TAASnews

Newsletter of the Tanzania Academy of Sciences Vol 2 No 2: July 2013

110 New Members Inducted

TAASnews

This is the newsletter of the Tanzania Academy of Sciences. It is designed to serve as a vehicle for informing members, stakeholders and the public in general about the activities of the Academy and its impact on society in line with its primary mission. It is published twice a year, but depending on circumstances and needs, special editions may be published.

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Editorial

Dear readers, we are pleased to bring you the latest issue of TAASNews. This issue focuses on 7th February 2013 - the date that has already engraved a niche in the annals of history of TAAS. It was a day of celebration. A day dedicated for inducting 110 new members to the Academy.

Undoubtedly, the induction has catapulted TAAS to new great heights, for the new members constitute a rich mix of brains and professionals. The new members are learned individuals in myriad fields of specialism. TAAS now boasts of educationists, biologists, chemists, physicists, physiologists, biochemists, anatomists, physicians, nutritionists, agriculturists, veterinarians, surgeons, parasitologists, mathematicians, engineers, geologists, geographers, artists, lawyers and economists - to mention a few.

With all these talents, we can confidently say, TAAS is now stronger than hitherto, and is poised to make a mark on the key pillars of the national agenda. The fundamental role of TAAS is to harness these talents to critically examine the national agenda and propose science-based solutions. We are happy that their commitment to the national cause is unquestionable.

The areas that require our attention are many. But who can deny the fact that some sectors seem to stand out more conspicuously, particularly by looking at their negative impacts on the lives of majority of our people. That is why we have the audacity to say:

- Let us look critically across our entire education spectrum and the way we manage it!
- Let us look at our infrastructure and economic support systems.
- Let us look at our environment, which is being destroyed at an alarming rate.
- Let us look at the way we govern ourselves to address our socio-economical woes.
- Let us look at the way we grow our food and feed ourselves.
- Let us look at the way we manage our natural resources.

Certainly, we need better solutions in all these areas to enable our people lead more dignified lives. But of these six areas, education needs a very special attention. Special attention on education across all levels is a sine qua non for addressing the dwindling trend of ethical values and moral decadence across our society.

Let us invest adequately in education to produce the best human capital that is capable of turning around our state of poverty to blossom into prosperity and peace. Nobody has ever put it better than Mwalimu Julius Kambarage Nyerere, on Man and Development. He said:

"*The purpose of development is man. It is the creation of conditions, both material and spiritual, which enable man the individual, and man the species, to become his best.*"

Our education system must be energized to do the best, to get the best, and to deliver the best to society. On this point, Dear readers, I leave you with a word of wisdom from one of the all time greatest philosophers – and this is none other than Aristotle, who put it best when he said,

"*The roots of education are bitter, but the fruit is sweet.*"

Lastly, as I said before, this issue focuses on the induction ceremony. Therefore, we present the concerns, perspectives, distilled wisdom, and pictorial images of the distinguished figures who coloured the event. Enjoy the reading.

Ludovick D B Kinabo, June 2013

Welcome

Speech by Prof. Esther Mwaikambo, President of Tanzania Academy of Sciences

- *Hon. Guest of Honor - Prof. Matthew Luhanga, founding President of the Tanzania Academy of Sciences;*
- *Hon. Prof. Keto Mshigeni, former Secretary General, TAAS;*
- *Foreign Secretary of the Royal Society, Prof. Martyn Poliakoff;*
- *Mr. Carmine Lee Novembre, from Pfizer;*
- *Ms. Ruth Cooper, Senior Policy Officer, Royal Society;*
- *NASAC representative;*
- *Founding fellows of the Academy;*
- *Newly elected Fellows and other members of the Academy;*
- *Invited guests, Ladies and Gentlemen.*

It gives me a great pleasure to welcome you all to this long awaited historic and highly significant event to us in the Academy - the Induction of the newly elected fellows and members of the Tanzania Academy of Sciences (TAAS).

I am especially grateful to you, Prof. Luhanga, the founding President of TAAS for accepting to grace our ceremony.

We are particularly pleased to have among us visitors who have travelled from far to be with us today at this ceremony. These are: Prof. Martyn Poliakoff, Foreign Secretary, and Ms. Ruth Cooper Senior Policy Advisor from the Royal Society in the UK and Mr. Carmine Lee Novembre who has travelled all the way from the US to participate at this event. On behalf of the Academy, I would like to welcome you specifically to Dar es Salaam and Tanzania in general. Thank you for accepting our invitation. Our international visitors will have an opportunity to introduce themselves to the participants when they give their talks.

I would like to welcome the founding fellows and the fellows and members of TAAS waiting to be inducted today. We thank all the invited guests for taking time out of their busy schedules to be here today to witness the induction of the TAAS new fellows.

TAAS was founded eight year ago when twenty five senior Tanzanian scientists met and decided to form TAAS. The main driving force behind this initiative was Hon. Prof. Peter Msolla.

TAAS is a learned, independent, non-for profit scientific organization which was established on 24th February 2004 and inaugurated and officially launched on 24th June 2005, in Dodoma, by the then President of the United Republic of Tanzania, H.E Benjamin William Mkapa.

The academy is currently hosted by the National Commission for Science and Technology where we are today.

The mission of the academy is to promote scientific and technological learning and the utilization of scientific and technological knowledge for national socio-economic development.

The principles of TAAS are:

- nurture scientific knowledge and innovation in order to improve and enhance the contribution of science in the everyday activities of a Tanzanian.
- offer quality scientific services with integrity.
- work with efficiency to ensure optimal utilization of resources in generating valuable longer term outcomes and impacts.

The major goals of TAAS are promotion, advancement and application of Science and Technology for socio–economic development of Tanzania, and provision of quality, neutral policy and strategic advice. In addition, TAAS is a platform for evidence- based opinion exchange among stakeholders and for provision of realistic science based policy responses and home grown solutions that are in line with current and future national aspirations and needs. The functions of TAAS include to:

- Promote knowledge creation and innovation in scientific and socio-economic fields;
- Advise and provide policy and strategic advice on science, technology and innovation (STI) to the society;
- Support and facilitate high quality scientific research and its applications by availing competitive research grants and promotion of research projects;
- Promote dissemination and exchange of scientific knowledge through learned journals, meetings, conferences, seminars and lectures;
- Promote science education through improvement of the national science education policy, content, and standards, quality of science curriculum and science teachers;
- Facilitate value adding linkages and collaborations with scientific communities within the country and abroad through exchange programs and fellowships for training and research.

TAAS has been guided by five year strategic plans. In 2012 the academy developed a second five year strategic plan. The TAAS strategic priorities for the next five years are designed to increase interest and incentivise use of science in the society through promotion of science education in kindergarten, primary and secondary schools. In this case, together

with other stakeholders, we are devising a project to develop and disseminate two illustrated Kiswahili Science Dictionaries for Primary and Secondary Schools in Tanzania.

