricultural diversification, agricultural water management, risk management and agricultural insurance, secured land tenure rights, strategic financial market support, agricultural market development, and provision of extension services.	
	8. Commends the efforts of the National Assembly in the steps so far taken in the process for the approval of the Nigerian Institute of Soil Science (NISS) bill to regulate the practice of the profession of Soil Science and promote the efficient and sustainable management of Soils in Nigeria for Food Security, Climate Change, adaptation and mitigation.	

YEAR	RESOLUTIONS	FREQUENCY
2016 [40TH] @ CALABAR	**THEME-**	
	1. That the NUC, National Board for Technical Education (NBTE), and Universal Basic Education Commission (UBEC) should work with the Society to review the existing basic soil science curriculum to reflect modern soil use challenges and encourage subscription into the study of agriculture, particularly soil science as also recommended by the **Vienna Soil Declaration.**	p x 2
	2. That there is the need for Nigeria to establish a National Soil Policy and Institute of Soil Science that will regulate the use, conservation and management of the nation's soil resources, as acknowledged by the Hon. Minister of Agriculture and Rural Development in his keynote address.	o x 4
	3. That as a means of checking accelerated soil /land erosion and degradation, soil scientists should be actively involved in the design and construction of all soil/land based projects to ensure that appropriate measure are adopted to avoid catastrophic erosion problems.	g x 5
	4. That there is increasing need to conserve the nation's soils and reclaim those that have been degraded physically, chemically and biologically, through the adoption of suitable technologies tailored towards sustainable soil/land conservation and management, and climate change adaptation and mitigation.	I x 7
	5. That government should initiate programmes to promote national awareness about soil/land use, conservation and management in collaboration with the society especially through the establishment of the Nigerian Institute of Soil Science.	lN x 2
	6. That the Society commends the efforts of the National Assembly in the steps so far taken in the process for the approval of the Nigerian Institute of Soil Science (NISS) bill, to holistically address the soil and land resources management problems of the country, and also request the National Assembly to kindly expedite action on the passage of the same bill into law.	lN x 3
	7. Urges NIMET to upscale grass-root campaign on climate change and its consequences, preparatory to the adoption of mitigation measures.	j x 8
	8. Appeals to the three tiers of government to support all forms of gender mainstreaming in climate change and extension as well as in the generation of sex desegregated	f x 7

YEAR	RESOLUTIONS	FREQUENCY
	data on access to agricultural lands and input. There is also the need to enact policies that will protect small holder farmers who are predominantly women.	
	9. That climate benefits of agricultural sector interventions can be enhanced if vulnerable areas (e.g. coastal zones and the arid northern areas) are considered for targeting of specific activities.	
2017[41ST] @ BAUCHI	**THEME: LAND DEGRADATION, SUSTAINABLE SOIL MANAGEMENT, FOOD AND NUTRITION SECURITY.**	
	1. That the Society thanks Mr. President for signing into law the NISS Bill and remains grateful to the National Assembly in timely expediting the passage of the bill.	lN x 4
	2. That the National Executive Committee of the Soil Science Society of Nigeria should continue to pursue the final gazetting of the Act establishing **NISS.**	
	3. Appeals to Federal Government to expedite the gazetting of the NISS Act and facilitate the putting up of necessary structure for the take-off of the Institute.	lN x 5
	4. That there is need for re-afforestation programme intensification in Arid and Savanna zones of Nigeria.	lN x 6
	5. That the NUC, National Board for Technical Education (NBTE), and Universal Basic Education Commission (UBEC) should work with the society to review the existing basic Soil Science curriculum to reflect modern soil use challenges and encourage subscription into the study of Soil Science.	j x 9
	6. That there is the need for Nigeria to establish a National Soil Policy working with NISS to regulate the use, conservation and management of the nation's soil resources, as acknowledged by Senator Heineken Lokpobiri (OFR), the Honorable minister of State for Agriculture.	p x 3
	7. That as a means of checking accelerated soil/land degradation, Soil Scientists should be actively involved in the design and construction of all soil/land based projects to ensure that appropriate measures are adopted to avoid catastrophic land degradation.	f x 9
	8. That there is increasing need to conserve the nation's soils and reclaim those that have been degraded physically, chemically and biologically through the adoption of suitable technologies tailored towards sustainable soil/land	g x 6

YEAR	RESOLUTIONS	FREQUENCY
	conservation and management, and climate change adaptation and mitigation as well as biodiversity.	
	9. Urges Nigeria Metrological Agency (NIMET) to upscale grass-root campaign on climate change and its consequences, preparatory to the adoption of mitigation measures.	g x 7
	10. Appeals to the three tiers of government to support all forms of gender main-streaming in climate change and extension as well as in the generation of sex disintegrated data on access to agriculture lands and input. There is also the need to enact policies that will protect small-holder farmers who are predominantly women.	j x 10
	11. That benefits of agricultural sector interventions can be enhanced if vulnerable areas such as coastal zones and the arid northern areas are considered for targeting of specific activities.	j x 11
	12. Urges government to ensure prompt delivery and availability of fertilizers to farmers early enough in the season. The Federal government should continue to provide the necessary support for the state governments that are yet to resuscitate or establish fertilizer blending plants.	d x 7
	13. That fertilizer blends should be site/region specific and should include Sulphur and zinc nutrient elements.	d x 8
	14. That the tiers of government: Federal, State and Local governments should involve soil scientists in the implementation of the government diversification programme especially governments intent to engage the River Basin Development Authorities to expand irrigation facilities and water activities.	r
2018 [42ND] @ IBADAN	**THEME: SUSTAINABLE MANAGEMENT OF SOIL AND WATER RESOURCES FOR FOOD SECURITY, CLIMATE CHANGE ADAPTATION AND MITIGATION**	
	1. That fertilizer blends should be crop and site specific, and should include secondary and micronutrient elements.	d x 9
	2. Detailed soil surveys and land evaluation should be conducted as a basis for developing evidence-based and scientific soil management strategies for sustainable soil use.	a x 9
	3. There should be a paradigm shift from traditional soil and water conservation management practices to be evidence-based management techniques.	r x 2

YEAR	RESOLUTIONS	FREQUENCY
	4. There is the dire need for sustainable solutions to combat the adverse effects of climate change on agricultural activities. Consequently, there is the need to re-vitalize the River Basin Development Authorities and irrigation facilities across the nation and extend same to other areas of need to promote year round food production and security.	r x 3
	5. There is the need to support research on decision support tools that integrate soil, water and atmosphere variables to develop climate-smart solutions to address climate change variability and renewable fresh water supply and quality, and restore degraded soils and ecosystems and advance food security.	l x 7
	6. There is urgent need to conserve the nation's soils and reclaim those that have been degraded physically, chemically and biologically through the adoption of suitable technologies tailored towards sustainable soil conservation and management, and climate change adaptation and mitigation.	i x 8

HIGHLIGHTS

The resolutions documented in Table 1 [with frequency of mention documented in Table 2] address the following thematic issues;

- The lack of detailed soil survey report which will provide information detailed enough to make research and utilization meaningful to all land users has been emphasized.
  - as a follow-up or tangent to this is the recommendations [resolutions] that the Federal Government [Units responsible] should establish the proposed Nigerian Soil Information System [NiSIS].

- Also addressed is the use of environmentally friendly fertilizer application through
  - thoroughly evaluated and tested fertility studies and extension of same to fertilizer users.
  - contigent on this is the issue of food security achievement through appropriate soil management based on soil fertility-soil type correlation studies.

- The issue of governments at all levels bringing to the awareness of stakeholders the dangers inherent in the misuse of land that leads to degradation – physical, chemical, and biological.

- The establishment of a National Soil Research Institute to cater for the different soil management requirements demanded by the different agro-ecological zones and soil types within Nigeria.

- The urgent need to seriously consider Climate Change and its devastating effect on land use and its attendant products

- The issue of well-funded regional soil science laboratories currently located at Ibadan [Southwest], Kaduna [Northcentral], and Umudike {Southeast] that will assist in the regional needs for quality soil tests/results for researchers, students and other land users

- The issue of the establishment of Nigerian Institute of Soil Science [NISS] reverberate through the Resolutions of recent years which demanded that the Federal Government should urgently assist and facilitate its establishment .

- Also addressed is the issue of collaborative work between Soil Scientists related Federal Government Departments and agencies:
  - Ministry of Agriculture and Rural Development
  - Ministry of the Environment
  - Ministry of Water Resources
  - Ministry of Works and Urban Development,

  Because Soil science is the foundation for all development programmes, agricultural and non-Agricultural.

- On education matters, capacity building should be the focus of governments at all levels:
  - awareness about the significance of soil science to the sustainable use of the environment at the lowest hierarchy of our educational system,
  - encourage the inclusion of soil science in the agriculture syllabus at all mid-levels of the education hierachy,
  - encourage the study of soil science at the highest level of the education hierachy in Nigeria ,i.e.,
    - undergraduate,
    - post grauate at M.Sc., and Ph.D levels.

IMPACTS/OBSERVATIONS

- Phone discussion with retired staff at the Department of Agricultural Land, Climate Change and Management Services, gave an indication that the Communiqué/Resolution normally got to the Department while they were on ground.
  - the change in name from the Department of Agricultural Land Resources to the present was not an indication of the impact of the Resolutions from SSSN.
  - this change took place about 2014 based on an internal memo.
  - positive impact on implementation of resolutions was epileptic depending on the mood of the Nation and the personnel of the Department of Agricultural Land, Climate Change and Management Services.
- The most noticeable impact on research execution that is yet to be notably observed as an impact is on policy development in the areas of soil fertility management and food security initiatives.
  - the resolutions have been said to influence the work that led to the production of Soil Fertility Soil Maps of Nigeria
  - additional plus to this is the semi detailed/detailed soil survey report that accompanied the food security/soil fertility initiative studies.
- There is no evidence that resolutions have ever been used or inspired research focus of researchers towards resolving challenges as identified in the resolutions
- NiSIS was getting to be active during 2013-2015. The resolutions might have influenced the interest shown by the Minister in the project then.
  - NiSIS is a national project for digital soil information storage and retrieval to be querried for different land users' needs,
  - it is normally based on detailed [quality] soil survey work, digitized and stored.
- The Soil Science National Laboratories, under the Department of Agricultural Land, Climate Change Management Services still need attention.
- Nigeria Institute of Soil Science [NISS] establishment was not due to repeated resolutions referring to its importance and therefore its establishment.
  - Its establishment was through the zeal of Professor V. Chude [immediate past president of SSSN] and the cooperation of the membership of SSSN.

