Report on Academic activities of National Mathematical Centre Abuja, Nigeria (January 2015- May 2016)

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Institutional Information

- The need for an Institute for Mathematical sciences, like the National Mathematical Centre, Abuja became appropriate in view of the poor performance of candidates in Mathematics at all levels in Nigeria. Mathematics and mathematical sciences at the Primary and Secondary School levels for instance, remain unfriendly to most pupils and students, as evidenced by their poor performance in public examinations. Similarly, at the graduate and postgraduate level, the quality and quantity of courses offered, researches undertaken and graduates produced in mathematical sciences in Nigerian universities had been on a downward trend. The idea of a National Mathematical Centre therefore was conceived to remedy the deplorable performance.
- National Mathematical Centre is a Federal government Institution (An inter University Centre for Mathematical Sciences) established in 1989 to develop appropriate initiatives and resources of international standing for re-awakening and sustaining interest in the mathematical sciences and their applications, and also as an adequate response to the dramatic decline in the production of teachers and specialists in the mathematical sciences comprising Mathematics, Mathematical Science Education, Statistics, Computer Science, and Theoretical Physics.

Institutional Information cont…

National Mathematical Centre, Abuja is COMSATS Centre of Excellence in mathematical modelling and it is repositioning itself as a frontline player in mathematics, modelling, simulation and science. NMC recently hosted the second COMSAT International Thematic Research Group on Mathematical Modelling and Simulation meeting on 30th December 2015. This meeting was preceded by the hosting of NMC-COMSAT-ISESCO International conference on Mathematical Modelling on 28th -29th December 2015.

Mission of the Institution

- Rekindling and sustaining interest in Mathematics and Mathematical Sciences and their applications at all levels of the Nigerian educational system, for national scientific and technological progress through the development of Mathematics, Mathematical Science Education, Statistics, Computer Science, and the Theoretical Physics
- Creation of an enabling environment favourable for speedy technological and industrial revolution by promoting appropriate manpower capacity building required for the growth process.

Role in the Country/Region

- The role of the Centre as enunciated in the decree setting up the Centre are as follows:
- Train and develop high-level personnel in Mathematical Sciences including Mathematics, Statistics, Computer Science, Mathematical Science Education and Theoretical Physics for Nigeria and African institutions;
- Attract good mathematical scientists from all over the world in to the service of Nigeria;
- Encourage and support activities leading to the improvement of the teaching and learning of Mathematics at all levels;
- Identify and encourage young talents in Mathematical Sciences;
- Prepare Nigeria for a leading role in Mathematical Sciences;
- Enhance collaboration among mathematical scientists especially, between young Nigerian scientists and other advanced scientists from within and outside Nigeria.

Role in the Country/Region

- Create a resource Centre to serve national and international communities as a focal point for advanced research and training in Mathematical Sciences and Applications.
- Stimulate enthusiasm for the physical sciences in young Nigerian students and scholars.
- Tackle national set-goals in the development of Mathematics Sciences.
- Provide facilities motivation for teachers and educational institutions at all levels.
- Conduct series of specialized lectures or courses for the purpose of upgrading postgraduate students in the field of Mathematical Science to a level where they can begin to understand research papers and seminars.
- Conduct series of research lectures for advanced postdoctoral and other participants based on asset of assigned research papers with the objective of generating questions that would be collated, discussed and used to determine new research direction for participants.

Role in the Country/Region

- Conduct seminars, workshops and symposia in such areas the Academic Board of the Centre, may from time to time determine or plan.
- Establish and execute Visiting Programme for Mathematical Sciences, under which they can visit the Centre for short period to work on their individual research problems using the library, computing laboratory and other facilities of the Centre.
- Applications of mathematical sciences through Mathematical Modelling/Simulation.
- Mathematical Improvement Project (MIP)/Kit Project (PMK).

Vision Statement

To become a world class Centre of excellence for research and training in the Mathematical Sciences capable of promoting the development and socioeconomic impact of Mathematical Sciences in Nigeria, as well as using mathematical Sciences to solve important scientific and technological problems.

MISSION STATEMENT

To develop appropriate initiative and resources of international standing for the re-awakening and sustaining interest in the mathematical sciences and their application to life and by so doing produce Specialists in the Mathematical Sciences at all levels of our educational system.

