Kenyatta University
Transforming Higher Education...Enhancing Lives

The Inaugural Biannual Publication from the Division of Research, Innovation and Outreach

Research and Innovation News

Issue No. 1 | December 2016
University Fundamental Statements

Vision Statement
The Vision of Kenyatta University is to be a dynamic, inclusive and competitive centre of excellence in teaching, learning, research and service to humanity.

Mission Statement
The Mission of Kenyatta University is to provide quality education and training, promote scholarship, service, innovation and creativity and inculcate moral values for sustainable individual and societal development.

Identity Statement
Kenyatta University is a community of scholars committed to the generation and dissemination of knowledge and cultivation of wisdom for the welfare of society.

Core Values
Truth, Creativity, Excellence, Self Reliance, Innovation, Equal Opportunity, Corporate Governance, Institutional Culture, Competitiveness, Academic Freedom and Respect for Diversity

Philosophy Statement
Sensitivity and responsiveness to societal needs and the right of every person to knowledge.
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We would like to heartily welcome you to the inaugural issue of the Kenyatta University Research Publication.

This biannual publication spearheaded by the Division of Research, Innovation and Outreach aims at publicizing ongoing research, innovation and extension as well as providing a place for Kenyatta University scholars to share their research activities including innovations and extension while defining our research agenda and vision. In particular, the publication will focus and highlight topical news and stories related to the following areas among others:

i. Ongoing research and Innovation news
ii. Research partnerships and collaborations including with industry
iii. Research publications and exhibitions
iv. Research grants won by members of staff
v. Visiting scholars (both to and from Kenyatta University)
vi. Research awards and honors
vii. Research based community service and extension
viii. Kenyatta University outstanding researchers at different levels of their career
ix. Upcoming events
x. Our research agenda as guided by Kenya Vision 2030 and the UN Sustainable Development Goals.

The current issue highlights some selected topical areas in-line with the vision, mission and identity of Kenyatta University.

We therefore look forward to your contributions as we make the publication an interesting and exciting experience.
Management Board

DVCs

Prof. Paul K. Wainaina
Ag. Vice-Chancellor

Prof. Frederick Q. Gravenir
Deputy Vice-Chancellor (Research, Innovation & Outreach)

Prof. Vincent Onywera
Registrar (Research, Innovation & Outreach)

Prof. John Okumu
Deputy Vice-Chancellor (Academic)

Dr. Andanje Mwisukha
Ag. Registrar (Academic)

Prof. Godfrey Mse
Deputy Vice-Chancellor (Finance & Development)

Dr. Nelson Karagu
Registrar (Finance & Development)

Prof. Wangari Mwai
Ag. Deputy Vice-Chancellor (Administration)

Dr. Daniel Muindi
Registrar (Administration)

REGISTRARs

Prof. Caroline L. Thoruwa
Director, Offshore & Satellite Campuses

Mr. Joseph I. Gitahi
Chief Finance Officer

Prof. Grace Bunyi
Ag. Registrar, Corporate Affairs
Message from the Vice-Chancellor

World over research, innovation and extension is acknowledged as a multifunctional tool that facilitates socio-economic change and growth. This reality has necessitated increased commitment and investment in research related activities by most economies globally.

The recently adopted Sustainable Development Goals (SDGs), the Continent’s blueprint for Science, Technology and Innovation STISA-2024 and Kenya’s Vision 2030 echoes the imperativeness of elevating research to a position of high strategic importance within any development plan. Universities as institutions of research and higher learning need to take a leadership role in transforming our nation and the region to a knowledge-based, highly skilled and innovative community that can provide adequate solutions to the current and emerging challenges, develop new knowledge, techniques, and technologies increasing our global competitiveness, foster entrepreneurship and creativity, industrial development and champion sustainable use of our natural resources. Kenyatta University is committed to ensuring that Research, Innovation and Outreach are at the heart of the Vision and Strategic Plan. I invite you all to be at the forefront of increasing research and innovation excellence and its utilization for the good of mankind.

Prof. Paul K. Wainaina
Ag. Vice-Chancellor
Message
from
the DVC-RIO

Research serves as an excellent conduit for realizing groundbreaking scientific and technological innovations, technical and professional competencies and a knowledge-based economy all of which are crucial in realizing sustainable socio-economic growth and development within any economy.

Universities as research institutions are expected to spearhead the Nation’s competitiveness in global research and innovation, transfers of technologies, utilization and ownership of research outputs by the communities, commercialization of research products and services as well as influence policy changes. Communication and publicity of research strategies, processes, outputs and benefits in a simple, understandable and straightforward thus becomes an important activity that helps raise public awareness, build trust and confidence, secure necessary political buy-in and involvement of stakeholders in matters research. The launch of this Research newsletter is timely as it will bring clarity to the purpose and contribution of research in the development agenda more so the Kenya Vision 2030 and the UN Sustainable Development goals. I invite you all to contribute towards raising the University profile and visibility more specifically in actively responding to societal needs and challenges through research.