CONCLUSIONS

- The resolutions have not been used as expected especially by Government Agencies with responsibilities to make recommendations towards implementing sustainable land use by different land users or formulating policies that engender sustainability of the environment..
- The relevance/significance of empowering usefulness of SSSN communiqués/resolutions in budget formulation and implementation is definitely a function of the personality of the occupants of the leadership of the

Departments with responsibility for harnessing financial and manpower facilities towards sustainable use of the environment.

RECOMMENDATIONS

1. The RESOLUTIONS sometimes are worthy and repetitive even within a communiqué for an annual meeting:
    - this brings distraction that can lead to lack of interest from the addressee.
2. Resolutions to be attractive and inviting for attention should be packaged with substantial evidences/data to advance the cause of the resolutions.
3. Resolutions should not be limited to Government agencies alone but also to those that participate in budgetary allocations- the legislature, especially those with oversight functions.
4. Resolutions may be in the form of BOOKLETS to enhance its readability storage/retrieval values.

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Faces At Ibadan 2010 Annual Conference

Faces At Ibadan 2010 Annual Conference

CHAPTER VI

SOIL SCIENCE IN NIGERIA: RELEVANCE, EVOLUTION, ACHIEVEMENTS AND CHALLENGES

BY

[1]Amusan, A.A., Fasina A.S., [2]Asadu, C.L.A., [3]Senjobi, B.A. and [4]Ande, O.T., Oluwatosin G.A., Adeyolamu D.O and Ajiboye G. A

[1]Department of Soil Science and Land Resources Management, Obafemi Awolowo University, Ile-Ife;

[2]Department of Soil Science and Land Resources Management, University of Nigeria, Nsukka; [3]Department of Soil Science and Land Management, Federal University of Agriculture, Abeokuta;

[4] Land and Water Resources Management Programme, Institute of Agricultural Research and Training, Moore Plantation, Ibadan

RELEVANCE

Soil is the bedrock for food, fibre, fuel, raw materials, foundation for most engineering constructions, sink for industrial pollution, determinant of land quality and habitat to millions of micro-organisms useful in medicine, biodegradation and recycling of wastes. Soil science is the study of soil as a natural resource on the surface of the earth including soil formation, classification and mapping, physical, chemical, biological and fertility properties of soils and these properties in relation to the use and management of soils.

Soil Science has six well defined and developed disciplined, Scope of soil science is reflected through these disciplines which are :

- Soil Fertility which is the nutrient supplying properties of Soil.
- Soil chemistry is the chemical constituent, chemical properties and the chemical reaction in the soil
- Soil physics which involves the study of physical properties
- Soil microbiology which deals with microorganisms, its population, classification and its role in transformations.
- Soil Conservation which deals with protection of soil against physical loss by erosion or against chemical deterioration i.e excessive loss of nutrients either natural or artificial means.
- Pedology which deals with the genesis, survey and classification of soils.

Soil Science plays an important role in the life of a human being. It is not only the resources for food productivity but it also helps us on waste disposal, to maintain playgrounds, to distribute and store water and nutrients, and support our environment.

Soil science has brought to knowledge the impact of mankind on fertility and fertilizer use, environmental pollution, precision farming and conservation farming. However, the impact is proportional to the age of soil science study in Nigeria. The knowledge of soil science is growing as its uses by land users. Farmers and other land users, especially, engineering are gradually felling the impact of soil science in Nigeria.

EVOLUTION OF SOIL SCIENCE IN NIGERIA

Soil science as a distinct subject started in the 1950's in Nigeria at the degree level and currently it is being taught in over 105 tertiary institutions in Nigeria. The honours course in Agriculture/Agricultural chemistry and soils inclusive was introduced in 1958/59 and the June 1960 students were the first students at University of Ibadan with the honours classification. From 1948 to 1963 the University awarded degrees of the University of London under a scheme of special relationship. However in 1963 the university received its own charter and became autonomous as the University of Ibadan and started to award its own degrees. Consequent upon the Series of re-organisation from 1966/67 up till late 1980s the Faculty has awarded B.sc (Agric) with Honours in Soil Science. With the National Universities Commission (NUC) Minimum Academic Standards, there was a re organisation following the NUC recommendation for 5year programmes that have 12months duration for Practical, there was a new degree nomenclature for Soil Science – B.Agric (Honours).

In Nigeria the necessity for a soil map to guide user has been identified from the early fifties to the sixties with the work of Vine(1953) and Smyth and Montgomery (1962). The early surveys were directed primarily at identifying good soils for growing tree crops (Mould,1960) for coffee on the Mambilla Plateau, Smyth and Montgomery (1962) for Cocoa in Central Western Nigeria, Higgings 1964 for Kola, oil palm and Cocoa in the Niger Flood Plain at Lafiagi.

The awareness of the need for soil survey in Nigeria was brought into sharp focus by the statement below that proceeded the soil report of the Institute of Agricultural Research (IAR) at Samaru in the 1960s and 1970s.

"the objective of the survey was to describe, classify and map the soils of united hills-Gongola state and so provide the fundamental information necessary for soil and land use planning(Hildebrand,1960)

The first attempt at a systematic soil survey in Nigeria was made by a British soil scientist (Vine,1953) ending up in the publication by Smyth and Montgomery (1962)

on a forested Basement complex of central western Nigeria. Many other landmark systematic soil surveys followed this one over the next 20years. They were done for various chunks of the landmark of Nigeria notable among these are :

- Badwen and Tuley (1966) for Southern Savannah and Southern Adamawa provinces
- FAO(Sombroek and Zonneveld, 1971) for Sokoto – Rima Basin.
- Baswen et al (1972) for North Eastern Nigeria.
- Vallete (1973) for the Mokwa-Kontagora, Kainji area.
- ENPLAN (1974) for the Cross River Basin
- Tahal Consultants (1979) for the mainland Cross River (now Akwa Ibom State)
- Murdoch et al (1974) for the North Western Corner of Nigeria
- Fagbami (1980) for the Rivers state (now Bayelsa and Rivers State)
- Lideco (1978) for the Mambilla Plateau.
- Bennette et al (1979) for the central Nigeria.

The areas covered by these soil surveys accounted for over 70% of the surface area of Nigeria. In other words over a period of 30years from about 1951 when vine and his team started the tedious conventional soil survey of the forested central south western Nigeria to 1982 when Geodata produced the soil map of the Cross River Basin, over 70% of the area of Nigeria had been covered by a soil map.

NALDA also did some commissioned soils survey projects for their proposed project sites in Nigeria to determine the suitability of these sites for agricultural crop production. These were done to increase food and industrial crops production throughout the country. These efforts (i.e Soil survey Projects) accounted for the success of the NALDA farm projects of the NALDA management.

Earlier on, from the late seventies to the decade of the eighties, as part of the federal Government efforts to boosts food production in Nigeria, in a first major government intervention, the country had to embark on a spate of soil surveys when through the River Basin authorities, large scale farms and irrigation projects were to be established

By the close of the decade of the nineties, the only soil maps covering the country are the 1:5,000,000 FAO/UNESCO soil map of Nigeria (1994). The FDALR soil map of Nigeria produced at a scale of 1:1,000,000 in addition to its low credibility is yet too small in scale to give satisfactory direction in project site selection, soil management and land use planning.

The use of local taxonomies systems of soil classification have been widely adopted for soil survey studies in Nigeria, with soil series being used as mapping units, the works of Smyth and Montgomery (1962) and Valette(1973), being the classical and most credible of such efforts in Nigeria to date. Later works of IART in Moore plantation and IAR in Samaru have continued to adopt these examples of local soil classification system for mapping soils, especially for small project areas.

Major works of soil survey have been carried out by Department of Agronomy University of Ibadan. Some of these soils survey projects are listed below :

- Soils and agro- environment at Ibadan area typifying the dry-tropical rainforest on basement complex(Fagbami,1976)
- Soil of the lower ofiki Basin-typifying the derived savannah in south western Nigeria. (Fagbami and Fayemi 1975)
- Land Evaluation of the new federal capital Territory (Fagbami, Areola, Jaiyeola, Banjoko and Valette,1978)
- Soils of the Rivers State Eastern half of the Niger Delta (Fagbami 1982) typifies the core Niger Delta environment.
- Soils and land use of Akwa-Ibom state (Fagbami, Lekwa and Ibanga, 1989). Typifies the most rainforest on sediments (Coastal plain sands and Coastal sand).
- Soil of Bendel state (Fagbemi,1985) covers the coastal area through the mangrove and wet forest (western segment of the core Niger Delta) and the forest on sediments to the derived savannah on basement complex in the northern tip of the present Edo State.

Soil Science was not considered as a marketable course in the university in the past (this is confirmed through the statistics of students enrolment in the last three decades in Nigeria). This is however changing due to increasing need for experts in new universities, fertilizer industries, commercial agriculture, pollution control etc. Soil Science will be very relevant in the growth and development of Nigeria in the future. A lot still need to be done to improve the prospects of soil science in Nigeria. One way is by updating the curriculum in universities across the country. In this way quality graduates will be produced with a mind-set that will improve the prospects of soil science in Nigeria.

Soil science in Nigeria is getting well developed with the recent establishment and passing into law of the Nigeria institute of soil Science. This will support the training at universities and Agricultural Institutions offering soil Science courses. The prospects of good careers as soil scientists are quite bright in view of the current Nigeria government policy in promoting Agricultural productivity and climate smart Agriculture.

The history of soil science in Nigeria is becoming richer and if well managed there is good future prospect. But there still many areas that needed to be correlated on works already done in the country. A lot of work has been done in pockets in the past that needed to be harvested for correlation studies. Soil science in Nigeria has been slow in development because of lack of high-tech instrumentation to carry out quality research. But soil Science is gradually becoming popular discipline among Nigerians.