The intended outcomes are to:

- reduce the communication barrier between teachers and students which is hampering studying of science in Tanzania.
- raise the reception and improve understanding of science among school children and the society.
- ease the adoption, adaptation, and use of scientific knowledge and applications in poverty reduction efforts and wealth creation at homestead level- particularly in the areas of agriculture and health.

Other strategic priorities for the next five years are:

- Dissemination of information and applied tacit knowledge on science and technology in rural communities in Kiswahili.

- Gender mainstreaming and development of girls in science and technology related fields in Tanzania.

- Capacity building of scientists and enhancing their skills, expertise, and experience through multilateral linkages, training collaborations and long-term research and skills transfer exchanges.

- Conducting independent research and open public lectures on policy and strategic issues that are important for national socio-economic development to mention just a few.

Despite the formidable challenges that TAAS has faced in this start-up phase, TAAS has made some notable achievements. Examples are:

- In collaboration with The Royal Society and The Network of African Science Academies we have made available about TSh 2.0 billion from the Leverhulme Foundation to facilitate collaborative research projects between Tanzanian, UK and Ghanaian scientists.

- In collaboration with Royal Society- Pfizer African Academies Programme, TAAS has held several capacity building activities including workshops on: Engaging and influencing government and decision makers; Deliberating on the agricultural research strategy in support of Kilimo Kwanza; and the Implications of Climate Change to Sustainable Agriculture and Health.
- Provided opportunities for young scientists in Tanzania to participate in international competitive opportunities which have so far yielded two winners – one engineer winning a Microsoft Award and a physician winning a young physician award from the Global Network of Science Academies.

- With support from NASAC, Royal Society, Pfizer, and UNESCO, and positive response from our scientists, TAAS has successfully published a book titled "**LIGHTING A FIRE -** Volume one. I", authored by 31 highly successful Tanzanian scientists. The book was launched by Hon. Prime Minister, Mizengo Kayanza Pinda, on August 2, 2012. This book is on the shelf here and people may wish to acquire themselves a copy. LIGHTING A FIRE Part II is in the pipeline.

The Government of Tanzania has provided Offices for TAAS, and some resources for basic operations which include holding valuable workshops such as the one held three weeks ago on "**The Deliberations on Science, Technology and Innovation Inputs to the Tanzania Constitution Reform."**

On behalf of the Academy, I would like to thank all our stakeholders, supporters and collaborators as well as all those who have contributed towards the advancement of TAAS. Special thanks must go to the Government of the United Republic of Tanzania, Tanzania Commission for

Science and Technology, and the Royal Society-Pfizer Program UK for providing resources to support today's induction event.

I wish to welcome into the academy the new fellows and members to be inducted today.

We invite the inductees and all national and international science stakeholders to work with TAAS and Tanzania towards facilitating the increased contribution of science in Tanzania's sustainable development.

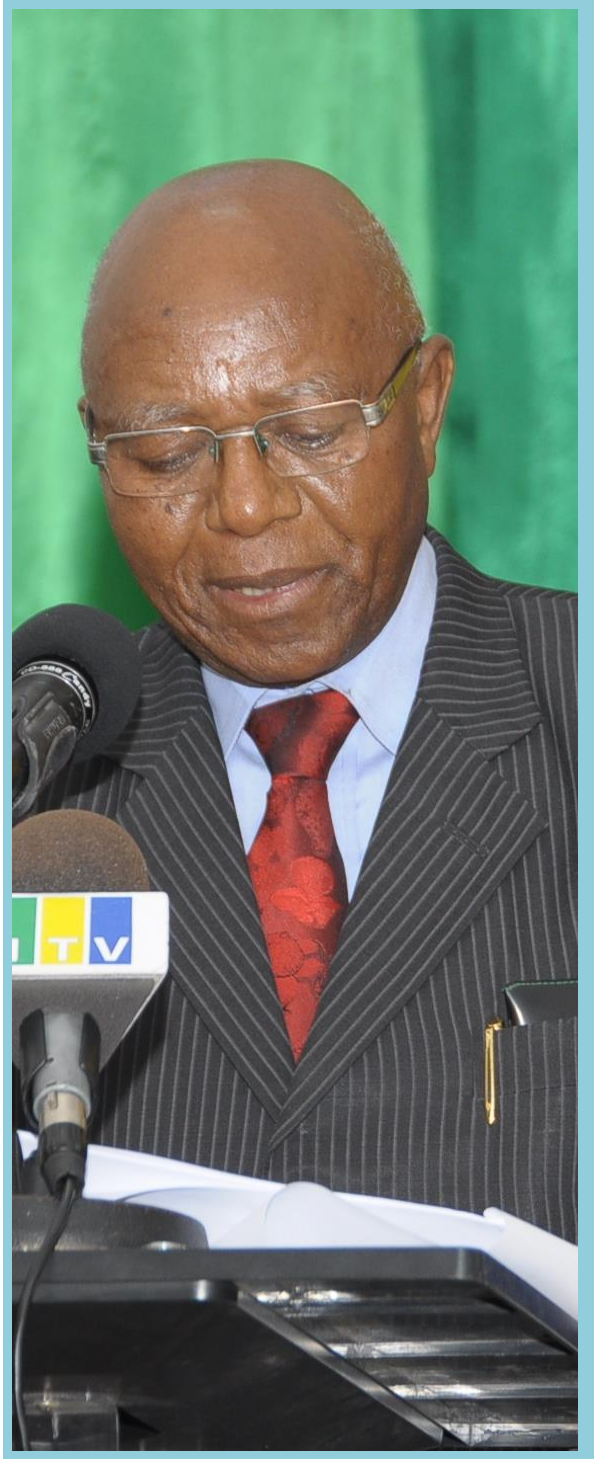
Thank you for your attention.

Prof. Esther D. Mwaikambo
President, TAAS
7 February 2013.

We invite the inductees and all national and international science stakeholders to work with TAAS and Tanzania towards facilitating the increased contribution of science in Tanzania's sustainable development.

About the Induction

By Keto E. Mshigeni
Immediate Past Secretary General of TAAS
(ketomshigeni@gmail.com)



Salutations

- *Distinguished President of the Tanzania Academy of Sciences (TAAS), Prof. Esther Mwaikambo;*
- *Distinguished Immediate Past President of TAAS, and our Guest of Honour, Prof. Matthew Luhanga;*
- *Distinguished Invited Guests from overseas: Mr. Carmine Lee, and Prof. Poliakoff Martyn;*
- *Distinguished Secretary General of TAAS, Dr. Gratian Bamwenda;*
- *Distinguished Founding Fellows of TAAS here present;*
- *Distinguished Elected NEW Members and Fellows of TAAS here present;*
- *Distinguished audience, Members of the media, Ladies and Gentlemen.*

Introduction

It is with great joy and pride that today we are able to conduct this significant, historic, and gratifying event: the INDUCTION of our new Fellows of the Tanzania Academy of Sciences.