How Centre is being governed

- By the law establishing the Centre, it is subject to the authority of two bodies namely:
- **The Governing Council** whose responsibility it is to “exercise general control and
- superintendence of the policy, finances and property of the Centre, including its public relations”.
- **The Academic Board** this is invested with the responsibility to “formulate and continuously evaluate the
- academic programme of the Centre, and to perform such other functions as are tradition to such bodies as the Governing Council may, from time to time direct”
- In the process of conducting the day to day management of the Centre, the Governing Council and Academic Board require the services of committees to deal with particular area of work. These Committees could be standing committees or ad hoc committees.

GOVERNING COUNCIL

Decree No. 40 of December, 1989 provides for the autonomy of the National Mathematical Centre, Abuja as a corporate body. The Centre, in this regard, has a Governing Council which shall comprise a Chairman, the Director & Chief Executive of the Centre and 11 other members.

The Governing Council is the governing body of the Centre and it is charged with the general control and superintendence of the policy, finances and property of the Centre, including the public relations.

It is also the responsibility of the Governing Council to ensure that proper accounts of the Centre are kept and audited annually by an independent firm of auditors

Members of the Council

- Members of the Council, who are not serving public officers, are appointed to hold office for a period
- of four years from the date of their appointment and are eligible for re-appointment.
- The composition of the Council is as follows:
- a Chairman;
- one representative of the Federal Ministry of Education;
- one representative of the National Universities Commission (NUC);
- one representative of the Federal Ministry of Science and Technology;
- one representative of the Nigerian Academy of Science;
- two representatives of the Nigerian Universities appointed in rotation for two years;
- one representative of the Polytechnic;
- one representative of the College of Education;
- three members to represent professional and other interests in Mathematics, Computer science,
- Statistics and Theoretical Physics; and
- The Director and Chief Executive of the Centre.