Prof. Frederick Gravenir
Deputy Vice-Chancellor - Research, Innovation and Outreach

Prof. Vincent Onywera
Registrar
Research, Innovation and Outreach
Efficient Structure to enhance Research, Innovation and Outreach

The Division of RIO is on the run. This follows the approval by the University Management on the establishment and operationalization of two additional directorates namely the Directorate of Research Support and the Directorate of Research Dissemination and Uptake. These directorates are in addition to already existing ones that include:

1. Directorate of University Industry Partnership (UIP)
2. Directorate of Community Outreach and Extension Programmes (COEP)
3. Directorate of Intellectual Property Rights (IPR)
4. Directorate of Chandaria Business Innovation and Incubation Center (CBIIC)
5. Ethics Review Committee (ERC)
6. Biosafety Committee

Directorate of Research Support

Dr. Maina Mwangi
Director

Directorate of Research Support, mandated to augment the University’s research capacity through skill development and increase competitiveness for research funding. The Directorate shall:

- Source for and provide information on funding sources and requirements.
- Organize and conduct proposal writing workshops.
- Coordinate the development of large, multi-disciplinary university research proposals.
- Coordinate internal review of grant applications in response to funding announcements.
- Oversee reporting of research progress and funder satisfaction on project completion.
- Coordinate the establishment of university research skills and capacity inventories.
- Organize training to update staff knowledge and skills on research methods.
- Building research capacity of academic staff to enhance teaching and supervision of postgraduate students.
- Develop and strengthen research partnerships nationally and internationally.
- Work closely with directorates, departments, schools and colleges to enhance research in KU.

Chandaria Business Innovation and Incubation Centre

Dr. George Kosimbei
Director

Chandaria Business Innovation and Incubation Centre, mandated to stimulate innovation among our students and the public resulting to commercialization of viable ideas and creation of employment opportunities.

- Blend academic training and research with entrepreneurship.
- Motivate Kenyatta University’s staff, students and others towards being innovative and entrepreneurial.
- Utilize Public-Private-Partnerships (PPPs) in achieving the Mission of the Centre.
- Provide high-level professional mentorship to incubates.
- Provide adequate and excellent facilities for the incubates to develop their ideas.
- Seek funding to support incubation activities.
- Seek to position Chandaria BIIC as a regional incubation hub.
- Provide a model business and innovation incubator replicable locally and internationally.
**Directorate of Research Dissemination and Uptake**

Prof. Simon Onywere  
Director

Dissemination and uptake of research findings is a critical part of the research process. Typically, research is not fully complete until the findings have been made widely available. The production of new knowledge through the practices of research and scholarship therefore lies at the heart of Kenyatta University’s mission. The Directorate of Research Dissemination and Uptake therefore is mandated to:

- Facilitate dissemination of research findings beyond formal publication in journals or books and include policy briefs, print and electronic media as well as digital repositories.
- Engage departments and schools in choosing appropriate and quality journals to publish their research findings.
- Providing advice and support in the planning of conferences, workshops and seminars by units within Kenyatta University once requests have been considered and approved by the Vice Chancellor.
- Providing advice, support and monitor the growth and development of academic journals and other publications in the University by providing standards.
- Coordinate the dissemination of research results through conferences, workshops and seminars.
- Coordinate public and inaugural lectures.
- Develop strategies that enable the university to disseminate the full range of its community’s research and innovative products and services now and in the future.
- Promote the use of the University’s institutional repository and self-archiving.
- Work closely with the Directorate of Community Outreach and Extension to promote uptake of research findings.
- Support researchers in creating targeted messaging (e.g. policy briefs, press releases) emphasizing the role of research evidence in contributing to better programmes and improved interventions.

**Ethics Review Committee**

Dr. Titus Kahiga  
Director

Mandated to review prospective and continuing research protocols so as to safeguard the dignity, rights, safety, and well-being of all actual or potential participants in biomedical research. The Committee shall:

- Review and clear proposed research before its commencement.
- Provide independent, competent, and timely review of the ethics of proposed studies. In its procedures and decision-making.
- Review prospective and continuing research protocols so as to safeguard the dignity, rights, safety, and well-being of all actual or potential participants in biomedical research. This is in cognizance of the fact that the goals of research, should never be permitted to override the health, well-being, and care of research participants.
- Review the adequacy of the informed consent document, particularly as to its description of the risks and benefits.
- Ensure that there is regular evaluation of the ethics of ongoing studies that received a positive decision.
- Act in the interest of potential research participants and concerned communities, taking into account the interests and needs of the researchers, and having due regard for the requirements of relevant regulatory agencies and applicable laws.