The work that preceded this important event involved a process of nominations by peers. It involved extensive and intensive consultations. And it involved also elements of intrusiveness: encroaching into busy schedules of the nominees, requesting them to update

their CV's and to submit them to the Academy's Secretariat for distillation and analysis. But we did not stop there. We requested them also, to submit half-page summaries of their CV's, and passport-size photographs.

The process required broad-mindedness. It called for a good understanding of the word 'science', which is derived from the Latin word, '*scientia'*, that means knowledge. Since 'knowledge' is devoid of borders, an element of inclusiveness was considered, in order to embrace, not only fields of natural-, agricultural-, engineering-, and medical sciences, but also the social-, humanities-, and related sciences.

The process also called for a good understanding of the word 'academy': its meaning, and its exclusiveness, in terms of inviting only the scholarly and learned individuals, who have demonstrated standards of excellence in their respective fields of study.

The process required significant time inputs from individuals who are already very busy, and who undertake various TAAS activities as missionaries, on a voluntary basis, in their spare times (during evenings and week-ends). Actually, it took us several years of searching. We are therefore exceedingly delighted that we are where we are today, a day in which we shall induct 110 new Fellows to join the Academy.

But we know that there are many other good Tanzanian scientists, some of them in the Diaspora, who are yet to be identified and to be nominated for election. Those of you being inducted today will be expected to play a dynamic role in nominating other excelling scientists for election as TAAS Fellows.

Induction

The induction of Elected new Fellows into respective academies, is a tradition adopted from older academies, such as TWAS (the World Academy of Sciences, based in Trieste, Italy), and AAS (the African Academy of Sciences, based in Nairobi).

The induction of Fellows is an initiation ceremony, an installation event, a formal announcement, and a public declaration, that a given scholar's academic and professional standing, in terms of research and publication, and in terms of academic ethics and integrity, in his/her chosen field of study, has been assessed by peers, and found to be of merit, and of distinction.

Yes, being elected a Fellow of an Academy such as TAAS is a significant honour, and a great achievement, to the scholar being inducted, and also to the Academy, in terms of strengthening the organization, with some of the best and sharpest minds in our nation.

Normally, during the induction of Fellows, a half-page citation of the Fellow's scientific and scholarly achievements is read in public: to say it *loudly* and *proudly*, that the scholar's election was meritorious. But because of shortage of time, today we shall not read the citations: we shall only mention the scholar's field of expertise, and the institutions where they are based, as they come forward, to be presented with their Certificates as new Fellows of TAAS.

But let me take this opportunity (on behalf of TAAS) to announce that, in a matter of a few months, through each new Fellow's full involvement, all the citations summarizing each Fellow's Profile, contact particulars, and containing his/her passport-size photograph, will be published into a booklet, that will be made available to the public.

Dear new Fellows, following your induction, you will be entitled to use the acronym *FTAAS* after your name (e.g., Hassan, PhD, FTAAS). You will be provided with a copy of the TAAS Constitution, the TAAS Strategic Plan, and copies of various TAAS publications. And, you will be expected to play a dynamic role in

fulfilling the vision, the mission, and the objectives of the Academy.

Last year our Academy published a historic book titled, *LIGHTING A FIRE: Inspiring Stories of 31 Eminent Tanzania Scientists, Volume 1*.

You are encouraged to secure a copy of the book, and to synthesize a story on your own scientific journey: from primary school to your current standing, for publication in Volume 2 of the book series, which will be expected to inspire our youth towards following your foot-steps.

To all the Fellows who will be inducted today, heartiest CONGRATULATIONS!

Director of Ceremonies, Distinguished Guests, Dear Fellows, Friends, Ladies and Gentlemen: I THANK YOU for your kind attention.

... being elected a Fellow of an Academy such as TAAS, is a significant honour, and a great achievement, to the scholar being inducted, and also to the Academy, in terms of strengthening the organization, with some of the best and sharpest minds in our nation

From Pfizer

Involment in Developing Countries in Africa

Lessons Learnt

by

Mr Carmine Novembre

Jambo!

Thank you to the Tanzania Academy of Sciences for inviting me to be a part of the induction of Fellows ceremony– I'm so pleased to be here in beautiful Tanzania with Professors Esther Mwaikambo, Matthew Luhanga, and with all of you.

Pfizer is also committed to building the research capacity in Africa by pairing promising new investigators with established researchers from North America and Europe, and through mentoring arrangements and Fellowships.

By investing in the education and training of African researchers, we believe the answers to the challenges in healthcare delivery in Africa will be found right here at home.

At Pfizer we are committed to public-private partnerships that address public health issues affecting communities, in line with our mission of working together for a healthier world.

We recognize the health challenges facing many Africans and have looked to invest significant resources to ensure that more Africans receive better care and have access to critical medical services.

As part of this commitment and in response to the surging global HIV/AIDS crisis, in 2000, we launched the Diflucan Partnership Program as a public-private partnership designed to improve the quality of life for people living with HIV and AIDS as well as save lives.

Through the program, Pfizer and its committed partners have distributed millions of Diflucan (fluconazole) treatments for two HIV/AIDS-related fungal infections — cryptococcal meningitis and esophageal candidiasis — free of charge to government and nongovernmental organizations (NGOs).

The program has provided more than US $1.3 billion in medicine to more than 2,600 sites in 63 countries in Africa, Asia, the Caribbean and Latin America where HIV/AIDS is endemic.

In Tanzania, Pfizer worked with the Tanzania Ministry of Health for eight years to provide Diflucan to patients, distributing over 70,000 bottles of medicine and overall, more than 20,000 health professionals have been trained in the diagnosis and treatment of fungal opportunistic infections around the globe.

With each expansion of the program, we've looked to continuously improve processes and break down barriers to access for those patients most in need

In 2003, Pfizer launched the Global Health Fellows Program as an international corporate volunteer program that places Pfizer colleagues and teams in short term assignments with leading international development organizations.

During assignments, Fellows transfer their professional medical and business expertise in ways that promote access, quality and efficiency of health services for people in greatest need. To-date, 20 Pfizer Fellows have been deployed for work throughout Tanzania, and the program continues.

In 2004, Pfizer also established the Infectious Diseases Institute in Kampala, Uganda as a regional centre of excellence for prevention, treatment, training and research that strengthens regional capacity in HIV/AIDS, malaria and tuberculosis – some of the biggest health challenges facing Africans today.

The Infectious Diseases Institute has since trained over 8,500 healthcare providers from 27 African countries and provided care and treatment to some 40,000 patients and outreach to an additional 500,000.

In addition, the Institute includes award-winning laboratory, one of very few College of American Pathologists accredited research facilities in Africa, and enables the Institute to conduct the majority of its research projects on-site, right in Uganda.

The research taking place there is rife, with 111 research publications, 147 abstracts and 15 research projects under way to-date, all aimed at improving regional healthcare policy and practice and developing new generation of independent African researchers.