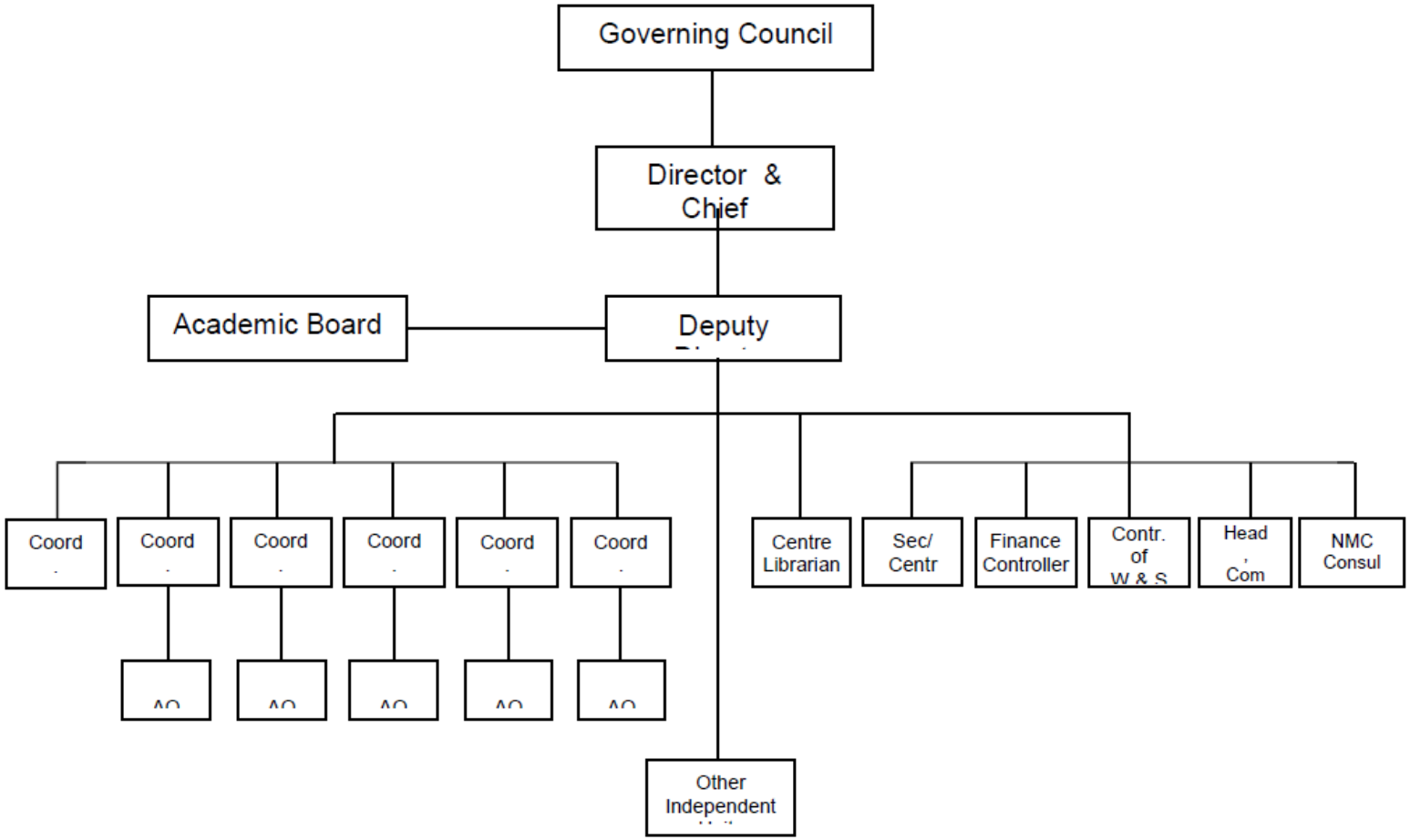
ACADEMIC BOARD

- The Academic Board of the Centre is charge with organization and control of lectures and tutorials, symposia, workshops, conferences etc. in the subject areas of Mathematics, Statistics, Computer Science , Science, Theoretical Physics and Mathematical Science Education. The broad subject area of Mathematics i.e. Algebra , Geometry, General and Global Analysis ,Topology, Approximation Theory, Computational and Applied Mathematics, Mathematical Modelling ,Operation research, Systems and Control Theory etc.; shall be given due attention. Similar attention are devoted to the usual key subject areas of the other
- Programmes. Its responsibilities also include the admission and discipline of participants who are admitted into the Centre to receive one course of instruction or the other.
- The Membership of the academic board, as stated in part IV, section 10 of Decree No. 40 of 1989,

Academic Board

- comprises: the Director and Chief Executive of the centre as its Chairman, the Deputy Director, the Librarian, four representatives drawn in rotation from among the Universities in Nigeria in the discipline of Mathematical Sciences, and five other persons, for the time being holding such appointments on the Staff of the centre, as the Director of the Centre may, with the approval of the Council, specify.
- The Academic Board is also expected to formulate and continuously evaluate the academic programmes of the centre, and perform other functions as are traditional to such bodies as the Director who is the Chairman of the Academic Board meetings, the Deputy Director shall preside at such meetings.
- However, in the absence of both, the members present at any of such a meeting, shall appoint one of their members to preside.

Organizational Structure of NMC



Organizational Structure of NMC cont…

AO: *Activity Organizers*
TPP: *Theoretical Physics programme*
MP: *Mathematics programme*
CSP: *Computer Science Programme*
SP: *Statistics programme*
MSEP: *Mathematical Science Programme*
JDP: *Joint Degree programme*
***Others**: Mathematical Modelling and Olympiad Coordinating Programmes*

Present statistics of the Centre

Number of employees (200)

Number of Scientists

20 PhDs

58 M.Sc,

36 B.SC

Technical support staff 20

Capacity building programmes (conferences/training)

1. **NMC GRADUATE FOUNDATION SCHOOL**

- The NMC Graduate Foundation school is a 12 Week programme and **subjects covered were on:**
- Abstract Algebra, Linear Algebra, Geometry Topology, Real Analysis, Number Theory & Differential
- Equations.
- QUALIFICATION**:** BSc Degree in Mathematics, Physics, Computer Science with a minimum of 2nd Class (Upper Division)

2. **THE 8TH NATIONAL MATHEMATICS COMPETITION FOR UNIVERSITY STUDENTS**

- **(NAMCUS 2016)**
- The competition was held at the Researchers' Village, Nigeria Atomic Energy Commission, Sheda, Abuja from Sunday 03 April, 2016 to Friday 08 April, 2016.