**Research Management & Budget Office**

The Research Management and Budget Office provides oversight and management of research grants as per the University policy by:

- Managing funded research contracts
- Managing research budgets
- Processing payments to researchers
- Filling of soft and hardcopies of funded proposals
- Providing information to Principal Investigators with deadlines for submission of both technical and financial reports.
- Ensures compliance with sponsors and university expectations for managing sponsored program funds.
- Verify requests by researchers
- Keeping records of activities
Mandated to pursue collaborations between the University and various industries for purposes of skill development, innovation and technology transfer and possible stimulation for additional R&D investment by the private sector players expanding the relevance of research carried out within the University:

- Strengthen the link between University and the private section locally and internationally.
- Co-ordinate good will activities between the University and Industry.

Mandated to spearhead protection of different forms of Intellectual Property generated at the University, and facilitates their downstream development into new commercial ventures. The Unit shall:

- Ensure compliance of the Intellectual Property Policy within Kenyatta University’s campuses and in all collaborative Research and Development arrangements with other partners.
- Develop the Kenyatta University Intellectual Property Policy through appropriate consultations and periodically recommend amendments where necessary.
- Create awareness within the University community on IPR issues, including the importance of protection where relevant.
- Receive and evaluate innovation disclosures and, where possible seek appropriate protection either, within Kenya, the African continent and beyond.
- Liaise with relevant bodies to steer the incubation of protected innovations towards viable commercial entities and, when and where appropriate, nurture local entrepreneurs to spearhead production and marketing of the products.

Seeks to reach out to communities outside the University and impact them positively through well-coordinated outreach initiatives that are need based and research driven.

- Sensitize the university community, both staff and students, on the importance of reaching out to communities and positively impact their lives.
- Conduct needs assessment to identify community needs and the available resources for relevant interventions.
- Coordinate community service projects for students and staff.
- Assist the university community in identifying, planning, implementing, monitoring and evaluating community-based projects for further intervention.
- Mobilize resources from the campus and off-campus community and other stakeholders to address community needs.
- Establish links with relevant collaborators and stakeholders outside the university to help in accomplishing the university’s vision of service to humanity.
University Online
Research presence on the Increase.

The University’s online presence has continued to improve over time both within the continent and globally as a result of suitable research environment and commitment by members of staff in engaging in creative research, innovation and outreach. The figures below shows the trend of our online research presence globally, regionally and nationally. Note that the closer we tend towards 1 the better for the University.

Key:
- DRS - Director, Research Support
- DRD & U - Director, Research Dissemination and Uptake
- BSC - Bio-Safety Committee
- ERC - Ethics Review Committee
- DUIP - Director, University Industry Partnerships
- DIPR - Director, Intellectual Property Rights
- DCBIIC - Director, Chandaria Business Innovation and Incubation Centre
- KUPEB - Kenyatta University Press Editorial Board

Dr. Reuben Njuguna
Online Communication Manager
University responds to Call for Proposals by the National Research Fund

The government recently called for research proposals from research and training institutions, faculty members and students. The main categories of the 2016 Call were:

- Development of Research Infrastructure
- Multidisciplinary Research
- Postgraduate Research (PhD and Masters)

The University responded by submitting 149 proposals as outlined below:
1. Postgraduate students proposals 115
2. Multi-Disciplinary proposal 23
3. Infrastructure 11

KU Staff continue to share their research finding thorough various means including conferences, workshops, exhibitions, galleries and publishing in peer reviewed and refereed journals. The dissemination of findings is line with the University’s identity statement which defines us as a community of scholars committed to generation and dissemination of knowledge and cultivation of wisdom for the welfare of society.
Kenyatta University has developed a policy to acknowledge and appreciate members of staff who share their research findings through publications, exhibitions. The aim of the policy is to provide a framework and establish an additional mechanism of motivating staff to engage in creative research and share their research findings as widely as possible in line with the University open access and self-archiving strategies.

This exciting development will see members of academic staff get cash bonus per book authored or published. The payment shall be considered based on the rank, reputation of the journal and the Beall’s list of publishers. In addition, colleagues who showcase their work at a peer attended fora particularly the ones by national, regional and international professional bodies will also be considered for the incentive.