ACHIEVEMENTS IN SOIL SURVEY AND LAND EVALUATION

Soil Science in Nigeria has witnessed significant notable achievements in its activities over the past fifty years. At the national level, Doyne *et al.* (1938) worked on soil types and fertility assessment and this led to the production of a provisional soil map in 1944 and were based on the geology and parent material types. An improved soil map was attributed to Vine (1951) (provisional soil map of Nigeria), that was based on degree of leaching, mechanical composition and organic matter content. Vine's work metamorphosed into the publication of Smyth and Montgomery (1962), on soils of Central Western Nigeria. The survey was essentially to characterize, demarcate and map areas in Central Western Nigeria for Cocoa production. It was the first commissioned soil survey effort by the Western Nigeria Regional Government. In the East, Obihara *et al*. (1963) did some illuminating soil work published at 1:50,000 on Anambra - Do River Basin and this was closely followed by Jungerius (1964), exploratory soil map of the Old Eastern Nigeria. This was essentially to map areas suitable for Oil Palm production by the defunct Eastern Nigeria Government. Klinkenberge and Higgings (1968) produced the soil map of the Northern region of Nigeria while Murdoch *et al*. (1976) characterized and classified soils of the savanna region in Nigeria. The British Ministry of Overseas Development (1957 – 1974) did a great deal of soil resources inventory works mostly in the northern part of Nigeria. In between these developments, up to the mid-late 80s, a lot of soil surveys, albeit for specific purposes especially in identifying suitable agricultural lands for River Basin Irrigation projects, were carried out. Most of these soil resource inventories were specifically commissioned to be executed at detailed - or semi-detailed levels and to identify, characterize and map soils for irrigation development. Some of these are for large-scale irrigation schemes as in Sokoto-Rima Basin (North-West Nigeria), Kano-River Hadejia - Jamaare Irrigation Project, Chad Basin Project (North-East), Niger Basin (North Central), Benin/Owena/Ogun-Osun Projects (South-West), Anambra – Imo Basin (South-East), Niger Delta/Cross River Basin (South-South) to mention but a few.

National Strategies for Soil Resources Management

Ministry, Department and Agency

The Nigeria Government has shown commitment to sustainable and productive use of the country's land resources through the Agricultural Promotion Policy (APP) launched in 2016. The core activities of APP include productivity enhancement with emphasis on access to land, soil fertility improvement, access to information and knowledge, production management, food and nutrition security. The Presidential Fertilizer Initiative (PFI) which commenced in December 2016 is a multipartite arrangement in which the Nigerian Sovereign Investment Authority (NSIA),

FMARD, Fertilizer Producers and Suppliers Association of Nigeria (FEPSAN) and the government of Morocco are involved in soil mapping of maize production belt in order to blend site specific fertilizer to enhance soil productivity. The Federal Government of Nigeria is also introducing National Agricultural Investment Plan (NAIP) in response to AU's 2014 Malabo Declaration to reduce poverty by half by the year 2025 through agricultural led economic growth. The Government is also actively addressing challenges in agricultural development through Agricultural Research Council of Nigeria (ARCN) and National Agricultural Research Institutes (NARIs). Most Nigerian Universities have strong Department of Soil Science that provides a strong base for training and empowerment of new generation of Soil Scientists ready to use innovative technologies. The government bodies responsible for soil research and mapping (IAR&T/ALRCCMS) have carried out soil resource inventories, at State/Regional levels as well as for specific single or multipurpose problem- solving soil characterization for sustainability land use or soil fertility/suitability evaluation activities (Ande *et al.,* 2015; FMARD Report 2014). The Institute of Agricultural Research and Training (IAR&T), Moore Plantation, Ibadan, with the national mandate for soil research has conducted many soil surveys since her inception as the Research Division of the Ministry of Agriculture and Natural Resources (MANR) of the old Western Region of Nigeria. The Institute has been a renowned Research Centre for agricultural development in southern Nigeria since 1969. Over 250 legacy maps spanning over 60 years are available in the Institute at various scales.

The federal department of agricultural land resources (FDALR) has commissioned over 140 soil inventories/land use planning at different levels and scales in the past three decades and this is still on-going. A systematic but generalized soil map of the country at scale of 1:650,000 was conducted in 1980 with support from USDA and was completed in 1985. The soil map was limited in its utility (Olaniyan and Ogunkunle, 2007), but provided basic information of group of soils, their extent, distribution and potentials for agricultural development.

Studies to improve soil fertility have been on the increase in Nigeria starting with introduction of inorganic fertilizers. Nigeria nutrient map was produced by FMARD in 2012 which has been used to some extent as fertilizer formulation basis recently for some crops. This is supposed to guide in fertilizer recommendation but the scale of production of the map was too large for effective use especially on small holdings characterised by Nigeria farmers. When optimal result was not obtained due to land degradation and soil variability issues, organic resources as fertilizers were introduced to improve soil fertility and soil quality. However, the limited quantity of mineral nutrients and slow release of nutrient from organic resources contributed to their limitation as a sole fertilizer. Further research led to the introduction of combined use of organic and inorganic resources to boost soil fertility and quality as

a whole. However, the impacts of these methods have been limited due to various constraints peculiar to the methods, farmers, government policy and general heterogeneity of production environment in Nigeria.

Composting is an age long practice for the biological conversion of organic waste to a humus-like substance which can enhance physical, chemical and biological soil properties. The role of compost in reducing bulk density and increasing total porosity to improve soil structure has been well reported in Nigeria (Adeyemo and Agele, 2010; Osunsanya, 2010). Composting of organic waste reduces the bulkiness of the materials required for application; improves soil organic matter, physical properties and microbial activities which in turn improves its nutritional value and enhances better nutrient uptake by crop (Adediran *et al.,* 1995). The advantages of utilizing compost reported in the literatures include its effectiveness, readily available organic materials, improved organic matter content, source of micro and macro nutrient and greater nutrient retention, easy to use and desirable residual effect in the soil (Adediran *et al*., 1995; Babalola *et al.,* 2012). Other organic wastes that compared well with mineral fertilizer or used in combination that significantly increase yield, increase P availability and general soil quality include feather meal, rock phosphate and bone meal (Akande *et al*., 2006; AyanfeOluwa and AdeOluwa, 2012).

Different types of organic fertilizers were developed over the years. IAR&T developed cassava-based compost (comprising of cassava peel and animal manures mostly poultry manure) and verticompost (consisting of vertiver grass and animal manures). These are found to be helpful in enhancing nutrient availability and release in the soil. The emergence of organomineral fertilizers comprising of organic and mineral fertilizers in required percentage. Different organic fertilizers have been produced in liquid form. Planting of cover crops or green manuring is another way of protecting and improving organic matter in the soil. Leguminous cover crops have the additional benefit of fixing atmospheric nitrogen for the benefit of crop that follows (Kang *et al.,* 1996; Ibewiro*et al.,* 2000); and protection of the soil from water and wind erosion, improved soil tilth and suppression of soil-borne pathogens (Guginо*et al.,* 2007). IAR&T has conducted studies on the use of some edible and non-edible legumes in amelioration of degraded soils with good results.

Land resources survey started majorly in Nigeria in the early 60s with the survey of the soils of the cacao growing area of Western Region (Smyth and Montgomery, 1962). Since then, almost all other parts of the country have been covered by land resource surveys. Most of the soil survey and classification done in Nigeria are general purpose type and regional. For example, Smyth and Montgomery (1962), in Central South-Western Nigeria; Moss (1957), for sedimentary soils of Nigeria; Jungerius(1964) for South-east, Klingebeil (1968), for North-east, Mudorch *et al.* (1976) for soils of the savannah areas of South-Western Nigeria. However, only in few of these do we have information on the potential of the soils for

the most common crops (Oluwatosin and Ogunkunle, 1991 and 1998). Federal Department of Agriculture and Land Resources FDALR (1985) also produced a suitability classification of Benue soils from the reconnaissance soil survey they conducted. Fagbami and Babalola (1980), grouped soils of N'gell, near Jos into classes II, III, IV, V and VI. Using four land evaluation systems, Ogunkunle and Babalola (1986), evaluated soils of lowland of Benue River and grouped them into classes for rainfed and irrigated arable crop production. Ojanuga and Isirimah (1986), carried out studies on quantitative land evaluation using soil productivity model to assess the current and potential productivity of some soils on the Coastal Plain Sands in parts of Rivers and Imo States. The model they used was based on soil productivity index relating such soil parameters that influence crop growth as acidity, drainage, nutrient levels and organic matter content. Fagbami and Akamigbo (1986), carried out series of studies on the soils of Benue State and their capabilities. They discovered the soils were highly to moderately suitable for most agricultural landuses qualitatively.

The National Agricultural Land Development Authority (NALDA) intervened in the agricultural development of Nigeria between year 1992 and 2000 (Akinsola and Oladele, 2004). During the period of operation, remarkable progress was noticed in the performance of agricultural sector. More lands were opened up and cultivated within a short time compared to what used to happen in the past.

NEED FOR SOIL INFORMATION SYSTEM

Soil information system (SIS) is an organised system to promote effective and sustainable utilisation and management of soils and related natural resources by the provision of appropriate information to decision makers. Adequate soil information can inform long term policies to facilitate productive, optimal and sustainable use of available land and stem the tide of migration which has been the single cause of major inter-ethnic conflicts. Paucity of fund allocation has hindered soil survey and research for development. Soil information system is very relevant in strategic military planning to fight current terrorism in Nigeria.

Soil is the foundation for constructions, buildings and predictions of impact of various land use, livelihood and nations' wealth. There is lack of adequate nationally and functionally coordinated soil information database to guide policy decisions for national planning, resources allocation, economic development, preservation of environment, sustainable land use, formulation of law and regulation of use of natural resources. These challenges have contributed to underdevelopment of Africa since dearth and uncoordinated soil information translate to low agricultural productivity (48% of Nigerian soils has low productivity), infrastructural failures, environmental pollution, land use induced hazards (floods, land slide, gully erosion) insecurity arising from major inter-ethnic conflicts on land disputes and global

warming. There is need for database to guide appropriate land use planning and sustainable crop production for food security. Also there is an urgent need for capacity development in digital soil mapping (DSM) and applied geo-informatics for sustainable land use (which is the current trend for improved delivery of soil information and increased coverage of mapped areas). Development of a Reference Soil Laboratory is germane for data integrity and for sound soil correlation.

Research on Bio-fertilizers

Findings increasingly revealed the role of biofertilizer (symbionts) for guaranteeing the availability of plant nutrients in soil, enhance root absorption of the nutrients and increasing crop yield (Taiwo and Adegbite, 2001; Daramola and Taiwo, 1997) even in the absence of inorganic fertilizers (Taiwo *et al*., 2001). The IAR&T is currently undertaking more researches in this area with focus on promoting bacteria that have abilities to make different nutrients available (nitrogen fixing, phosphorus solubilisation and potassium solubilisation) with phytohormone producing abilities that will be beneficial to both leguminous and non-leguminous plants in different agroecologies in Nigeria. There is poor general perception and awareness of organic fertilizers in southwest Nigeria. Difficulty in identifying a product as fit for its intended purpose and lack of guidelines, standards, and certification scheme on agricultural wastes recycling remain obstacles to farm wastes recycling in the country. Organic fertilizer production is highly laborious for farmers and needs high quantities of materials for the production.