3. OLYMPIAD 2016 FINAL TRAINING AND SELECTION

- The first and second stages of the mathematical Olympiad were held with students emerging to final. Final Training and selection was held on 25th March 2015 to choose the representative of Nigeria at the various Olympiad.

4. WORKSHOP ON ALGEBRA, FUND RAISING AND STRATEGIC PLANNING

- The National Mathematical Centre held a 2-day conference namely the UNESCO-NMC Inauguration of the UNESCO Chair Programme on mathematics at the National Mathematical Centre, Abuja and International Workshop on Mathematics (Algebra) ,Fundraising/Strategic Planning held between
- 12 – 13th January 2016.

WORKSHOP ON ALGEBRA, FUND RAISING AND STRATEGIC PLANNING

The workshop was held on 13th January 2016. Discussions were on Curriculum Development (Algebra) Networking and Partnerships continued in the first session.

The discussion was on other related Courses in the NUC Basic Minimum Academic Standard (BMAS).Subjects discussed include MTS 301 (Metric Space Topology), MTS 313 (Geometry),MTS 317 (Differential Geometry) and MTS 405 (General Topology).

- Presentations were made by representatives of Universities. Various issues were considered. It was noted that based on the National Universities Commission (NUC) minimum requirements, there are six compulsory courses in Algebra, and the data gathered by the National Mathematical Centre has revealed that many Universities in Nigeria do not have mathematicians who are Algebra Specialist. He further stated that in the next four years, the NMC is determined to produce undergraduates,
- Masters and PhD holders in Algebra. It has been noted that non Algebraists teaches Algebra in so many Universities in Nigeria and so the Centre through UNESCO intend to actualize this mission of training people in Algebra, hence the UNESCO Chair Programme on Mathematics at the National Mathematical Centre.

- The workshop was organized to look at the synopsis of the courses as prescribed by the NUC and find out whether it was adequate or not. The representative from UNESCO observed that dearth of experts in Mathematics existed, teaching initiatives were inadequate and students needed grants.
- These challenges necessitated the UNESCO Chair. She however recommended that the Department of Mathematics in Nigeria should send in their recommendations in terms of staff strength and funding to the NMC in order to address the problem.
- The last session of the day was fund mobilization, strategy and
- Budget. Suggestions and recommendations were made by representatives from UNESCO, Partner Institutions and Universities.

INAUGURATION OF THE UNESCO NMC CHAIR

- The Inauguration ceremony of the UNESCO Chair on Mathematics took place on 12th January 2016. During the Inauguration by Prof. A.R.T. Solarin, the Director & Chief Executive of NMC as UNESCO-NMC Chair Holder on Mathematics, an overview of the UNESCO-NMC Chair Programme was given by Mrs M. Anene-Maidoh, Secretary General Nigerian National Commission for UNESCO (NATCOM).
- Good will messages were delivered by representatives of NUC, UNESCO and Vice Chancellors of several Universities. The representative of the Honourable of Minister of Education read his address and on his behalf inaugurated the UNESCO Chair Programme on Mathematics at the National Mathematical Centre, Abuja. The Logo and banner of the Chair were thereafter unveiled by the representative of the Minister.

2015 NMC/ MDGS MENTAL ARITHMETIC AND MIP TRAINING

- The Centre organized a 2-week MDGS Mental Arithmetic and MIP Training workshop that held from the 7th to 18th December, 2015. This workshop took place simultaneously in three states of the federation namely Jigawa, Kano and Katsina States. In each Centre 240 students and 24 teachers were trained.
- The programme was divided into 2 sections, Mental Arithmetic which took place in the morning and Mathematics which held in the afternoon. The Mental Arithmetic training exposed participants to the use of the Chinese abacus to perform addition and subtraction. The Mathematics training season engaged Teachers and students on different methods of teaching and learning mathematics respectively with the use of teaching aids. In Jigawa state the training took place at Dutse International Model Secondary School, Shuwarin Express Way, Dutse. While in Kano the venue was Runfa College, BUK road, Kano.The venue for the training in Katsina state was Education Resource Centre Katsina.