And right here in Tanzania, Pfizer is currently working with the Minister of Health's Office to reduce the prevalence of blinding trachoma through consistent application of the SAFE strategy, with the goal of eliminating blinding trachoma by 2020.

This includes the distribution of Pfizer's Zithromax to 31 districts in Tanzania through mass drug administration conducted by the International Trachoma Initiative partners IMA/USAID and Sight-savers.

Over several years, we have been proud to support the educational exchange program between Weill Cornell Medical College and New York Presbyterian Hospital (NYPH) in the US, and Weill Bugando in Tanzania.

The goal of this exchange is to match Weill Cornell departments with Weill Bugando/BMC departments – clinical residents from Weill Cornell Medical College and New York Presbyterian Hospital provide hands-on training on the wards for the Weill Bugando medical

students, interns, and residents; senior faculty from both institutions work together on curriculum development.

In 2008 alone, approximately 30 Weill Cornell Medical College and New York Presbyterian Hospital clinical residents visited Bugando to teach on the wards and conduct tutorials in internal medicine, pediatrics, obstetrics and gynaecology, ophthalmology, psychiatry, and surgery.

The program has proven to be mutually beneficial in driving interest, setting new training procedures and improving the outcomes of patients.

In addition, Pfizer supports the Royal Society Pfizer African Academies Program – an important ongoing initiative that provides training, mentoring and project support to develop and strengthen national science academies in Ghana, Tanzania and Ethiopia in partnership with Network of African Science Academies (NASAC).

The Tanzania Academy of Sciences is one of its most notable achievements and focuses on an overarching strategy for agricultural research in addition to supporting international and national workshops, a science journalism prize, staff training events and roundtables on specific science sectors.

Pfizer has supported the Tanzania Academy of Sciences through the Royal Society Pfizer African Academies Program for 5 years.

We are very proud of this program and the progress it has helped to drive right here in Tanzania.

We hope that you all view Pfizer as a partner in the ongoing journey to improve health outcomes for Africans and we look forward to continuing to support and invest in these important programs, as well explore new programming that addresses the unmet health needs of Africans.

We have learned many very valuable lessons along the way and we continue to invest this knowledge back into new programming and resourcing.

Thank you again to the Tanzania Academy of Sciences for your tireless efforts in training these Fellows and for all that you do – it's an invaluable program that has a tremendous impact on global health and we are proud to be affiliated with you all.

I'd like to take this opportunity to congratulate you all upon your induction into the Fellowship and urge you to continue applying your scientific knowledge and research findings toward addressing the health needs of your communities.

We are all very proud of your accomplishments and know that you will do great things in the future.

I'm very excited to meet all of you and I hope there will be an opportunity to talk about some of your specific interests and research.

Asante! Thank you again for having me and congratulations on your achievement.

HIGHLIGHTS

The Role of a National Science Academy

Experiences of
THE ROYAL SOCIETY

By

Professor Poliakoff Martyn
FOREIGN SECRETARY

Prof Martyn Poliakoff – Foreign Secretary and Vice President of the Royal Society (RS) represented RS on the occasion. With great enthusiasm and charm, Martyn made a very inspiring presentation.

He spoke of his induction to the Fellowship at the Royal Society, at which he was told that the Society came first and if he was ever asked to do anything for it, he should just say yes! You cannot say no! His presentation was received warmly and generated many insightful questions.

When the certificates were presented, he spoke to each of the new Fellows individually, and reminded everyone to "never say no", which they readily agreed to. He jokingly suggested this could be an informal motto of the Academy! He expressed optimism that the induction ceremony will develop over the years and urged Fellows to play their role in advancing the important work of the Academy.

His presentation touched on many important areas, including:

- A brief history of the Royal Society which was founded in 1660 and makes it to be the oldest academy of science in the world;
- His role as Foreign Secretary of the Society;
- The importance of never saying no to the Academy;
- Global challenges, such as, climate change, natural disasters, energy, food and water security, rising commodity prices and scarcity of raw materials;
- His work on green chemistry which focuses on cleaner approaches to making chemicals and materials;
- The role of UK academies and the importance of international collaboration;
- The RS-Pfizer programme and its objectives;
- The science policy work of the RS.

Among the key roles of RS that he cited as examples are:

- To nurture future leadership in research through assorted schemes and funding modalities, and
- To undertake specific strategic actions, such as:
  - engaging more in Europe and with emerging economies,
  - building capacity in Africa;
  - promoting international mobility and connections,
  - working in partnerships on global challenges and
  - providing independent advice to policy makers.

He posed many challenging questions including those pertaining to:

- Use of science for negative reasons;
- Relating to other academies in UK;
- Combining academy work and employers work, in his case - RS work and work at Nottingham University;
- Postdoctoral challenges;
- Developing successful science policy.

Prof. Martyn Poliakoff presenting a plug to Prof. Esther Mwaikambo

Speech by Guest of Honour

Professor Mathew Luhanga

Founding President of The Tanzania Academy of Sciences

- *Prof. Esther Mwaikambo, President of the Tanzania Academy of Sciences;*
- *Prof. Poliakoff Martyn, Foreign Secretary Royal Society;*
- *Mr. Carmine Lee Novembre, Pfizer Inc., New York;*
- *Fellows of the Academy;*
- *Invited Guests;*
- *Ladies and Gentlemen.*

I would like to thank the President of Tanzania Academy of Sciences for inviting me to be the Guest of Honour at this special event of inducting new Fellows and Members into the Academy's ranks. I would like also to congratulate the new Fellows and Members on their election to join the Academy.

The importance of science, technology and innovation (STI) to national socio-economic development has been a well established fact for centuries. The recognition of this importance has led developed and developing countries to put more emphasis in use of STI. It has also been realized that despite museums of science, universities and research organizations, a gap still existed which, if not filled, would prevent the full exploitation of the potential of science for development. The gap could be filled by the establishment of national academies of sciences. That is why many economically successful countries have established national academies of sciences

which act as a catalyst for utilization of science leading to industrial development.

Invited Guests, Ladies and Gentlemen. For many years only a few developing countries had academies of sciences. This motivated the Third World Academy of Sciences (TWAS) – now known as The Academy of Sciences for the Developing World – to be established in 1983 under the leadership of the late Nobel Laureate Prof. Abdus Salam of Pakistan in collaboration with a group of distinguished scientists who were determined to do something about the dismal state of scientific research in developing countries. Some of the reasons given for the establishment of TWAS were:

- Although developing countries accounted for 80% of the world's population, only 28% of the world's scientists hailed from these countries. This fact reflects the lack of innovative potential necessary to solve real-life problems affecting poor nations.
- A chronic lack of funds for research often forces scientists in developing countries into intellectual isolation, jeopardizing their careers, their institutions and, ultimately, their nations.
- Scientists in developing countries tend to be poorly paid and gain little respect for their work because the role that scientific research can play in development efforts is underestimated. This in turn leads to brain drain in favour of the North that further impoverishes the South.
- Research institutions and universities in the South are under-funded, forcing scientists to work in difficult conditions and often with outdated equipment.