Soil Variability and Management

The spatial variation in soil properties with land use types could not be over emphasized since it contributes to increasing rate of soil degradation owing to inappropriate land use. Soil sampling and management practices should be done in context of the complexity of soil variability. There is also need for appropriate crop combinations (cereal/legumes; cassava/legumes) based on site characteristics and improved germ plasm to tackle nutrient mining and protect soils from direct impact of climatic factors (Ande *et al*., 2017). The Agricultural Development Programme (ADP) in some part of Osun state under derived savanna ecology reported that cowpea-maize rotation resulted to higher yield of maize with little inputs due to nitrogen fixing ability of the legume (IAR&T REFILS, 2015). Use of legumes in farming system need to be promoted for sustainable soil management due to its benefits in reducing costs of inputs such as fertilisers and improvement of soil organic matter when its residues are incorporated into the soil. Hence, it can enhance soil management coping capacity of smallholder farmers. Major natural resources or farm resources or wastes that can lead to sustainable soil fertility management, crop production and increase agronomic efficiency within ecological, social and economic

situations must be identified and integrated within farming system. There is need to incorporate appropriate cropping systems (such as cereal/legume intercrop), re-visit agro forestry again for soil nutrient mining at greater soil depth and nutrient recycling.

Soil and Environmental Challenges

A survey conducted in Anambra North Senatorial District, showed that almost all the seven local government areas (Anambra East, Anambra West, Ayamelum, Ogbaru, Onitsha North, Onitsha South and Oyi) of the Senatorial District were affected through gradual removal of uniform depth of soil or gullies, which cut deep down slope. One of the major causes of gullies could be traced to developmental purposes without taking into consideration soil types. The effects of road construction in the eastern region has caused lots of gully erosion that could be felt miles away from the source of the problem. The lack of communication between civil engineers and soil scientists has caused a lot of hazard. For example, the soils of most eastern states are derived from sand stone and usually give rise to light textured soils. Activities on these soils must take into cognisance the structure, texture and bearing capacity into consideration for sustainable development. In the Northeastern Nigeria, the accelerated rate of desertification has caused increased migration of Fulani herdsmen to the South. This has been associated with lots of conflicts where herds compete for farm produce. Prevailing wind erosion and climate variability have been going on now for decades with little effort to combat it. Olafor Arnolds (2006) noted how soil as a resource is poorly cared for under international conventions, in spite of its importance.

Holistic approach to soil fertility management

Integrated Soil Fertility Management (ISFM) is defined by Africa Soil Health Consortium as 'a set of soil fertility management practices that necessarily include the use of fertilizer, organic inputs and improved germplasm combined with the knowledge on how to adapt these practices to local conditions, aiming at optimizing agronomic use efficiency of the applied nutrients and improving crop productivity (Vanlauwe *et al.,* 2011). All inputs need to be managed following sound agronomic and economic principles. Therefore, complete ISFM is the solution to effective management of soil fertility in tropical sub-humid soil (Ande *et al*., 2017). The farmers in northern Nigeria have realised the importance of increased organic manure and thus practice karaal to improve soil quality. However, other major source of organic inputs, like crop residues are used for roofing, fencing and other domestic purposes. Thus year in year out, nutrient depletion continues and more inputs are being required for optimal production.

Several studies have revealed the impacts of various land use types (Oluwatosin *et al*., 2001; Senjobi *et al.,* 2012; Ande *et al.,* 2014 and Ogunkunle, 2016). Generally, soil types were not used based on their suitability and crop requirements were not usually considered for most arable crops (Ande and Senjobi, 2007). These have resulted to poor harvest and translated to farmers' poverty. There is need for policy on sustainable land use based on their suitability to enhance soil productivity.

Soil Health and Urbanisation

Urbanization coupled with industrialization result to production of anthropogenic wastes of complex compositions that have negative impact on plant and human health. Soils serve as the ultimate sink for urban wastes which are usually loaded with heavy metals, polymers and industrial effluents which could be toxic to humans. The channels of major rivers that pass through urban areas are usually used for waste disposal while the associated peri-urban fadama soils are cultivated for arable crops production. The studies conducted around Ibadan metropolitan city revealed that the soils associated with these rivers are rich in macronutrients and some elevated levels of heavy metals (Oluwatosin et al., 2008). Ande *et al.* (2014). High levels of anions such as phosphorus (50- 250ppm) were also recorded from industrial and domestic wastes in some areas. The reckless disposal of industrial wastes had led to both soil and surface water pollution. This calls for regulation in soil use and environmental protection.

CLIMATE CHANGE AND NIGERIA'S AGRICULTURE

Nigeria's climate is changing. The country's current and future climate challenges are summarized in the National Adaptation Strategy and Plan of Action on Climate Change (NASPA – CCN):

Evidence clearly shows that the weather is becoming more extreme, be that in form of drought or rain, leading to different impacts according to climate and geographical zones.

The Nigerian Meteorological Agency (NIMET) has assessed the Nigerian climate over the period from 1941 to 2000 and has demonstrated dramatic changes in weather patterns: Irregular rainfall pattern gives rise to fewer rainy days. NIMET demonstrated that the combination of late onset and early cessation of rains led to a shorter rainy season in most parts of the country from 1971 to 2000 compared to the period of 1941 to 1970. Between 1941 and 2000, annual rainfall decreased by 2 – 8 mm across most of the country, with the exception of Port Harcourt where it increased by 2 – 4 mm. The rainfall trend between 1901 and 2005 shows a general decline. Long – term records show that over the past 105 years, the amount of rainfall per year dropped by 81 mm. The trend of declining rainfall worsened after 1970 and continues to this date. This coincides with a period of sharp temperature increases. The general

trend of a decrease in rainfall does not apply to the coastal areas, where places like Warri, Brass and Calabar have experienced a slight increase in rainfall recently.
Between 1941 and 2000, average temperature increased by an alarming rate of 1.4-1.9 degree Celsius. It is exactly the type of temperature increase that IPCC experts warned would make parts of the world uninhabitable. Given the fact that scientists project a further temperature increase of between 2 and 5 degree Celsius this century, one might wonder what kind of agriculture will still be possible in the areas most affected. Climatic changes already have varying, mostly adverse effects, on agriculture and therefore, food security in various parts of the country. Consequently, the National Adaptation Strategy and plan of action on Climate Change for Nigeria (NASPA-CCN), has identified a number of key measures with assigned roles to stakeholders at the national and sub-national levels. Higher temperatures result in decreased agricultural productivity and production, high evaporation rates and reduced soil moisture, lowering of the groundwater table and shrinking of surface water. Heat stress reduces human labour use on farms, lowers labour productivity and leads to rapid deterioration and wastage of farm produce. Changes in the amount of rain, increased rainfall intensity and changes in rainfall patterns lead to decreased resource productivity and production (crops and Livestock). Changing and erratic rainfall patterns make it difficult for farmers to plan their operations, may reduce the cropping season and can lead to low germination, reduced yield and crop failure. Erratic weather interferes with processing of produce (an example is sun-drying of crops and smoking of fish). Increased frequency of major storms causes damage to farm land, crops and

livestock. Major storms can also cause road wash-outs, which make it difficult to access farms and to market products. These trends can be reversed or halted through the following:

➢ Adopt improved agricultural systems for both crops and livestock

For example, diversify livestock and improve range management; increase access to drought resistant crops and livestock feeds; adopt better soil management practices; and provide early warning/meteorological forecasts and related information.

➢ Implement strategies for improved resource management

For example, increase use of irrigation system that use small amounts of water; increase rainwater and groundwater harvesting for use in agriculture; increase planting of native vegetation cover and promotion of re-greening efforts; and intensify crop and livestock production in place of slash-and-burn practices.

Summary

Nigeria will be faced with more major threats to soil in the future if the present situation continues without proper attention.. In Nigeria soils are being used without any law or policy for regulation. Part of the plans for the future will be roles that NISS is expected to play in regulation of land use and building strong relationship with the Government for implementation of research findings.

The generally low soil fertility and degradation call for soil science to continue to focus on soil fertility and conservation improvement by ensuring that proven technologies get to the end users. Soil pollution will be on the increase due to increasing rate of industrialisation and more urban soils are being brought to production. Thus there is a need to focus on the environment with soils as the integral part to improve plant health/ human health through soil health. Soil science needs to step up and ensure development of a robust soil information system to serve as basis for digital solution for continuous trending soil management problems. The need for soil correlation will also enhance understanding of soils and gives room for better extrapolation of management recommendations effectively. In summary the following suggestions are very crucial to Nigeria in order to significantly enhance the relevance of soil science in national development and reduce the tendencies of becoming redundant.

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(i) Holistic approach where cross cutting disciplines are integrated

(ii) Development of a robust functional soil map for Nigeria to serve as basis for a functional soil information system.

(iii) Use of modern technologies and equipment for soil research for rapid and efficient delivery of research outcomes

(iv) Improved communication of soil research findings by using experts in soil extension which are capable of simplifying soil information without loss of vital information.

(v) Establishment of a reference laboratory for standardisation

(vi) Improved / new curriculum to make soils science more demanding by integrating it properly in agric business, environmental studies and making visible its roles in other discipline.

CHAPTER VII

COMMUNITY SERVICE

BY

[1]Noma S. S, [2]Raji B. A, [3]Ibia T, [4]Ibrahim S. A. and [5]Muhammad Y. A.

.[1]Department of Soil Science, Uthamu Danfodiyo University, Sokoto
[2]Department of Agronomy, University of Ilorin, Ilorin
[3]Department of Soil Science, University of Uyo, Uyo
[4]Department of Soil Science, Abubakar Tafawa Balewa University, Bauchi
[5]Department of Soil Science, Ibrahim Badamasi Babangida University, Lapai

"*One of the great ironies of life is this: He or she who serves almost always benefits more than he or she who is served.*" - *Gordon Hinckle.*

In the last fifty years, Soil Science Society of Nigeria and indeed soil scientists have contributed enormously to the agricultural development of the country. It could also be pointed out that such contributions even predate the formal formation of the society. In most cases, these contributions can be viewed as part of their responsibility through teaching, research and administration in the various institutions where they serve.