7. INTERNATIONAL CONFERENCE ON MATHEMATICAL MODELING

- The National Mathematical Centre (NMC), Abuja in collaboration with the Commission on Science and Technology for Sustainable Development in the South (COMSATS), Islamic Educational, Scientific and Cultural Organization (ISESCO) organised the International Conference on Mathematical Modelling and the Second International Thematic Research on Mathematical Modelling meeting from
- 27 to 30 December 2015. **ITRG meeting** was held on 30th December 2015.Several papers were presented at the conference by Eminent scientists from Nigeria, Pakistan, Bangladesh, Jordan, Senegal and Morocco.

8 CAPACITY BUILDING WORKSHOP FOR MATHEMATICAL SCIENCES LECTURERS

- The Centre (NMC), Abuja organized a Capacity Building Workshop for Mathematical Sciences Lecturers In Tertiary Institutions on The Teaching of Mathematics and Statistics.
- The theme was “Improving the Capacity of Mathematical Sciences Lecturers on Teaching and Research”.
- The Workshop held between 21st October, 2015 and 25th October, 2015.
- The main objective of this workshop was to create opportunity for Lecturers of mathematical
- sciences in tertiary institutions to acquire more teaching skills through exposure to basic concepts and strategies for modern teaching.
- Other objectives of the workshop were to:
  (i) Identify basic principles of modern teaching in the Mathematical Sciences.
  (ii) Updating Lecturers with knowledge of basic concepts in Mathematics and Statistics at the tertiary levels
- and
  (iii) Improve their skills in carrying out research activities in the Mathematical Sciences.

9 INAUGURATION OF NMC-PUBLIC PRIVATE PARTNERSHIP (PPP) UNIT

- On 15th October, 2015 the National Mathematical Centre - Public Private Partnership (PPP) Unit was Inaugurated. The goal of the Public Private Partnership is to combine the best capabilities of the public and private sectors for mutual benefit. The Inauguration Ceremony which held at the Auditorium of the National Mathematical Centre was followed by series of lectures. The lectures included topics such as PPP Procurement Methodology, Establishment of PPP Units, Functions of PPP Units in MDA and 7 Essential conditions that define Public Private Partnerships.

- This event was organised jointly by the National Mathematical Centre Abuja and the University of Ibadan, Nigeria. The programme was held on 1-3 September 2015 at the University of Ibadan. This **specialist symposium** on mathematical and statistical finance brings together Nigerian and international academics**,** students and professionals, working on topics in financial mathematics, statistical finance, empirical finance, and financial engineering research, associated with financial markets, stock market
- Characterisation and development, economic policy and development. These topics are underpinned by macroeconomic, monetary and fiscal policies, and refracted on the lenses of emerging applications in **bank financial** management.

11 African Academy of Science (AAS) Pan-African Science Olympiads

FIRST AAS PAN-AFRICAN SCIENCE OLYMPIADS (PASO) TOOK PLACE AT ABUJA, NIGERIA BETWEEN AUGUST 23-28, 2015 UNDER THE AUSPICES OF THE AAS COMMISSION ON PAN-AFRICAN SCIENCE OLYMPIADS. THE OLYMPIADS WAS HOSTED BY THE NATIONAL MATHEMATICAL CENTRE, ABUJA, ON BEHALF OF THE FEDERAL MINISTRY OF EDUCATION AND THE NIGERIAN GOVERNMENT.

12 OLYMPIAD Examinations

- The first round of Olympiad examination was held in all state capitals of the Federation on the 27th of November, 2015.