The efforts of Prof. Abdus Salam, and other scientists like him, showed the need for scientists to come together at national and international level to encourage utilization of science for development. Tanzania scientists decided to follow this good practice by creating the Tanzania Academy of Sciences.

Ladies and Gentlemen, in Tanzania the low level of industrialization is fuelled by low technological readiness, inadequate industrial innovation and poor quality of higher (tertiary) education. In the 2011 – 2012 Global Competitive Report, Tanzania was 126th in technological readiness, 73th in innovation competitiveness and 131st in quality of higher education out of the 142 countries assessed.

A look at education in Tanzania paints the kind of picture the country has to redress and thus a challenge to the Academy as well. One of the factors contributing to shortage of engineering, medical, other science and technology skills in the country lies in the poor quality of primary and secondary school education in Tanzania and even in SADC and EAC regions. The poor quality of science and mathematics education leads to a poor foundation on which to build the scientific skill needed in Tanzania. Statistics on the poor quality of science in African countries are illuminating. From the 2011 - 12 Global Competitive report out of 142 countries assessed globally Lesotho (107th), Angola (142nd), Namibia (111th), Madagascar (120th), Malawi (115th), South Africa (127th), Burundi (138th) and Tanzania (104th) were amongst the worst 40 countries in the quality of primary school education ranking. In quality of math and science education in primary and secondary schools in the same study Swaziland (110th), Lesotho (112th), Angola (142nd), Namibia (121st), South Africa (138th), Burundi (122nd), Uganda (101) and Tanzania (119th) were amongst the worst 42 countries out of 142 countries surveyed.

In the Human Development Report 2011 done by UNDP, the gross enrolment compared to the age group for primary school students in Tanzania was 104.9% for years 2001 – 2010. The pupil/teacher ratio was 53.7:1. The same figures for Kenya were 112.7% and 46.8:1 while in Uganda they were 121.6% and 49.3:1. While in Tanzania, only 27.4% of the primary students got to secondary school in the year 2001 – 2010, in Sub-Sahara Africa (SSA) the figure was 35.3%. Despite having the first President Mwalimu Julius Kambarage Nyerere being credited for the philosophy of Education for Self Reliance, one asks as to what one is teaching the majority of standard 7 students to be. The issue of curriculum, availability of

quality teachers, adequacy and quality of infrastructure and other resources are at stake here in order to enhance their performance in society after leaving school.

Invited Guests, Ladies and Gentlemen, the position of tertiary education sector is no better. The percentage of the age cohort at tertiary level education in years 2000 – 2010 in Tanzania was 1.4% when compared to Kenya (4.1%), Uganda (4.1%) and in Ruanda (4.8%). This percentage in African countries South of Sahara (SSA) was 5.9% while East Asia and the Pacific countries it was 24.9%. The situation here is indicative of the very low investment in the sector.

Ladies and Gentlemen, the gross statistics on education at all levels have shown how deplorable the situation in Africa is. The situation in the sciences and in science-based disciplines is even worse. This is unacceptable in the twenty first century – a century which will be science-led, innovation-enabled and technology-driven.

Ladies and Gentlemen, Tanzania Academy of Sciences was created as a response to the deplorable condition of science and scientists in Tanzania. It was established to promote cooperation and collaboration with the government, other scientific organizations, the private sector and the general public in ensuring that excellence in science is attained in schools, universities and research institutions and that the best science is harnessed for the development of Tanzania.

It is expected that like other national academies of sciences worldwide, the Tanzania Academy of Sciences will play a central role in guiding, teaching, training and research in science and providing evidence-based practical scientific solutions to problems hindering development. It will serve as a catalyst for harnessing science, technology and innovation as engines for socio – economic transformation of society and the general improvement of the living and working conditions of Tanzanians in line with the aspirations of Tanzania's Vision 2020.

I will like to remind the new Fellows that they have been elected to TAAS which is a merit-based academy. Only scientists with distinguished, internationally recognized outputs in science and technology are elected into its membership. Fellows of the Academy are, therefore, expected to uphold the TAAS objectives and obligations. Specifically are expected to support TAAS to reach its vision. TAAS aims to:

- Recognize individual scientific achievement
- Promote and encourage excellence in science and technology
- Provide independent, evidence-based policy advice
- Promote collaboration between Tanzanian scientists and distinguished scientists in other countries by forming links with other science academies

I would like to wish all the new members the best in their future scientific endeavours in and outside the academy.

President of TAAS,
Foreign Secretary of Royal Society,
Fellows of TAAS,
Invited Guests,
Ladies and Gentlemen,
I thank you very much for your attention.

Tanzania Academy of Sciences... was established to promote cooperation and collaboration with the government, other scientific organizations, the private sector and the general public in ensuring that excellence in science is attained in schools, universities and research institutions and that the best science is harnessed for the development of Tanzania.

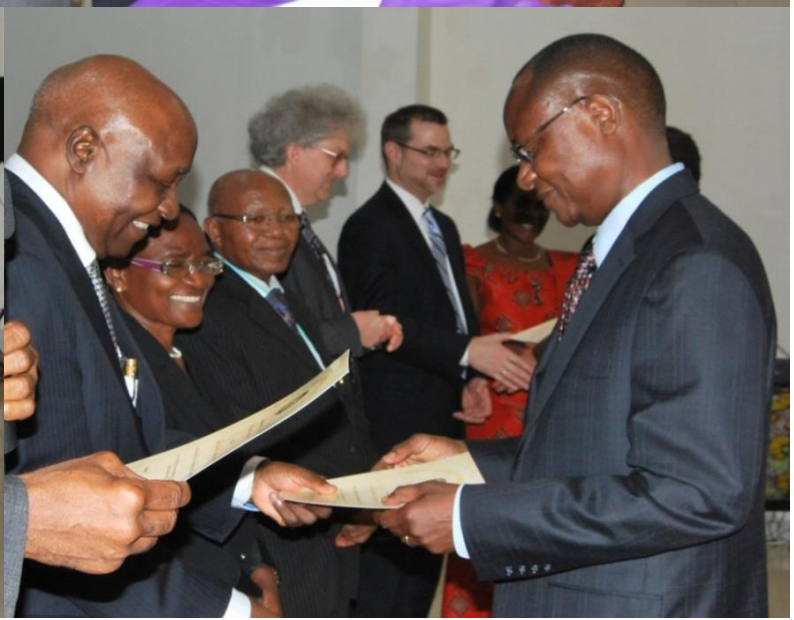
Fellows of the Academy are therefore, expected to uphold the TAAS objectives and obligations. Specifically, they are expected to support TAAS to reach its vision.