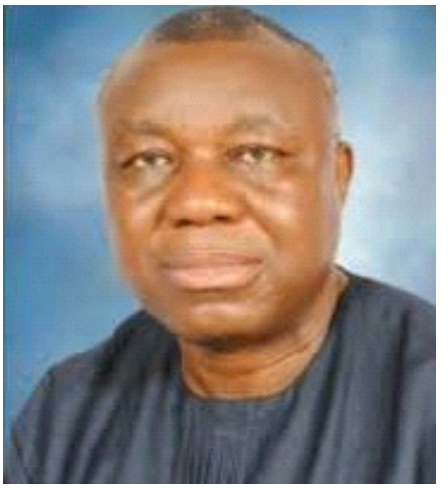
Community service is however a non-paying job performed by one person or a group of people for the benefit of the community or its institutions. Community service is distinct from volunteering, since it is not always performed on a voluntary basis. It may be performed for a variety of reasons. In most cases, our members are mandated by their Institutions as part of promotion requirements and as a way of the Institution imparting on their immediate community. In other cases, SSSN members volunteer in several organisations where they render incalculable services. Engaging in community service provides members with the opportunity to become active members of their community and has a lasting, positive impact on society at large. Community service or volunteerism enables people to acquire life skills and knowledge, as well as provide service to those who need it most.

Community services provided by SSSN members include but not limited to Ministerial jobs, vice chancellorship of Federal, State and private Universities, deputy vice chancellorship, provosts and rectors, commissioners at the State level, deans and directors of Faculties and parastatals while severals are active in various religious and social cultural associations. Many members hold chieftaincy titles of their community in recognition of their contribution to the growth of such

PROF. TRENCHARD OKON IBIA FSSSN, MNES

Prof Ibia holds a PhD degree in Soil Chemistry and Plant Nutrition and is currently with the University of Uyo, Uyo. He served as the Managing Director, University of Uyo Consultancy Limited, University of Uyo, 2000 to 2003 and Honourable Commissioner and Member, Akwa Ibom State Executive Council, Akwa Ibom State Ministry of Agriculture and Natural Resources, Uyo, between 2003 and 2007. Thereafter he was appointed as the Director and Member of Management, University of Uyo School of Continuing Education, 2011 – 2014; Member of the 9th Governing Board of the Joint Admissions and Matriculation Board (JAMB), Abuja, 2013-2015; and Member, 7th Governing Council of the University of Uyo. 2013 – 2016. Prof Ibia while on sabbatical leave also served as the Head of Department of Soil Science and Director, Centre for Entrepreneurial Development, Akwa Ibom State University, Obio Akpa, 2014. He became the Deputy Vice Chancellor (Administration), University of Uyo, Jan 2015 – Jan 2017 and is currently a Member, Governing Council of the Nigerian Institute of Soil Science, Abuja, 2018 to Date.

PROF. CHARLES IGWE



Prof Igwe is a one time former Dean, Faculty of Agriculture, University of Nigeria Nsukka between 2000 and 2000 and now the Vice-Chancellor, University of Nigeria Nsukka. He becomes the first alumnus of the University to be appointed Vice Chancellor since it was established in 1960. Professor Igwe was the immediate past Deputy Vice-Chancellor, Administration of the University. He is a Professor of Soil Science in the Faculty of Agriculture. He joined the services of the University in 1976 as a Soil Survey Assistant. He became an academic staff of the University in 1991 and rose through the ranks to become a Professor in 2003. He was appointed Deputy Vice-Chancellor (Administration) on 28th April 2016 and was reappointed in 2018. He once represented the University's Senate in the Governing. Prof Igwe, the new Vice Chancellor has pledged to take the University to the next level in his inaugural speech.

PROF UCHE AMALU FSSSN

Prof Amalu is the current DVC at the University of Calabar, Calabar. He is a Fellow of Soil Science Society of Nigeria and two-time Support Africa Deutschland e. V. (Germany) Award Winner for my researches on Food Security and Sustainable Agriculture in Sub-Saharan Africa. His researches on Nitro-limigation technique and use of water-saving super absorbent polymers (SAP) have increased yields (by 20%) and nitrogen-use efficiency(by 35%) in maize in South-east Nigeria and China respectively, while that on Sorghum crop nutrient and tillage requirements has increased yields and water use(by 15%) in Nigeria's forest-Savanna zone. In 2011, under the aegis of the German Federal Ministry of Education , Science and Technology(BMBF), his preliminary research results and proposals on "The Development of non-animal protein Foods in four different climatic zones in Sub-Saharan Africa.- (Projekttitel: "Entwicklung von nichttierischen Eiweißtr gern f r unterernährte Bevölkerungen in Sub-Saharan Africa") have led to increased consumption, cultivation and exportation of erstwhile under-utilized/neglected African leguminous crops for the reduction of Protein-Energy Malnutrition(PEM) in Children in Third-world countries.

PROF MARIAM SOLOMON FSSSN

Prof Solomon was severally the Head, Department of Soil Science, University of Calabar between January 1994-September 1996, October 2003 - September 2005 and October 2008 - September 2010. She also served as the Dean, Faculty of Agriculture, University of Calabar between October 2010 - September 2012. She became the Cross River State Coordinator, Pineapple Project between July 1999 and April 2006; Counselor/Project Director, Robert Institute for Mission and Development (RIMAD); affiliate of Ajayi Crowther University, Oyo, No 5 Robert Institute Road, satellite Town, Calabar December 1995 to date. She was appointed the Zonal Coordinator, Organic Agriculture Project For Tertiary Institutions in Nigeria2011 – 2013; Deputy National Coordinator, Organic Agriculture Project For Tertiary Institutions in Nigeria 2014 - to date. During her time as coordinator, she established the Pineapple Growers Association, Cross River State, Nigeria

PROF IVARA EJEMOT ESU FSSSN

Prof. Esu has served variously in many capacities in the academia including as Dean of the Faculty of Agriculture, 1995 - 1998, Ag Provost, 1996 - 1998, and Vice Chancellor of the University of Calabar, Cross River State, 2000 – 2005. As an astute administrator, Prof. Ivara Esu has also served this nation in numerous capacities: He was Honourable Commissioner, Ministry of Agriculture, Water Resources and Rural Development, Cross River State, 1992 - 1993, Chairman Management Board of the Federal Medical Centre, Owerri, Imo State, 2009 – Date, Honourable Minister of State for Tourism, Culture and National Orientation and member of the Federal Executive Council January – May, 2007. It is also worthy of note that Prof. Esu has received numerous honours and awards due to his enviable achievements in the society. He was elected a Fellow of the Chartered Institute of Public Administrators of Nigeria and received a Distinguished Award by the same institute 2003. More so, he is a double recipient of the prestigious Appreciation Award from the National Universities Commission (NUC), 2003 & 2004. Prof. Esu also received the 2004 Cross River State Honours/Merit Award and the 2005 Nigerian National Honours Award. Most recently, he was a delegate to the 2014 National Conference where he spoke eloquently on various pressing national issues including the passage of the Nigerian Institute of Soil Science Bill into law.

PROF YIOLA AMAPU

Prof Amapu is the current Chairman of the Federal Government Committee on AFSIS/NISIS inaugurated in 2016. He has served as Research consultant to several companies for the evaluation of fertilizers, soil amendments/ameliorants, and liquid and micronutrient-based fertilizers. He is a Consultant to the Bill and Melinda Gates Alliance for a Green Revolution in Africa (AGRA) project in a study aimed at carrying out in-depth country level studies on the constraints and opportunities for improving soil health in Nigeria (2008). He also served as Consultant to Fadama II Critical Ecosystem Management Project (CEMP) on the establishment of watershed and planning coordination capacity of the operators of State Fadama Development Committee (2009). Prof Amapu was also a Consultant to the Federal Ministry of Agriculture and Rural Development to "Update fertilizer regulation manuals and annex the to the New National Fertilizer Draft Bill 2013" (2013). He is currently a Consultant to North West Africa Division of International Fertilizer Development Center, (IFDC NWAFD) as Fertility Recommendation Expert to compile/analyze existing fertilizer recommendations for various crops and agro-ecological zones in West Africa.

PROF CAROLINE CHIBOGU MBA FSSSN

Prof Mba studied in the University of Lovanium, Kinshasa,, Republic of Congo (Zaire), the University of Gottingen Germany and the University of Kassel, Germany. She was an Assistant Professor of the University of Lovanium, Kinshasa, Republic of Congo, between 1970 and 1973 and is presently a Professor at the University of Nigeria, Nsukka, Nigeria and Anambra State University, Anambra State. She is a member of Research council, Emeagwali Centre for Renewable Energy and Material Science, Anambra State University, Anambra State. She was a member of Research council, National Centre for Energy Research and Development "NCERD" University of Nigeria, Nsukka, Nigeria. 2005-2008. A life Member of Germen Trained Afro-Asiatic Professional, University of Gottingen, Gottingen, Germany. She was the First Lady-member of Executive (Assistant Secretary) Soil Science Society of Nigeria, 1978-1980. She has benefited from the American International Development Aid Agency for Academic Pursuit, the German- Deutsche Forschungs Gemeinschaft (DFG) Bonn Agency that for Research Fellowship Award and the Katholischen Akademischen Auslander Dienst (KAAD) Agency which arranged and financed her German language training, post Doctoral training and Research in UK, France and Germany.

PROF AKIM OSARHIEMEN OSUNDE

FSSSN

Professor Osunde has since 1990 served the University as a member of several Council and Senate committees such as University Staff School Management Board (1990 – 2005), University Health Services Management Board (1994 – 2005), University Board of Research (1996 – 2001), University Ceremonies Committee (1998 – 2008), Postgraduate School Board (2001 – 2005) and many others. He has also held several important positions of responsibility in the University which include among others: Head of Department of Soil Science (1998 – 2002), Dean, Students' Affairs (2005 – 2008), Chairman, Anti-Corruption and Transparency Monitoring Unit (2008 - 2009) and Deputy Vice-Chancellor (Academic) (2009 – 2013). Outside the University community, Professor Osunde is a member of some non-governmental and community-based associations and has served as the Coordinator, African Association for Biological Nitrogen Fixation for the (Anglophone) West African sub-region (2002 – 2005), Chairman, Nigerian Universities Games Association (NUGA) Chess Committee (2001 – 2004) and was also a member of the NUGA Facility Inspection Team for the 18th and 19th NUGA Games. He is currently the Patron to the Edo State Students Association in Niger State (2010 - date) and Benin Welfare Association (a socio-cultural Association), Niger State Chapter (2008 – Date).

PROF VICTOR OKECHUKWU CHUDE FSSSN.

