



Inspiring Innovation and Leadership

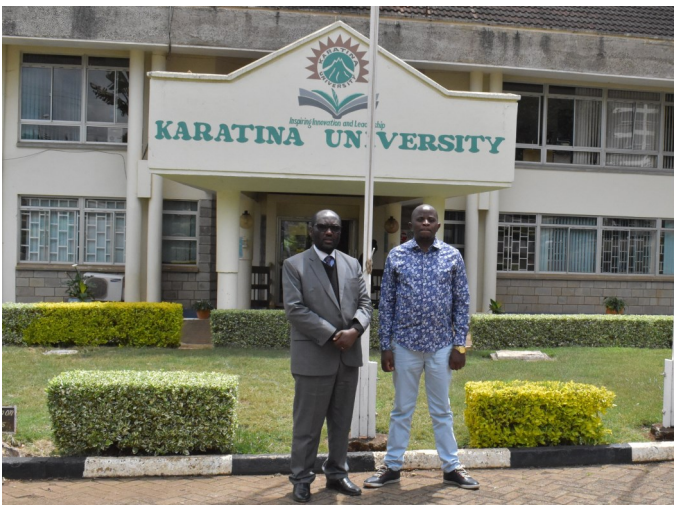
## KARATINA UNIVERSITY

Weekly Dispatch

Monday 7<sup>th</sup> – Friday 11<sup>th</sup> November, 2022

### MATHIRA CONSTITUENCY MEMBER OF PARLIAMENT, HON. ERIC WAMUMBI, VISITS KARATINA UNIVERSITY

The Vice Chancellor, Prof. Mucai Muchiri, today, Friday, 11<sup>th</sup> November 2022 hosted the Mathira Constituency Member of Parliament, Hon. Eric Mwangi Wamumbi. A number of issues affecting the institution were discussed key among them; the access road to the University, acquisition of extra land for expansion as well as mounting of programmes which the local residents can benefit from.



The Vice Chancellor, Prof. Mucai Muchiri, with Mathira Constituency MP, Hon. Eric Wamumbi

While giving a brief history of the University, the Vice Chancellor said that the institution had recorded significant growth in terms of programmes offered, student population and staff capacity development noting that over 60% of teaching staff have acquired doctorate degrees. The Vice Chancellor, however, noted that lack of land has hampered infrastructural development of the University. He, nevertheless, said that he was still optimistic that the University would soon acquire extra land.



On a tour of the University

The MP, on his part, stated that the access road to the University, which is currently under construction, has been catered for in the supplementary budget. He further noted that the Government had committed itself to ensuring that all stalled projects are completed. On the issue of land, the MP committed to engage in public participation with relevant stakeholders as viable options are pursued.



Tour of the Library

The Vice Chancellor took the MP on a tour of the University where he also visited the Library under construction.



## SO, DO YOU KNOW HOW NUCLEAR SCIENCE AND TECHNOLOGY AFFECTS YOU?

*What comes to mind when you come across the words 'nuclear science'? To many of us, nuclear science is considered a complex subject for our simple minds to understand.* For others, nuclear science is associated with the Chernobyl Disaster in the former Soviet Union or the Fukushima Nuclear Disaster in Japan. During the University-Wide Seminar Series organised by the Directorate of Research, Innovation and Extension on Wednesday, 9<sup>th</sup> November 2022, Dr. Felix Omonya Wanjala, the Programme Management Officer from the Division of Africa, International Atomic Energy Agency (IAEA), deconstructed the concept of nuclear science and technology and how it intersects with our day-to-day living.



In a presentation titled 'Nuclear Science and Technology Applications and Research Activities', Dr. Wanjala said that one of the major challenges they face is a lack of awareness on matters of nuclear science and technology.

*'Many people associate nuclear technology with bombs. However, there are other peaceful uses of nuclear science that are beneficial to the world,'* he said.

### Application of Nuclear Science and Technology

While highlighting the role nuclear science and technology have played in sub-Saharan Africa, Dr Wanjala gave grim statistics mentioning that one person in four in sub-Saharan Africa is undernourished while 23% of children in Africa attend classes hungry. In human health, 70% of people in Africa do not have access to radiotherapy even as new cancer cases in Africa increase to 1.4 million cases each year. Additionally, 30% of the population in sub-Saharan Africa does not

have access to clean and safe water even though there are 64 transboundary river basins in Africa. Also, more than 60% of the population lives without access to electricity.

Under the Technical Cooperation Programme (TCP), IAEA is working with 46 Member States, among them 26 least-developed countries, to address key development priorities while focusing on capacity building and strengthening using Member States' skills and infrastructure for socioeconomic development. IAEA is also contributing directly to 9 out of the 17 Sustainable Development Goals.

*'Nuclear techniques are being used to address many of these development challenges, including those concerning poverty and hunger, human health, energy, and climate change,'* said Dr Wanjala.

So, how does nuclear science and technology promote socioeconomic development?

Nuclear Science, Technology and Innovation development can be applied in food and agriculture, human health, water resources management, sustainable energy development, radiation safety and security, industrial applications, nuclear knowledge management among others.