Pictorial Coverage








SONY

VISIT OF THE EXECUTIVE DIRECTOR OF THE WORLD ACADEMY OF SCIENCES (TWAS) TO THE TANZANIA ACADEMY OF SCIENCES (TAAS)

Science Technology & Innovation

Capacity Building

Professor Romain Murenzi
Executive Director of the World Academy of Sciences (TWAS)

Introduction

The Executive Director of The World Academy of Sciences (TWAS), Prof. Romain Murenzi, visited TAAS on 26 June 2013 and gave a lecture on 'Building Science, Technology and Innovation (STI) Capacity for Those Left Behind – Role of TWAS' at the Commission for Science and Technology (COSTECH) conference hall. The audience consisted of TAAS fellows and young scientists.

TWAS is an autonomous international organization founded in 1983 in Trieste, Italy by a distinguished group of scientists from the developing world (The South) under the leadership of Nobel Laureate Prof. Abdus Salam of Pakistan. It was launched officially by the Secretary General of the United Nations in 1985. A Council, elected every three years by TWAS members, is responsible for the Academy's broad policy and programmatic directions. The Secretariat headed by an executive director and located on the premises of the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy, assists the Council in the administration and coordination of the programmes.

In addition to its strong links with UNESCO and ICTP, TWAS provides administrative support for the Organization of Women in Science for the Developing World (OWSDW, formerly TWOWS), the Inter-Academy Panel (IAP) and the Inter-Academy Medical Panel (IAMP). The Academy also maintains close ties with academies, research councils and ministries of science and technology in developing countries.

TWAS main mission is to promote scientific excellence and capacity in the South for science-based sustainable development. TWAS Fellows, who live and work in developing countries, represent 85 percent of the membership. TWAS Associate Fellows live and work in developed countries. The current membership stands at 1073 *(15 January 2013)*. In 1991 UNESCO assumed responsibility to administer TWAS funds and staff.

TWAS objectives are to:

- Recognize, support and promote excellence in scientific research in the developing world;
- Respond to the needs of young scientists in S&T-lagging developing countries;
- Promote South-South and South-North cooperation in science, technology and innovation;
- Encourage scientific research and sharing of experiences in solving major problems facing developing countries.

Professor Romain Murenzi

Prof. Murenzi was introduced by Prof. Esther Mwaikambo, the President of TAAS. Prof. Murenzi gave a story of his past. Prof. Murenzi, a fellow of TWAS from 2005 and fellow of African Academy of Sciences (AAS) from 2012, became the TWAS Executive Director in 2011. He previously served as Minister of Science, Technology and Scientific Research in Rwanda. He also served as Director of the Centre for Science, Technology and Sustainability at the American Association for the Advancement of Science, and as a visiting professor at the University of Maryland. He holds a PhD in physics from the Catholic University, Louvain, Belgium and was chair and professor in the department of physics at Clark Atlanta University, USA.

Building Science, Technology and Innovation (STI) Capacity for Those Left Behind – Role of TWAS

Prof. Murenzi's talk centred on 'Building Science, Technology and Innovation (STI) Capacity for Those Left Behind – Role of TWAS'. He focused on the following issues:-

- **Knowledge** – The question posed was - what has been the continental and global impact of Tanzania and STI done in the country? Admittedly, not much. For knowledge acquisition and creation costs money and time. Team work with other scientists and other countries is necessary for copping up with the race. And here, support from national leadership is critical to ensure success in the use of STI. It is well know that of 81 countries that lag behind in STI in the world, most are in Africa and this is excluding Egypt and South Africa. As an example, Tanzania had only three members in TWAS, having been elected between 1987 and 2004.
- **Challenges** - The challenges in the next decade will be in the areas of food security, energy, disease, climate change, loss of biodiversity, water and population growth. This goes with the high expectation from the citizens for better quality housing, food, water and sanitation, health, environment, transport, education, communication, democracy, freedom of speech and entertainment. Sustainability of the human race being an issue given the population growth and the limited resources.
- **STI Policy** – The STI concerns knowledge acquisition, creation, technology transfer and innovation culture. In 1860's the USA and Argentine economies were at the same level of development and later USA economy changed due to using more STI. In 1909 to 1949, the USA economic growth had 87.5%

contribution from STI while 12.5% came from labour and capital (Robert Solow, 1957). Bill Gates expressed the opinion that innovation was more critical than just capital and labour (Washington Post, 25 February 2007). So, STI policy is not a luxury but just as critical as a security policy. The STI policy can advance critical sectors such as energy, agriculture, industry, mining and tourism while private sector is enhanced.

- **Science Literacy and Expression –** Science literacy and expression within the society and population especially in youth will reinforce the use of STI. Innovation came with expression. The academies can help the government institutions in setting long-term policies, such as national visions.
- **Intellectual Property Issues and Publications –** World share of publications in Africa is low and stagnant with most of it coming from South Africa (From 2002 to 2007 Gross Expenditure on Research and Development (GERD) at 0.9% of world). Intellectual property creation, use and security are critical in creating wealth.
- **African Resources –** Africa has a lot of resources, including: minerals, agricultural produce and biodiversity. Most of these are exported in raw form. World interest in these resources has existed for some time and recent visits by leaders from USA and China is a demonstration of this fact.
- **Role of TWAS** – TWAS and academies in Africa should be the voice for science. TWAS helps build STI capacity for the 'Left Behind'. TWAS central effort is in supporting scientific training especially for PhDs through exchange programmes, mobility of scientists from developing countries to get exposure, support to research through grants and honouring excellence. Main contributors to TWAS's current activities are :
    - The Government of Italy
    - Swedish International Development Cooperation Agency (Sida)
    - United Nations Educational, Scientific and Cultural Organization (UNESCO)
    - Illycaffe
    - the OPEC Fund for International Development
    - the Kuwait Foundation for the Advancement of Sciences (KFAS)
    - Microsoft Research Ltd, UK
    - the European Union, 7th Framework Programme (FP7)
- **TWAS Partners** - Partners in TWAS's exchange programmes are:
    - Brazil: National Council for Scientific and Technological Development (CNPq), Brasilia
    - China: Chinese Academy of Sciences (CAS), Beijing
    - Kenya: International Centre for Insect Physiology and Ecology (ICIPE), Nairobi
    - India: Council of Scientific & Industrial Research (CSIR), New Delhi; Department of Biotechnology of the Ministry of Science and Technology (DBT), New Delhi; S.N. Bose National Centre for Basic Sciences, Kolkata; Indian Association for the Cultivation of Science (IACS), Kolkata
    - Malaysia: Universiti Sains Malaysia (USM), Penang
    - Mexico: National Science and Technology Council (CONACYT), Mexico City
    - Pakistan: National Centre of Excellence in Molecular Biology (CEMB), Lahore; International Centre for Chemical and Biological Sciences (ICCBS), Karachi and
    - Thailand: National Center for Genetic Engineering and Biotechnology (BIOTEC). More information is on the website www.twas.org.)

Prof. Mwaikambo provided the vote of thanks.