Prof Chude is the Pioneer Registrar/CEO of Nigeria Institute of Soil Science (NISS). Prof Chude holds a doctoral and Master of Science degrees in Soil Science from the University of Ibadan. He has to his credit over 150 publications, over 80 of which are in Journal publications in the areas of soil fertility, plant nutrition, fertilizer formulation and assessment. Prof. Chude is presently a consultant to the Hon Minister of Agriculture on Research Institutes in Nigeria; Chairman, Africa Soil Partnership and Focal Person for the Global Soil Partnership of FAO/UN in Nigeria. Prof Chude is unarguably the longest serving President of the Society (2004-2018) and has contributed immensely towards the global visibility enjoyed by the Society. Without doubt his era could be termed the "golden era". His meritorious Service to the Society include Assistant Secretary, Secretary and Vice President (2000-2003). Prof. Chude is a Life member and Fellow of the Soil Science Society of Nigeria (SSSN). He was at various times the Assistant Secretary and Secretary of the Society, as well as the Editor, Soil Science Society of Nigeria Newsletter. Professor V. O. Chude is a dynamic administrator, charismatic leader, an erudite scholar of repute, and a philanthropist of rare dimension who has impacted, in a profound way, the society where he has found himself at different times and circumstances.

PROF AYOADE OLAYIWOLA OGUNKUNLE FSSSN

Prof Ogunkunle is the President and Chairman of Council Nigeria Institute of Soil Science. He obtained a Bachelor of Science Degree (B.Sc) (Agric.) University of Ife, Nigeria 1972 and D. Phil. 1979, University of Oxford, England. He retired from the University of Ibadan, Nigeria where he rose to become Dean, Student Affairs, between 2000 to 2006 and Deputy Vice-Chancellor, University of Ibadan: 2006-2008. He was also the Chairman, Visitation Panel to Bowen University, Iwo, 2011, Member, Bowen University Governing Council, between 2012 to 2016 and Ag. Chairman, Bowen University Governing Council, 2015 – 2016. Prof. Ogunkunle is a Fellow of Soil Science Society of Nigeria (fsssn), Member, AFRICALAND Team of the International Board for Soil Research and Management (IBSRAM) and has worked as a consultant to Federal Department of Agricultural Land Resources between 1986 to 1999 and as a collaborating Scientist, IITA, RCMD Program, between 1983 to 2000. Prof. Ogunkunle is the President, Nigeria Institute of Soil Science 2018 and he also served as the Deputy Editor-in-Chief of the Nigerian Journal of Soil Science between 1985 and 2000.

PROF ABDULLAHI BALA FSSSN

Professor Bala attended the Ahmadu Bello University Zaria where he graduated with a First Class Honours in Agriculture in 1989. He obtained an M.Sc degree in Soil Chemistry and Fertility from the University of Reading, United Kingdom, in 1993 and a Ph.D degree in Soil Microbiology from the University of London, United Kingdom, in 1999. He joined the services of the Federal University of Technology, Minna in 1991 as an Assistant Lecturer in the Department of Soil Science, School of Agriculture and Agricultural Technology, from where he rose to the rank of Professor of Soil Science in October, 2010. He was at different times the Deputy Dean School of Agriculture and Agricultural Technology, Head of the Department of Soil Science, Director Centre for Preliminary and Extra-mural Studies, Deputy Vice-Chancellor (Administration) and Deputy Vice-Chancellor (Academic). He served as a member of the Governing Council of FUT Minna in 2002-2004 and 2012-2016. He is currently the Vice-Chancellor of the Federal University of Technology Minna, a position he has been occupying since December 2017. Between 2004 and 2007, Professor Bala was an Associate Policy Analyst with the Independent Policy Group, a think tank of the then Nigerian leader, President Olusegun Obasanjo, where he worked extensively on contemporary policy issues especially in the Agricultural sector. He also worked as an internationally recruited scientist (IRS) for the International Institute of Tropical Agriculture (IITA) Ibadan between 2010 and 2012, and served as the West African Coordinator of *N2Africa*, a research for development project sponsored by the *Bill and Melinda Gates Foundation*. Professor Bala holds the traditional titles of Jagaban Ilmin Bosso and Walin Zazzau Suleja.

DR RAKIYA ABDULLAHI

Dr Rakiya Abdullahi hold a PhD degree in soil microbiology from university Malaysia Sarawak in 2016. She obtained her BSc degree in General Agriculture and MSc soil microbiology in 1995 and 2005 from university of Maiduguri, respectively. She served as faculty member of arts from 2016 to April 2019. She is currently the postgraduate coordinator in the Department of Soil Science and faculty representative of Social and Management Sciences University of Maiduguri.

PROF DEMIAN ASAWALAM FSSSN

Prof. Asawalam holds a Ph.D in Soil Fertility and Plant Nutrition obtained from University of Nigeria, Nsukka. He is currently a staff of Michael Okpara University of Agriculture, Umudike (MOUAU), Abia State, Nigeria. He was the Head, Soil and Plant Nutrition Division, Rubber Research Institute of Nigeria (RRIN) Benin City (1989 – 1991 and Research Fellow at International Institute of Tropical Agriculture, Ibadan (1994 – 1997). He has served as Editor–in–Chief of the Journal of Sustainable Agriculture and Environment (2012 – 2014) published by MOUAU. He was Dean, College of Crop and Soil Sciences, MOUAU (2012 – 2015). He has served as Chairman and member of many administrative committees as well as three-time Head of Department. While on Sabbatical leave in 2017, Prof. Asawalam was a Senior Research Adviser to The Shell Petroleum Development Company of Nigeria. He has served the Soil Science Society of Nigeria as Assistant Secretary General, Editor of SSSN Newsletter, Deputy Editor – in – Chief of Nigerian Journal of Soil Science (2010 – 2018) and currently, is the Vice President, SSSN (2018 – date).

PROF JOSHUA OLALEKAN OGUNWOLE

Prof Ogunwole is an international renowned soil physicist and the current Vice Chancellor of Bowen University, Iwo. Prof Ogunwole obtained PhD in Soil Physics in 2000 from Ahmadu Bello University, Zaria and was appointed a full Professor in 2007. He successfully organized an International Workshop on Soil Physical Processes in West Africa at Ahmadu Bello University in 2012. Before his current appointment, he was the Director of Advancement at the Federal University Dutse Ma, Katsina State. He was also the Head, Department of Soil Science at the Ahmadu Bello University, Zaria between 2014-2016. He received the following honours and distinctions; 2013-2014 Georg Forster Research Fellowship (for Experienced Researcher) of the Alexander von Humboldt Foundation, Germany (2013/14), and between 2010 and 2015 he was a Regular Associate Award of the Abdus Salam International Centre for Theoretical Physics, Trieste-Italy. Prof Ogunwole was in 2010 won a TWAS-UNESCO Associateship Award to International Water Management Institute (Sub-regional Office for East Africa and Nile Basin), Addis-Ababa-Ethiopia. Between 2009 and 2010 he was Fulbright Visiting Scholar Award to Pennsylvania State University, USA. He is cited in the 2003-2004 in Marquis Who's Who in Science and Engineering, 7th Edition.

PROF FELIX KOLAWOLE SALAKO

FSSSN

Prof Salako is the current Vice Chancellor of Federal University of Agriculture, Abeokuta. Professor Salako joined the Federal University of Agriculture, Abeokuta (FUNAAB) in year 2000 as a Senior Lecturer and in 2006 he became a Professor of Soil Physics. He was the Acting Head of Department between 2001 and 2006. He served as the Director, Agricultural Media Resources and Extension Centre (AMREC) between 2008 and 2011; Pioneer Director, Centre for Community-Based Farming Scheme (COBFAS) from March 4 to September 18, 2011. He was a two-term Deputy Vice-Chancellor (Development) between 2011 and 2015. Professor Salako was listed in Marquis Who-is-Who in Science and Engineering, Eighth Edition, 2005-2006. He won Grants from the Third World Academy of Sciences (TWAS), and Training and Research in Italian Laboratories (TRIL) of the Abdus Salaam International Centre for Theoretical Physics (ICTP), Italy. He is currently the Southwestern Nigeria Coordinator (2016-Date), African Cassava Agronomy Initiative (ACAI), a Bill and Melinda Gates Foundation-Funded Project of the International Institute for Tropical Agriculture (IITA), Nigeria. He has been an Associate Editor of the reputable Journal of Soil and Water Conservation, Iowa, USA since 2009; and Editor, Nigerian Journal of Tillage Research since 2014. He holds the chieftaincy titles of *Asoludero* of Iwoye Ketu and *Bobatolu* of Isaga Orile, Ogun State as marks of his contributions to rural community development.

PROF SAMAILA S. NOMA

Prof Noma is a Professor of Soil Management since 2012. He became Acting Head, Department of Soil Science, UDUS, BETWEEN 2004 and 2007 and the Pioneer Acting Head, Department of Soil Science, Kebbi State University of Science and Technology, Aliero, March, 2008 to January, 2009. He is the Editor-in-Chief, Journal of Agric. and Environment, Oct. 2014 to Date; Editor-in-Chief, ASUU Journal of Science September, 2015 to Date and the Deputy Dean, Postgraduate School, October, 2016 to June, 2017. He became the substantive Dean, Postgraduate School, July, 2017 to Date. Prof Noma is a Council Member of Nigeria Institute of Soil Science since 2018, representing the Northwest geopolitical zone of the country.

PROF E. J. UDO

Prof Udo holds a PhD degree in Soil Chemistry and before his demise was a staff of the University of Uyo. He served the SSSN as the Deputy Editor-in-Chief, of the Nigerian Journal of Soil Science; the Dean, Faculty of Agriculture, University of Calabar; between 2000 and 2001 was the Honourable Commissioner and Member, Akwa Ibom State Executive Council, Ministry of Agriculture and Natural Resources, Akwa Ibom State.

P'ROFESSOR STEPHEN OLUSOLA OJENIYI

Professor Ojeniyi attended Waite Agricultural Research Institute, University of Adelaide, South Australia between 1976 and 1979 where he obtained a Ph.D in Soil Science. He enjoyed Western Nigeria Marketing Board and Federal Government (B.Sc) scholarships, Rockefeller Foundation (M.Sc) and Commonwealth (ph.D) scholarship. Prof Ojeniyi was cited in outstanding intellectuals of 20th century (IBC), One Thousand Great Intellectuals Scientist 2002 (IBC Cambridge), and 2003 Who's' Who in Nigerian Book of Great people.