13 A DAY OF AWARD OF 2,000 MEDALS

- The Centre (NMC) successfully organised a first of its kind event, a day when 2000 medals were awarded. This took place at the prestigious International Conference Centre Abuja on the Monday 20th July, 2015.The activities for the day were the 2015 National Rubik's Cube Championship Competition, the First National Olympiads Award for Secondary Schools and the Investiture of First Distinguished Fellow of NMC on Professor Sam Ale.
- The 2015 National Rubik's Cube Championship Competition was for Secondary Schools drawn from the 36 states of the Federation and Federal Capital Territory (FCT) Abuja. The FCT version of the competition took place earlier in June at NMC. During the National Olympiads Awards Ceremony for Secondary Schools, awards were given to the top 30 students in the competition. It should be noted that the NMC has been designated the organizers of Mathematics and Mathematical Sciences Olympiads in Nigeria. Nigeria has through the efforts of the Centre participated in the following Mathematics and Sciences Olympiads with encouraging success:-
- INTERNATIONAL MATHEMATICS OLYMPIADS (IMO),
- INTERNATIONAL OLYMPIADS IN INFORMATICS (IOI), INTERNATIONAL CHEMISTRY OLYMPIADS (IChO), INTERNATIONAL BIOLOGY OLYMPIADS (IBO), INTERNATIONAL PHYSICS OLYMPIADS (IPhO), and The PAN AFRICAN MATHEMATICS OLYMPIADS (PAMO), With the latest Pan-African Mathematics Olympiad for Girl (PAMO-G).
- Medals were also awarded to deserving students from the first round of the Cowbell Mathematics
- Competition (NASSMAC).

First Distinguished Meritorious service Award

- The First Distinguished Meritorious service Award of the National Mathematical Centre, Abuja was bestowed on Professor Sam O. Ale, mni, OFR, NPOM, FMAN. It was duly noted that the National Olympiads is the brain child of Professor Sam Ale, and thus the appropriateness of his receiving this prestigious at the occasion.
- The Director and Chief Executive of the National Mathematical Centre Abuja, Professor Adewale Solarin, in his welcome address mentioned the recent giant strides the Centre had taken in fulfilment of her Mandates.

Mental Arithmetic and establishment of Mathematics Laboratories

- One of the strategies is the reintroduction of Mental Arithmetic and establishment of Mathematics Laboratories in primary schools in Nigeria. This project he said was a result of a five-year research into the factors responsible for the recent domination of the world of mathematics by Chinese.
- The study revealed that the use of Chinese abacus by pupils from primary school was largely responsible for this China's level of achievement.
- The Director and Chief Executive of NMC named the major challenges facing the Olympiads as inadequate Funds and Training of contestants to meet international standard. He stated that the way forward was Gifted Education programme in each school and involvement of Nigerians in Diaspora.He specially acknowledged Promasidor, the Makers of Cowbell for support for PAMO; International Academy for the Gifted Ltd/Gte and Minerva University, USA. The event ended on good note.

14 ASS-AMU symposium

- The African Academy of Science(ASS) and the African Mathematics Union (AMU) symposium will be held on17th -20th May 2016.The theme of the symposium being ‘’Current Research Trends in Mathematical Sciences and Applications’’. This scientific activity will be jointly organised by ASS, AM , UNESCO Chair of Mathematics, National Mathematical Centre (NMC), Abuja Nigeria, UNESCO, Twinning and University Networking

15 1ST PASTOR E. A. ADEBOYE ENDOWED CHAIR ENRICHMENT TRAINING WORKSHOP IN APPLIED MATHEMATICS

- University of Lagos in Collaboration with National Mathematical Centre, Abuja is organizing the 1st Pastor E. A. Adeboye Endowed Chair Enrichment Training Workshop in Applied Mathematics. This is scheduled to hold from 5th to 11th June, 2016 with the theme 'Complex Fluid flows and it's Environmental Applications'.

3. Research programmes

3.1 M.sc Research projects on Financial Mathematics

- Twenty-seven (27) students have completed the M.sc Research projects and defended. The projects cover several areas of modelling in financial economics, Econometrics, modelling of behaviours of money and the financial markets. The University of Abuja will award degrees to the students who have successfully completed the M.sc programme.

3.2 Mathematical models for Pricing of electricity commodity in Nigeria

- The Research project on mathematical modelling for fair electricity tariff for electricity in Nigeria has been completed. Models for pricing, hedging, price sensitivity analysis and optimization of electricity have been developed. The need for the models was based on the request by the Nigerian Electricity Regulation Commission.
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3.3 Continuing programmes

3.3,1 NMC-RMRDC modelling Research on Raw material processing equipment

- The Raw Material Research and Development Council (RMRDC) realised that one of the major reasons why most raw material processing equipment tend to fail was because such equipment were not properly modelled before fabrication.
- Engineers need to model equipment, simulate the model to obtain adequate information on the operational characteristics of parameters of the equipment for effective and durability of the equipment. In view of this, RMRDC instituted a research grant on Mathematical modelling of Raw materials processing equipment which was domiciled in National Mathematical Centre (NMC). The RMRDC provided the funds and NMC oversees the grant. This grant is to complement project on design of Raw Materials processing equipment and the research will not be experimental but simulation in nature.