TWAS and academies in Africa should be the voice for science

Awards & Honours

Prof. Esther Mwaikambo wins two accolades in a row

- **The 2013 Martin Luther King Jr. Drum major for Justice Award, and**
- **The 2013 African Best Health Research Scientist Award**

United States Ambassador His Excellency Alfonso E. Lenhardt, (left), awards the 2013 Dr. Martin Luther King, Jr. Drum Major for Justice award to Dr. Esther Daniel Mwaikambo, (centre).

March 6, 2013 was a great day for Prof. Esther Mwaikambo - the current President of TAAS. It was a day of great honour for her. It was the day when His Excellency, the Ambassador of the United States in Tanzania, Alfonso E. Lenhardt bestowed the 2013 Dr. Martin Luther King, Jr. (MLK) Drum Major for Justice Award upon Prof. Esther Daniel Mwaikambo in recognition of her tireless efforts to promote human rights and access to education and health care for Tanzanian women and girls.

The Dr. Martin Luther King, Jr. Drum Major for Justice Award is presented annually by the American Ambassador at the Embassy of the United States of America in Tanzania in commemoration of the life and achievements of Dr. King, and of a Tanzanian whose life embodies the work and commitment of Dr. King's life. In a sermon on February 4, 1968, Dr. King said, "Yes, if you want to say that I was a drum major, say that I was a drum major for justice, and say that I was a drum major for peace. I was a drum major for righteousness. And all of the other shallow things will not matter."

In his remarks, the Ambassador lauded Dr. Mwaikambo's leadership as a pioneer in Tanzania's medical sector by noting her life experiences from an early age taught her the value of perseverance in the face of tough adversity as well as compassion for those forgotten and most in need. "Those experiences embedded in her soul a deep commitment to ensuring Tanzanian women and girls enjoy their full rights, including receiving access to education and health care to reduce preventable deaths, thereby ensuring they can meet their highest potential as far as their own talents can take them. She also understands that talent and potential must be nurtured by mentors . . ." The Ambassador continued, "Often a hero is a person who tackles unpopular causes and encounters obstacles and challenges along their journey in the name of protecting others. Little by little, the moral force of their convictions gains support by transforming minds, winning support for their cause, and earning the admiration of those who share their passion for justice."

In the company of friends, dignitaries, guests, admirers, and some members of TAAS at the American Embassy in Dar es Salaam, she humbly accepted the honour. Her acceptance speech is reproduced here verbatim.

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Acceptance Speech by Prof. Esther Mwaikambo on the Occasion of "The 2013 Martin Luther King, Jr. Drum Major for Justice Award"

March 6, 2013

Professor Esther Daniel Mwaikambo

Your Excellency Ambassador Alfonso E. Lenhardt,
Excellencies,
Honourable and Distinguished Guests,
Ladies and Gentlemen:

I am greatly honoured to be selected the recipient of "The 2013 Martin Luther King Jr. Drum Major for Justice Award". I am reliably informed that the award is given to Tanzanians with impeccable credentials, character, integrity, accomplished merits, demonstrated leadership, and whose work resemble Dr. King's legacy in nonviolent struggle for justice. I am humbled and happy to be included in this list. It is with great humility that I accept this award.

My contribution is said to be that of improving the lives of Tanzanians and others, throughout my career as a Medical Practitioner, Paediatrician, Child Health Expert, professor and leader, in the medical field. Improving the health of Tanzanians would narrow the big differences between developed and developing countries. I am accepting this award while recognizing, as spelt out in the Human Development Report 2011 that:

The life expectancy at birth in Tanzania is 58.2 years (2011), when compared to 83.4 years in Japan;

The expected years of schooling are 9.1 years (2011) in Tanzania, compared to 18 years in Australia;

The under-five mortality rate in Tanzania in 2010 was 81/1000 live births, compared to 3 in Norway;

The maternal mortality or the number of maternal deaths per 100,000 deliveries in 2010 in Tanzania was 454, when compared to 3 in Ireland;

The births attended by skilled health personnel in Tanzania in 2010 were 50%, compared to 100% in Cuba and Barbados.

While things were much worse when, as the first female Tanzanian medical doctor starting internship, I took my post at the Muhimbili National Hospital in 1969, there is still yet a long way to go. During that time and several years that followed, an intern would attend up to 100 patients per day including the night shifts. Some intern doctors worked nonstop for 36 hours because there were very few doctors.

When caring for pregnant women, the number of deliveries per day sometimes reached 70, at the then Ocean Road maternity wing. All these being attended by one doctor and one nurse. The under-five mortality rate in 1974 was 176/1,000 live births. In Tanzania, in the late 1960s and 1970s, a lot of diseases afflicting pregnant women, outside the infections like malaria and malnutrition, were linked with too frequent (short spaced) pregnancies. Childhood mortality was high, mainly due to infections like malaria, respiratory infections, measles, diarrhoeal diseases, polio, and tetanus with underlying malnutrition.

This sad situation led to my calling, into the field of Paediatrics complimented with research to advance science and provide quality care as well as teaching at the university in order to build capacity. These strategies that are also undertaken by other Tanzanian colleagues have had some impact as we now have some improved health indices. As I accept this award, I wish to commend all those involved in bringing about this change. I am accepting this Award on behalf of the hard working fellow doctors in Tanzania, who deliver services under difficult if not harsh conditions. I wish to applaud the academia institutions and professional groupings such as the Hubert Kairuki Memorial University, Muhimbili university of Health and Allied Sciences, Forum for African women educationalists, Research on Poverty Alleviation, Tanzania Academy of Sciences etc. which I have been blessed to work with and where I sometimes served as a leader.

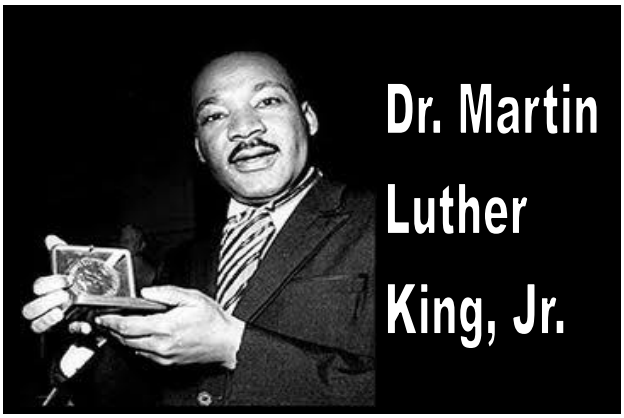
Unforgotten and most importantly, I am accepting this award for the Tanzanian girl who has a dream to make contributions towards solving problems like those mentioned, and save others in the future, in the spirit of Dr Martin Luther King Jr., who wanted to be remembered for his service to others, and as he said: as a "Drum Major for Justice".

Why then also, dedicate the award to this young Tanzanian girl with a dream to serve others? May be it reminds me of the struggles which I sustained as a young girl. I worked very hard to reach where I am, in a treacherous journey, and against many odds that demanded a lot of hard work and sacrifices. The love for reading, learning, work, discovering, analysing, innovating and inquisitiveness, helped me a great deal. And I see this girl in my life, all along.