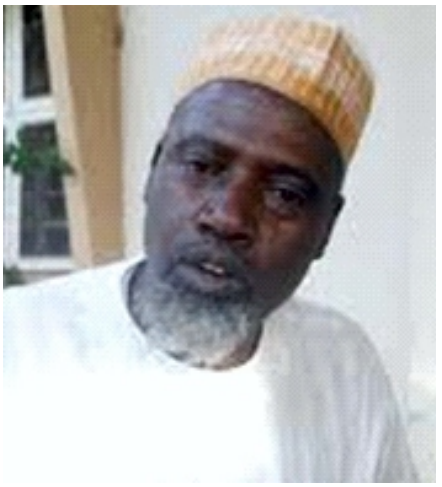
After Ph.D, he served at Cocoa Research Institute of Nigeria as Senior, Principal and Assistant Chief Research Officer (1978-82), Principal Lecturer College of Education Ila, (1982-83), Senior Lecturer at University of Technology Bauchi (1983-84), and Federal University of Technology, Akure as from 1984 to become Professor in 1992. He served as visiting Associate Professor of Soil Science at University of Agriculture Makurdi (1992-93) and visiting Professor and Head of Soils Department University of Agriculture Umudike (1999-2000) and Visiting Professor and Head of Department of Agricultural Production and Management Sciences, Tai Solarin University of Education Ijebu-Ode (2006-2007). Prof Ojeniyi was Dean of Agriculture at Ila, Coordinator School of Agriculture ATBU, Bauchi, Head of Crops Production in FUTA (1994-95) and Dean of Agriculture between 1995 and 1997. He also served as Assistant Secretary and Secretary Soil Science Society of Nigeria (1992-2001) and now Editor-in-Chief, Managing Editor, Nigerian Journal of Soil and Tillage Research and President, International Soil Tillage Research Organisation, Nigeria Branch. Prof Ojeniyi was Managing Editor, Applied Tropical Agriculture and Associate Editor Nigeria Agricultural Journal.

PROF OLUYEMISI FAWOLE

Prof Oluyemisi Fawole holds a B.Sc Microbiology, 1982(Univ. of Ilorin); M.Sc., PhD Microbiology from the University of Ibadan (1985 & 1990). She started her working career from the Nigeria Stored products Research Institute (NSPRI from 1991 to 1992, LAUTECH, Ogbomoso between 1991 and 1992 before joining University of Ilorin since 1992-Date. She served as the Acting HOD Agronomy Department between 2015 and 2017. Prof Fawole also served as the Assistant Director, Centre for International Education from 2012 to 2015 and the Sub-dean, Faculty of Agriculture between 2006 and 2010 all at the University of Ilorin. Prof Fawole has supervised several postgraduate students in the areas of Manipulation of soil microbial populations for improved soil fertility; Soil borne microbes associated with deterioration of seeds, seedlings and fruits; Development of bio-herbicides and bio-fertilizers from soil micro-organisms. She is a 2015 FELLOW of African Women in Agricultural Research and Development (AWARD) and Member, Ekiti State Development Council between 2008-2010; and 2013-2014.

PROF BASHIRU ADEMOLA RAJI FSSSN

Professor Raji holds a doctoral degree in Soil Science from Ahmadu Bello University, Zaria and a postgraduate diploma in Soil Survey using remote sensing from the International Institute for Aerospace Survey and Earth Science, Enschede, The Netherlands. Prof Raji is the Chairman, CBT Centre, University of Ilorin. He was the Dean of Students Affairs Division of Ahmadu Bello University, Zaria between 2008 and 2010. He was the Head, Department of Soil Science, Faculty of Agriculture, and the Director, Directorate of Academic Planning and Monitoring of the University between 2006 and 2008. He also served as the Assistant Dean (Postgraduate) for the Faculty of Agriculture between 2003 and 2005. He was the Second substantive Vice Chancellor, Fountain University, Osogbo between 2012 and 2016. Prof Raji has also served as consultant to government (Federal and State-NALDA, FME, FMARD), private sector and International organization (World Bank, FAO, African Development Bank, International Finance Development Corporation (IFDC). He has served diligently as the Assistant Secretary, Soil Science Society of Nigeria (1999-2003); Treasurer, Soil Science Society of Nigeria (2003-2016); Vice President (2016-2018) and currently National President of the Soil Science Society of Nigeria. Professor Raji was elected a Fellow of the Institute of Corporate Administration of Nigeria and African Scientists Institute (ASI).



PROF BASHIR GARBA ALIYU BABAJI FSSSN

Prof. BABAJI Garba Aliyu holds Ph.D in Agricultural Engineering from Cranfield Institute of Technology, U.K., 1987. He is a Professor of Soil and Water Conservation/Soil Physics at Abubakar Tafawa Balewa University, Bauchi. He was the Vice Chancellor of Abubakar Tafawa Balewa University, Bauchi between 2004 and 2009. He attained the rank of a Professor in Oct. 2002. He has also been opportune to serve and also chair many committees both within and outside the University system. Prof Babaji served as the chairman of the NUC Step-B committee as well as the chairman of the Technical Committee on Unified ICT Solution while on sabbatical at the National Universities Commission. Prof Babaji is currently a lecturer in the Soil Science Department of the Abubakar Tafawa Balewa University, Bauchi. Prof Babaji has supervised over twenty postgraduate students as major supervisor for M Sc and Ph D programmes. He has served as external examiner for ABU Zaria, University of Maiduguri, FUT Yola, College of Education, Azare and College of Education, Potiskum for both undergraduate and post graduate programmes.

DR FOLUKE IYABO OLUWATOYINBO FSSSN

Dr (Mrs) Foluke Iyabo Oluwatoyinbo holds a PhD Soil Science from the Obafemi Awolowo University, Ile-Ife and started her career as Assistant Tutor in the Federal College of Agriculture, Ibadan 1978. She attained the ranks of a Chief Lecturer in 1997. She served in and headed several vital committees of the College. She also headed two departments at different times. Dr Oluwatoyinbo was appointed as Provost of the College between January 2009 and December 2013. Her tenure as Provost impacted profoundly on the neighbouring communities. Annual Vocational Training of farmers, prospective farmers, retirees, unemployed youth and other interested people in modern techniques and skills in various aspects of Agriculture free of charge was carried out. An average of 200 participants were trained and empowered (with starter kits) per annum. In order to stimulate the interest of youth and motivate them towards adopting agriculture as a vocation, three secondary schools were adopted by the College. Young Farmers' clubs were established and monitored closely in each of the schools. The College established and supervised at least one agricultural enterprise(poultry, rabitary, maize cassava farm, vegetable garden etc.) in each school.

PROF SUNDAY ABAYOMI FASINA FSSSN

Prof Fasina holds a Ph.D degree from University of Ibadan, Ibadan. He is a Professor of Pedology, Soil Survey and Land Evaluation. He started his academic career from the Lagos State Polytechnic, ikorodu before moving to the Ekiti State University, Ado-Ekiti. He is currently a professor and Deputy Vice Chancellor with the Federal University Oye Ekiti. Before this appointment, he served as the Head of Department, Dean of Faculty of Agriculture, Director of Advancement centre and International leakage and Chairman Association of Deans of Agriculture in Nigeria. Prof Fasina is the Chairman University TETFUND Training and Research committee of the Federal University Oye Ekiti and Project Coordinator/Consultant for International Atomic Energy Agency (IAEA) on Small-Scale Irrigation for High Value Crops in Nigeria (2008 – till date). He has also attracted funds from International Atomic Energy Agency, Austria to the tune of N8,119,500, $200,000 for technical Drip Irrigation project for the production of high value crops at some selected IDP camps in Nigeria (2018). He served as the Chairman of the Local organising Committee for the SSSN Annual Conference of 2009 held in Ado-Ekiti.

PROF SAMINU ABDURAHMAN IBRAHIM FSSSN

Prof Ibrahim obtained a B.Sc degree in Agriculture from the University of Maiduguri, Nigeria in 1983. He went through a postgraduate programme and graduated from the Ahmadu Bello University Zaria with M.Sc. (Soil Science) in 1989. Prof Ibrahim obtained a *magna cum laude* Ph.D. from Justus Liebig University, Giessen Germany in 1998. He worked at different times at the Usmanu Danfodiyo University, Sokoto, Nigeria as a lecturer, Justus Liebig University as a research assistant, and Abubakar Tafawa Balewa University Bauchi, as a lecturer. Prof Ibrahim also held some responsible positions in the two universities in Nigeria which included but not limited to Head of Department, Soil Science, Deputy Dean Postgraduate School, Dean of Postgraduate School, Dean, Faculty of Agriculture, Director Academic planning and Director Information and Communication Technology Centre. A Professor of Soil Science, IBRAHIM was the Vice-Chancellor of the Abubakar Tafawa Balewa University, Bauchi, Nigeria from April 2014 to April 2019. As a university administrator, he is committed to general improvement to facilitate teaching and research. During his tenure he was able to attract several external interventions to the University, one of which was the main Library intervention project at Gubi Campus by NNPC, worth close to N2Billion.

PROF ABUBAKAR MUSA KUNDIRI FSSSN.

Professor Abubakar Musa Kundiri was appointed the Vice-Chancellor of the Federal University Wukari, Taraba State in February 2016. Prior to this, he was the Vice-Chancellor of the Federal University Dutse, Jigawa State. He is Professor of Soil & Water Resources. Between 1991 and 1995, Professor Kundiri was at Cranfield University, United Kingdom where he earned the Doctor of Philosophy (PhD) Degree in Soil and Water Management. He was among others, Dean of Students at the University of Maiduguri from 2004 to 2009. He was also member of the Governing Council of the Ramat Polytechnic, Maiduguri. Professor Kundiri was a pioneer staff of the Federal University, Dutse where he was the Dean of Agriculture as well as Dean of Students. He was also the Deputy Vice-Chancellor, acting for the Vice-Chancellor on various occasions and taking on special assignments to help in the growth of the young University.

Professor Kundiri has also served as Board Member of the Joint Admissions and Matriculations Board (JAMB), where he is also the Chairman of Committee of Chief Examiners in addition to serving as the Chief Examiner for Taraba State. He is also a Member of the National Research Committee of TETFund. Prof Kundiri is a keen sportsman, enjoys reading, travelling and married with children.

PROF JIBRIN MOHAMMED JIBRIN, FSSSN

Prof Jibrin is a Professor of Soil Science in the Faculty of Agriculture, Bayero University, Kano. He holds a PhD degree from Ahmadu Bello University, Zaria (1999). He was the Pioneer Head of Department of Soil Science, Bayero University, Kano (2009 to 2012) and has been the Director of the Centre for Dryland Agriculture since 2012, which he led to become one of the World Bank supported Africa Centres of Excellence. Jibrin Mohammed Jibrin has been a life member of the Soil Science Society of Nigeria (SSSN) since 2005. He is also a member of several other professional associations including the International Union of Soil Science, Soil Science Society of America, American Society of Agronomy, Crop Science Society of America, African Network for Soil Biology and Fertility (AfNET), and the Agricultural Society of Nigeria. He designed and managed the first website of SSSN at no cost for three years. He has, through the Africa Centres of Excellence Initiative, established one of the best equipped soil testing laboratories in Nigeria at Bayero University. The laboratory is equipped with facilities for Microwave Atomic Emission Spectrometry (MPAES), Automatic CHNS analyses, Near Infrared spectrometry, Ion Chromatography, X-ray Florence spectrometry, and Microwave Digestion among others.