The expectations from the recipients of the award are:

- The project must be targeted towards Raw material processing equipment and to develop mathematical models/simulation that would determine the optimal operational characteristics (parameters) for the equipment.
- Use the models to predict the best way to operate the raw material processing equipment in order to optimize its performance and life expectancy of the equipment.
- Carry out additional investigation to identify other factors that may potentially affect the machine with the view to proffer solution using mathematical modelling techniques.

Quarterly, the awardee is expected to present seminars and send progress report of work to the project Manager.

Three awardees of NMC-RMRDC Research modelling grants:

S/NO	NAME
1.	Taiwo Ademiluyi Chemical/Petrochemical Engineering, Faculty of Engineering, Rivers State University of Science and Technology, Port Harcourt
2.	Nwankwojikme N. Bethrand Department of Mechanical Engineering, Michael Opera University, Nsukka
3.	Olufemi A. Koya Department of Mechanical Engineering, Obafemi Awolowo University (OAU), Ile-Ife

NMC-RMRDC modelling Research on Raw material processing equipment

The project completed and NMC-RMRDC has signed a Memorandum of Understanding (MoU) with National Mathematical Centre on new directions for the project.

PROJECT ON MATHEMATICAL MODELLING AND SIMULATION OF AIR AND WATER POLLUTION: EFFECTS AND REMEDIES

The project is being carried out by the COMSATS International Thematic Research group on Mathematical modelling under the leadership of Prof. B O Oyelami. The project is specifically designed to determine to what extent the pollution in air and water will have impact on agricultural production, human health and global ecology and economy of South-South including the possibility of substantial population displacement in the region. Come up with some effective models for predicting/ controlling pollution of air and water. Provide intellectual resources to the Environmentalists, Educationalists, Researchers, Students and field workers to understand the effects of air and water pollutions and possible ways of controlling pollutions. The second report of the group will be given/ delivered by the leader of group at this meeting.

3.1.3 National Thematic Research group on Mathematical modelling (NTRG)

The National Thematic Research group on mathematical modelling (NTRG) is working Mathematical modelling on climate change and environmental problems .We expect the group to report findings in the next stakeholders' meeting at NMC in November 2016

4. International Collaboration

Collaboration with international organisations and private sector

- National Mathematical has entered into partnership with Minerva University, United States of America. Minerva sent two Resource persons from the university ,Mrs Fatou Badiane –Toure and Dr.Rena Levit to train Olympiad /Pan-African Science Olympiad students and Trainers at a two day workshop held between 23rd and 23rd July 2015.
- NMC-COMSATS Collaboration led to formation of The COMSATS International Thematic Research group (ITRG) on Mathematical modelling .The group jointly organised the NMC-COMSATS International Conference on Mathematical modelling and simulation of climate problem which was held on the 1st December 2015.The inauguration of the COMSATS International Thematic Research Mathematical modelling group was on 2nd December 2014 and the second meeting of the group was held on 30th December 2015.

International Collaboration

- NMC-COMSATS-ISESCO Collaboration led to hosting of the International Conference on Mathematical modelling held in National Mathematical Centre Abuja 28th -29th December 2015. COMSATS-ISESCO provided the research grant to the ITRG working on the project: Mathematical modelling and Simulation of Air and Water Pollution: Effects and Remedies.
- UNESCO-NMC CHAIR on Mathematics (Algebra): The United Nations Education Scientific Cultural Organisation (UNESCO) approved the establishment of the UNESCO/UNITWIN chairs at the National Mathematical Centre, Abuja .The approval was conveyed by UNESCO in March 2015 and an Agreement was signed.
- African Academy of Science (ASS) and African Mathematics Union (AMU): NMC collaborated with ASS and AMU for purposes of hosting some scientific activities and competitions for young talented students in the Olympiads. NMC had successively hosted the first African Academy of Science Olympiads (PASO) in 2015 and had received the go ahead to host the NMC-ASS-AMU International Symposium on Current Research Trends in the Mathematical Sciences and its Applications come may, 2016.