**Health & Nutrition**

**Cancer Diagnosis and treatment**

Nuclear technology is used in medicine for **diagnosing and treatment of certain illnesses** including cancer

- ❖ Radiotherapy uses high doses of radiation to kill cancer cells and shrink tumours.
- ❖ The IAEA is assisting IMS to Establish and/or expand radiotherapy services through capacity building and procurement of equipment
- Expanding radiotherapy services at Kenyatta National Hospital
- Establishment of the cancer facility in other regions in Kenya (Mombasa, Nakuru, Nyeri, Kisumu, and Garissa)
- Some of the achievements includes:
  - Establishment of radiotherapy facility at MTRH

**Nutrition**

Nuclear technology (isotopic techniques) can help monitor and address malnutrition from undernutrition to obesity

- Isotopic techniques can be used for assess stunting in children using
- Some countries that have done good studies and interventions in nutrition of children include Kenya, Benin, South Africa, Botswana & Uganda



In **food and agriculture**, nuclear technology is applied in crop production by using gamma radiation on local seed varieties to induce desired changes in the plant's DNA. Not to be confused with Genetically Modified Organisms (GMO), but spontaneous mutations can generate seed varieties with new and useful traits. Mutation breeding techniques are used to improve crop varieties, yields and reduce losses. Good examples are in rice, cassava, maize, wheat and groundnuts

**Livestock production** contributes to human well-being in social and economic terms because it contributes to food supply (meat, blood and Milk) for rural and urban areas. Nuclear-related techniques like serological and molecular techniques can be used for screening and rapid detection of animal disease causative agents. In addition, nuclear technology can be used for pest control especially for insects like Tsetse flies and mosquitoes which transmit a number of diseases (malaria, sleeping sickness). The Sterile Insect Technique (SIT) is a method of biological insect control involving mass-rearing and sterilization using radiation before the insects are released into the wild. SIT has been successful in controlling a number of high-profile insect pests, including fruit flies, tsetse flies, screwworms, moths and mosquitoes.

**Water Resources and environmental Management**

- IAEA is strengthening capacity through training and procurement of equipment for water analysis and managing using isotope techniques in Kenya. (Ministry of water)
- Sahel Region Project: Using Isotopic Techniques to Map and Analyse Groundwater Resources;
- Isotopic maps for water resource management are produced
- Working with the Ministry of Water (CEO, Regional Center On **Groundwater** Resources to map water resources in Kenya)

Où nous avons fait don d'équipement et ils font de la cartographie des eaux souterraines dans la région, principalement à Mombasa et dans d'autres



In **water resources and environmental management**, isotopic and radiation methods are used to measure and monitor the interaction between soil, water and nutrients in cropping systems as a basis for developing strategies that ensure the efficient use of water and nutrients. It also controls soil erosion/sedimentation, crop nutrition, improves water quality and soil fertility.

One of Kenya's key agendas is the attainment of food security. With the current drought hitting many parts of the country, nuclear science can be used to promote **food safety**. Nuclear techniques can improve safety and quality control by detecting or eliminating harmful residues and contaminants in food products, kill potentially harmful microbes, prevent foodborne illnesses and increase the shelf life of food. In **health**, nuclear technology is used in medicine for diagnosing and treatment of certain illnesses including cancer. Radiotherapy uses high doses of radiation to kill cancer cells and shrink tumours. While in **nutrition**, nuclear technology can help monitor and address malnutrition from undernutrition to obesity. Isotopic techniques can also be used to assess stunting growth in children.

Nuclear technology also promotes **energy modeling/planning** tools which, in turn, lead to access to clean, affordable, safe and reliable energy as an important ingredient of sustainable economic growth. Other areas are in **industrial applications** and **nuclear knowledge management**.

### Opportunities available for training and research

IAEA has long-term training programmes ranging from Masters in Nuclear Science and Technology hosted in Egypt and Ghana; Masters in Medical Physics at the International Centre for Theoretical Physics (ICTP), Postgraduate Education Courses in Radiation Protection hosted in Algeria, Ghana and Morocco, Postgraduate Education Training Programmes in Radiation Oncology, Nuclear Medicine and Radio-pharmacy as well as PhD Sandwich Fellowship programmes in regionally designated centres.

IAEA has several national and regional programmes in Kenya working together with Kenyatta National Hospital, Kenya Bureau of Standards, Kenyatta University, Ministry of Water, and



Kenya Agricultural and Livestock Research Organisation among others. Locally, it has partnered with Karatina University, through the Dean, School of Pure and Applied Sciences, Dr. Jeremiah Kebwaro, for a research project titled *'Enhancing Regional Capabilities for Sustainable Uranium Exploration and Mining (AFRA).'* The objective of the Project is to increase the development of national infrastructure for the uranium production cycle that will encompass everything from exploration to decommissioning.

### Career Paths for the Young Generation in Nuclear

Dr. Wanjala listed the below career paths for young people interested in nuclear science and technology:

- Energy Planning Experts
- Medical Imaging
- Medical Physics
- Nutritionists
- Food and agriculture specialists
- Water and environmental management specialists
- Research and development
- Nuclear regulator
- Nuclear science teacher/lecturer
- Nuclear lawyer
- Nuclear or safeguards inspector
- Nuclear installation technician



### KARATINA UNIVERSITY THRASHES TIBS IN FRIENDLY GAMES



Karatina University hosted Thika Institute of Business Studies (TIBS) on 4<sup>th</sup> November, 2022 for friendly matches in Soccer (Men), Volleyball (Men) and Handball (Men).

The soccer match ended in a draw of 1-1 while in Volleyball (Men), TIBS were thrashed 3-0. The KarU Handball (Men) won all their matches of the day.



Volleyball



Handball



Part of the team