PROF AKIN OLAYINKA FSSSN

Prof Olayinka was appointed as the pioneer Rector of the College of Technology (now Iresi Polytechnic) in Iresi, Osun State and served between 2007 and 2013. Being a community-sponsored Institution, he relied on indigenes and their well-wishers for funding. Despite the funding challenges, he succeeded in erecting seven buildings with assistance of the Iresi indigenes including Administration, Library, Auditorium, Lecture rooms, Workshops and Computer Resource buildings. Four courses were accredited in 2013 by the National Board for Technical Education (NBTE), namely, Accountancy, Computer Engineering, Computer Science and Electrical/Electronics Engineering. Between 2009 and 2011, Prof Olayinka served as the Dean, Faculty of Agriculture, Obafemi Awolowo University Ile-Ife. He served the Society as its Business Manager for several years from 1995 to 2017. Between 2011 and 2015, he also served as National President of Iresi Progressive Union (IPU), a socio-cultural apolitical association of Iresi indigenes. Indigenes and their well-wishers celebrate a week-long series of activities culminating in Iresi Day featuring cultural display and the honouring of illustrious indigenes and well-wishers with Awards and Chieftaincy titles.

PROF BASHIR HARUNA USMAN FSSSN

Prof Usman studied at the University of Reading, United Kingdom where he obtained a Master Degree in Soil Chemistry in 1985, and Wye Collage (now Imperial Colleges) London where he bagged a Ph.D in Soil Fertility and Fertilizer Management in 1989. He transferred his service to Moddibo Adama Univeristy of Technology, Yola in 1995 from University of Maiduguri. He attained the apogee of his career as a Professor in 2006, serving in various capacities to attain the position of the Vice Chancellor in the same University. On August 1, 2016, President Muhammadu Buhari (GCFR) appointed him as the fifth Executive Secretary, National Commission for Nomadic Education (NCNE), Kaduna. Prof Usman has as a result of clashes between farmers and herders, he led the NCNE team to join the Federal Ministry of Agriculture and other stakeholders in the development of National Livestock Transformation Plan (NLTP) – a FG initiative aimed at encouraging the pastoralists to adopt ranching instead of herding which brings them into conflict with farmers. In confronting the enormous challenges of social mobilization of his target groups, Prof Usman acquired an AM Radio Broadcast License with an operating frequency of 720KHz for an initial period of five (5) years. This is serving as the vehicle for social mobilization and education in furtherance of the Interactive Radio Instruction (IRI) methodology adopted by the Commission to reach the very hard to reach segment of our target population.

PROF JAMES A. ADEDIRAN FSSSN

Prof Adediran is a Research Professor in the Institute of Agricultural Research and Training of the Obafemi Awolowo University. Prof Adediran was an Agricultural extension agent/superintendent in the Ministry of Agriculture and Natural Resources between 1976 and 1979. He holds PhD degree in Soil Fertility in 1987 and accomplished post-doctoral studies in Agricultural Research Management in 1988. In 1989 he joined the Institute of Agricultural Research and Training (IAR&T), Obafemi Awolowo University. Prof Adediran was the Coordinator of Central Laboratory Services (1993-1995), Head of Soil Fertility Unit (1995-1996), acting Head of Soil and Water Management Programme (1997-1999), was on Sabbatical Leave on Research Fellowship to University of Fort Hare, South Africa (2000-2001), Head of Land and Water Resources Management Programme (2003-2006), Deputy Director of the Institute (April, 2006 – March, 2010), Head, Publication Unit and Editor-In-Chief, Moor Journal of Agriculture in the Institute. He also served as the Director of the Institute from 2013 to 2019. Prof Adediran received many valuable professional and community merit awards to his credit. He has been giving community services after receiving a Chieftaincy title about a decade ago.

PROF YAKUBU MUHAMMAD

Prof Yakubu Muhammad is a Professor of Pedology and currently works with the Department of Crop Production, Ibrahim Badamasi Babangida University Lapai. He is the current Provost, Niger State College of Education, Minna since 2017 to date having served as the Deputy Vice Chancellor, IBB University from 2012 to 2017. Prof Muhammed also served as the Director, Academic Planning, IBB University, Lapai between 2010 and 2012. He has also served as the Director School of Remedial Studies New Bussa, Feb 2010 to Nov, 2010 and Head of Department, Soil Science and Agricultural Engineering, Usmanu Danfodiyo University, Sokoto from 2007 to 2009. Prof Mohammed is current the President General, Association of Kambari People (AKAP) since 2013 to date.

Dr. Aisha Abdulkadir

Dr. Aisha Abdulkadir was born on 11th May, 1976 and hails from Makarfi LGA, Kaduna State. She obtained both her B. Agric and MSc Soil Science degrees from Ahmadu Bello University, Zaria, Nigeria. She obtained her PhD from Wageningen University, The Netherlands, where she worked with Late Prof. Herman van Keulen (Soil Physicist) and Prof. K.E. Giller on modelling nutrient flows and balances in agroecosystems with MONQI model. She is employed by Ahmadu Bello University (ABU), Zaria, in the Department of Soil Science since the year 2002 with specialization in Soil Physics, and where she is involved in teaching and supervision of both undergraduate and postgraduate students. She worked with several committees in the University community and beyond. She received an individual research grant from International Foundation for Science (IFS) in 2013, and African Fulbright Research Program as a senior visiting scientist at the University of Nebraska, Lincoln, USA, in 2017, where she worked on greenhouse gas emissions from soils under different water and nutrient management. She is currently the Programme Leader of Farming Systems Research at the Institute for Agricultural Research (IAR), ABU Zaria.

Dr Victoria Udoogboreyon Aiboni

Dr Aiboni is a retired Professor of Pedology at the Federal University of Agriculture, Abeokuta. She obtained her M.Sc in Agronomy from the famous Friendship University of Moscow in 1971 and her PhD in soil Science in 1986 from the University of Ife, Ile-ife now Obafemi Awolowo University. She started her working career from Ministry of Agriculture and Natural Resources, Benin City in 1971 as a Research Officer. Between 1976 and 1978 she taught at the College of Agriculture, Anwai, Asaba and transferred her services to the Edo State University, Epkoma now Ambrose Alli University in 1979. In 1995 she joined Federal University of Agriculture, Abeokuta (FUNAAB) and retired in 2009. Dr Aiboni served as the Head of Department at FUNAAB between 2006 and 2008. She was the Project Leader, NARP/NCRP Soil & Water Management project, UNAAB and Team Leader of various soil survey projects. Dr Aiboni served as the Treasurer, Nigerian Association of University of Women UNAAB Chapter from 2002-2005. She supervised several undergraduate and postgraduate students.

Professor Martin Atu Ngozika Anikwe M.Sc, Ph.D. FSSN.

He obtained a Ph.D. in Soil Physics and Conservation from Department of Soil Science, the University of Nigeria Nsukka in 2000. In 2007, Martin rose through the ranks to the position of a Professor of Soil Science of Enugu State University of Science and Technology.

Professor Anikwe has served meritoriously in many capacities as an energetic and industrious teacher and researcher. He served as Head of Department of Agronomy and Ecological Management from 2000-2006, Director of Consultancy Services of this University from 2007-2011, Hon. Commissioner, Ministry of Agriculture and Natural Resources, Enugu State from 2011-2013. He was also the Executive Director, ESUT TRUST FUND, and Financial Secretary, Soil Science Society of Nigeria. He is currently serving as Dean, Faculty of Agriculture, ESUT.

Prof. Martin Atu Ngozika Anikwe was the 20th inaugural lecturer of Enugu State University of Science and Technology.He is currently serving the SSSN as the Editor-in-Chief of its flagship journal (The Nigerian Journal of Soil Science). He is also a member of the International Union of Soil Science and International Erosion Control Association. Prof. Anikwe has won many academic awards, fellowships, and Scholarships. He was the winner, distinguished individual research presentation award at the 2nd Nigerian Universities Research and Development Fair organized by National Universities Commission of Nigeria in 2005, Abuja, Nigeria. He was awarded the fellowship to attend 2007 College on Soil Physics at AbdusSalam International Centre for Theoretical Physics at ICTP Trieste Italy Oct. 22nd to 9th Nov 2007. Prof. Anikwe was enlisted in Who is Who in Science and Engineering, Eighth Edition, 2005.

PROF TEMITOPE OKUSAMI

Prof Okusami obtained his PhD Soil Science in 1981 from the University of Minnesota. The Professor of Pedology, Soil Survey, and Land Use is currently at the Federal University Wukari since Dec. 2016. He retired from the Obafemi Awolowo University [OAU], Ile-Ife, in 2013 having served since October 1972. He had also served as consultant to the Department of Agricultural Land Resources of the Federal Ministry of Agriculture and Rural Development at Abuja. He is currently the Director of Research and Publications Unit at the Federal University Wukari. While at OAU, he was the Acting Head and Head of the Department of Soil Science in 1995/1997 and 2002/2004 and Dean of the Faculty of Agriculture in 2007/2009 academic years. In these positions he strongly advocated and successfully passed through the Senate curriculum changes and change of name of the Department of Soil Science [other departments inclusive]. Scholarships and fellowships received included an award from the United States Agency for International Development [USAID] for the M.Phil., degree in 1970-1971 at the University of Ife. UNESCO also gave a fellowship towards participating in the Hydrological Decade Programme in Hungary [February –July 1972]. Other awards for academic development include Research Fellowships of International Institute of Tropical Agriculture [IITA] at Ibadan in 1979; German Academic Exchange [DAAD] visiting grant in October-December, 1990; Third World Academy of Science [TWAS] Associate Membership Scheme of Centers of Excellence in the South grant to the Institute of Agronomy, Campinas, Brazil for a three month stay each during the years 1998 and 2000. Travel grants were also received from International Center for Theoretical Physics for a visit to the Center [April 15-May 10, 1985]. Among other service committees he was a member of the Inland Valley Consortium hosted in Ivory Coast and pioneer Chairman of the Technical/Advisory Implementation Committee on African Soil Information Service [AfSIS]/Nigerian Soil Information Service [NiSIS] headquartered at the Department of Agricultural Land Resources and Climate Change Management Services [ARCCMS] of the Federal Ministry of Agriculture and Rural Development between February 2014 and October 2016; Scientific Adviser, International Foundation for Science [IFS] in Stockholm/Sweden, 2002-2008.