On the other hand I see the situation that this young girl, is growing in the Tanzania of today. Tanzania is part of the world, which has become a small village. There is more turmoil in the world, and in Tanzania, for people seeking justice. There is more happening, in terms of some killing and destroying others, and their property in the name of religion, regionalism and other divisive factors. That instinct of driving for gains, and for selfish interests, is gaining ground faster than we can handle. And this is dismantling all the efforts made by Mwalimu Julius K Nyerere, the first President of The United Republic of Tanzania: efforts to unite the country, and to motivate his countrymen and women to fight poverty, disease and ignorance. His effort to create the 'Heaven of Peace', the literal meaning of Dar es Salaam, in Tanzania, is being threatened. The very issues he spoke against such as greed, tribalism, racism, division along the lines of religion and other vices, are mushrooming and growing fast in our country. I call upon all responsible systems to work hard to arrest this gloomy situation to allow this girl child to thrive in peace.

I think Dr. Martin Luther King Jr. would have wanted his sermon on February 4 1968 at Ebenezer Baptist Church, on "The Drum Major Instinct" to be broadcast again, against these selfish interests, and to give a push towards using our strong human instinct to serve others. And we should be aware that, as he said: 'There is deep down within all of us, an instinct. It's a kind of drum major instinct—a desire to be out front, a desire to lead the parade, a desire to be first. And it is something that runs the whole gamut of life'.

I have faith in this young girl, with a dream in Tanzania. I believe, that despite all the odds, she will wake up to the clarion. This is the faith in justice, freedom and liberty. At this moment I am reminded of Dr. Martin Luther King's Acceptance Speech, on the occasion of the award of the Nobel Peace Prize in Oslo, December 10, 1964, where he said: 'This faith can give us courage to face the



uncertainties of the future. It will give our tired feet new strength, as we continue our forward stride, toward the city of freedom. When our days become dreary with low-hovering clouds, and our nights become darker than a thousand midnights, we will know, that we are living in the creative turmoil of a genuine civilization, struggling to be born'.

Ladies and Gentlemen, as others, and you, have shown faith in me, I am asking you all, all Tanzanians, and the world, to put faith in this young girl with a dream, a dream to save others, and work together with others, to create a just society.

Your Excellency, Ladies and Gentlemen,

Thank you.

NIMR awards

On 16 April 2013 Prof. Esther Mwaikambo was awarded "The 2013 African Best Health Research Scientist Award" by the National Institute for Medical Research (NIMR) - Tanzania. Every year, NIMR gives two awards, one to the best African and another to the best Tanzanian health research scientist. Thus, for year 2013, Prof. Mwaikambo won the accolade for the best African health research scientist, while Dr. Martha Lemnge (PhD) received the "Best Tanzanian Health Research Scientist Award" Dr. Martha Lemnge is Chief Research Scientist and Director of Tanga Centre, NIMR.

TAAS is quite proud of their decorations. Surely, their glittering careers qualify them as shining role models that will inspire many young scientists.

Prof. Esther Mwaikambo

Dr. Martha Lemnge

Prof. Keto E Mshigeni wins Presidential Appointment

Members of TAAS wish to congratulate most sincerely Prof. Keto Mshigeni on his well deserved double honours in 2012. It is delighting to note that:

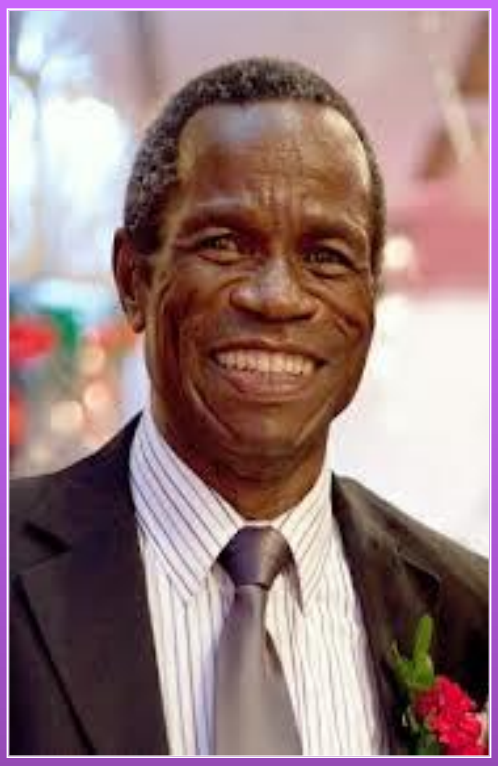
In July 2012, he was appointed by His Excellency Dr. Jakaya Mrisho Kikwete, the President of the United Republic of Tanzania to serve as Chairman of the Board of the Tanzania Atomic Energy Commission (TAEC).

In September 2012, at a General Meeting of the World Academy of Sciences (TWAS), he was elected TWAS Vice President, representing the Africa region.

His tremendous experience as a world class scholar, scientist, researcher, educationist, leader and spiritual counsellor are great assets for the two institutions. Members of TAAS wish him great success!

PROFESSOR BRUNO JOHN NDUNGURU

Obituary



Professor Bruno John Ndunguru (65) - one of the Founding Members and Fellows of Tanzania Academy of Sciences (TAAS) was born on 29th May 1947 in Litembo, Mbinga District, Ruvuma Region. He was a member of the Executive Committee of TAAS and Honorary Treasurer from July 2012. His untimely and sad demise occurred on 26th December 2012 in Dar es Salaam where he was laid to rest.

Precious in the sight of the LORD is the death of His saints
(Psalm 116:15)

Prof. Ndunguru was an agronomist who, in 1972, got his Bachelor of Science degree in agriculture from the then University of East Africa, at the University College of Dar es Salaam under the Faculty of Agriculture in Morogoro. He was awarded a degree of Master of Science degree in Whole Plant and Crop Physiology in 1974 and a degree of Doctor of Philosophy (PhD) in 1977 from the University of Reading, England.

He worked at the Faculty of Agriculture, Forestry and Veterinary Science of the University of Dar es Salaam (now Sokoine University of Agriculture) reaching the rank of Associate Professor in 1985. From 1985 to 1986 he was an agronomist and Team Leader for the Organization for African Unity Scientific, Technical and Research Commission, Semi-arid Food Grain Research and Development in Benin. Thereafter, he worked in Niger as a Principal Groundnut agronomist for ICRISAT Sahelian Centre. From 1992 to 1994 he worked as a Principal agronomy scientist and Team Leader for the South African Development Community and ICRISAT. From 1994 to 1998 he served as Director of the Southern African Centre for Cooperation in Agricultural Research and Natural Resources Research and Training (SACCAR) in Botswana. From 1998 to his retirement in 2012 he worked at the Tea Research Institute of Tanzania where he served as Executive Director from 2002. He served in several boards of institutions dealing with agriculture and education.

Prof. Ndunguru was a very committed family man. He is survived by his wife, five children and three grand children.

May His Almighty God Rest His Soul in Eternal Peace!

TAAS Publications