International Collaboration

- NMC Diaspora Visiting Scientists programme: This programme allows Nigerians and Africans scientists to visit Centre for under three or six months. The NMC would pay them salary for the period. The programme was such that whenever they were on sabbatical they would be in Nigeria. The current President of the African Academy of Science, Professor Kuku had been benefiting from the programme.

National Collaborations

- National Collaborations: NMC has collaboration with many Nigerian Universities and the National Universities Commission (NUC) on Science, Technology and Mathematics. The Centre also collaborated with several Research Centres under Ministry of Science technology; Ministries of Aviation and Water Resources etc. Here some of Centres:
- The Raw Material Research and Development Council (RMRDC) with research on modelling of Raw material processing equipment.
- National Atomic Energy Commission, Abuja, Nigeria provision of facilities for hosting some of scientific events.
- National Space Research and Development Agency (NASRDA), Abuja, Nigeria with mathematical modelling research involving satellite imaging system and environmental data.
- Nigerian Communication Satellite limited (NIGCOSAT),Abuja, Nigeria
- Nigerian Meteorological Agency (NIMET), Abuja, Nigeria on Mathematical modelling Research related climate change.

National Collaborations

- Nigeria Water Research Institute Kaduna on Mathematical modelling Research related water.
- National Electricity Regulation Commission on Mathematical modelling Research related to electricity pricing, hedging and optimization of electricity transmission and usage.
- National Health Insurance on Mathematical modelling Research related to financing of health and medical related problems.

5. Commercialization/ patent of research

The National Mathematical Centre is intensifying development of more new mathematical kits and Whiz teachers' software .Patenting and commercialization of these two projects are being undertaken of processed by the NMC global Consult, the commercial unit of NMC.

NEWSLETTER & PUBLICATIONS

- The Nigeria Mathematician quarterly magazine of the National Mathematical Centre, Vol.001, No.005, was published in December 2015.
- Brief on National Mathematical Centre, Nigeria was published together with the NMC books and Proceedings 2015.
- The Vol.5 of NMC Mathematical Sciences Journal published in 2015 and Vol.6, 2016 in the press.
- The Vol.5 of NMC Mathematical Sciences Education Journal published 2015 Vol.5 and Vol.6, 2016 in the press.

FUTURE PLANS

- To fulfil our vision to become a world class Centre of Excellence for Research and Teaching in the Mathematical Sciences.
- To simulate the state of Nigeria economy so as to boost it via diversification of the economy.
- How to improve generation, transmission and distribution of electricity in Nigeria.
- How to solve energy crisis in Nigeria and to maximize the use of renewable energy in Nigeria.
- Improve Teaching and Learning in Mathematical Science in Nigeria
- Our hope is to enlarge our coast by developing the girl child's interest in Mathematics, at the African continental level.

FUTURE PLANS

- Have in house the best simulation laboratory with supercomputer facility.
- To make Mathematical modelling and Simulation a household name in Africa. Being one of the most Excellent Centres for Mathematical modelling and Simulation in the world.
- To consolidate our collaboration drive by extending our tentacles to more organisation and to improve our revenue.
- To make meaningful impact in Research and Development in the south-south by working in cohesive and aggressively with other Centres of Excellence in COMSATS.

Acknowledgements

- The Director and CEO of National Mathematical Centre (NMC) Professor A.R.T. Solarin and the Management Staff of NMC hereby acknowledge the support and cooperation we received from following organizations which made the hosting of the events successful:
- Federal Ministry of Education, Nigeria
- Commission for Science and Technology in the South (COMSATS) Pakistan
- Islamic Education and Scientific and Cultural Organization (ISESCO) Morocco
- National University Commission (NUC) Abuja, Nigeria
- National Atomic Energy Commission, Abuja, Nigeria
- National Space Research and Development Agency(NASRDA),Abuja, Nigeria
- Nigerian Communication Satellite limited(NIGCOSAT),Abuja, Nigeria
- Nigerian Meteorological Agency (NIMET) ,Abuja, Nigeria