To further strengthen research, creativity and innovation, the University will continue supporting excellence through various ways including but not limited to:

i. Recognition during the annual university honours day
ii. Support to participate in conferences and other academic areas
iii. Promotion

We urge members of staff to take advantage of this new policy and engage creative research and innovations and share their research findings for the benefit of society. This policy will be implemented by the Division of Research Innovation and Outreach on behalf of the University Management.

Incentives to Motivate Staff to Attend Conferences

Kenyatta University announced the revision of the Travel Research Grant Policy. The travel research grant serves to facilitate academic staff members attend local or international peer-attended conferences, symposia and exhibitions. The travel grant is awarded to staff in form of air ticket to the conference venue, subsistence during the travel or payment of conference registration fees. The travel grant aims to encourage academic staff in University participate in international scientific/artistic conferences, disseminate their research findings, build research networks and work on their professional development. The University previously only paid for a single item i.e. either pay the conference registration fees, or give subsistence or pay for air ticket. However this policy has been revised and the University will henceforth be facilitating members of academic staff by paying for any two of the items. The revision applies to academic staff members whose abstracts have been accepted for presentation at peer attended scientific/artistic conferences.

Inaugural Lectures Series on Track

Kenyatta University, like other world class universities, has made delivery of inaugural lectures a central part of its academic calendar and university academic life. Inaugural lectures are held to showcase and celebrate the University’s new professors before an audience of members of the university community and the general public. In giving an inaugural lecture, the new professor can celebrate an important personal milestone with family, friends and colleagues, old and new. Academic colleagues can also hear about research that is going on around the University.

The lecture provides a platform for the academic to present the body of research that they have been focusing on during their career providing the key highlights of the individual’s contribution to knowledge, emphasizing the depth of research, knowledge gaps and showing the way to further research. It is expected that the research knowledge that the inaugural lecturer has acquired over the period up to becoming a professor is used to dissect a problem. The inaugural lecture platform cannot be used to disseminate the results of a particular study as done in conferences.

The University has through the Division of Research, Innovation and Outreach developed for implementation a policy to guide University Inaugural Lecture series. All full professor promoted at Kenyatta University are expected to give Inaugural Lecture and this should ideally happen within the first twelve months of the promotion.
In an effort to enhance the achievement of Kenyatta University’s research, innovation and outreach mandate, the University established the Vice-Chancellor’s Research Grant in 2009. The goal of the Vice Chancellor’s Research Grant is to ensure that scholars contribute to attainment of Kenya Vision 2030 as well as the Sustainable Development Goals (SDG). The objectives of the Vice Chancellor’s Research Grant are therefore to:

i. Promote a research culture in the University
ii. Enhance research capacity among middle career faculty members
iii. Strengthen adherence to research ethics
iv. Promote the utilization of research findings for societal development
v. Promote collaborative research between and within disciplines in the University
vi. To promote research uptake

The University recently called for applications for the 2016/2017 Vice-Chancellor’s Research Grant. The thematic areas for the 2016/2017 call were:

i. Agriculture and Food Security
ii. Health and well-being
iii. Safety, Security and peace
iv. Science, Technology and Innovation
v. Entrepreneurship and poverty eradication
vi. Quality Education
vii. Natural Resources

Grants to support Innovative Research Projects

In an effort to further invigorate and foster innovation in science and technology, the 2016 Vice Chancellor’s Research Grant introduced the call for proposal on innovative projects that will be open annually. The innovation call will consider projects that require support for the development of process/prototypes into products/machine for funding.
Dr. June Madete from the School of Engineering received European Union grant under the Erasmus Mundus Mobility Scheme for a project entitled, "Africa Biomedical Engineering Mobility: Building Needs Based Healthcare Technology Competences" (UBORA project). UBO-RA project highlights the pressing need to increase capacity in health technologies training and research to enable the continent to rise to the challenges of ensuring access to a sustainable, cost effective and self-sufficient health care system. Its goal is the creation of an open virtual infrastructure for designing safe biomedical devices. The project is a collaborative venture between Kenyatta University, Ugandan Industrial Research Institute (UIRI), Pisa University of Madrid, KTH in Stockholm, University of Tartu, Estonia and a software company in Estonia.

Dr. Winfred Mutuku from the Department of Mathematics was awarded the Engineering and Physical Sciences Research Council’s (EPSRC) Global Challenges Research Fund Institutional Sponsorship grant, for a project entitled “Water resource modelling in arid and semi-arid environments”. The research is a collaborative project between Kenyatta University and the University of Strathclyde, United Kingdom and aims to elucidate the interaction between vegetation, groundwater and soil structure which is crucial for agricultural planning and management using mathematical modelling. The proposed model will provide an insight on the effect of soil structure on vegetation and ground water.
Drs. Teresa Mwoma from the Department of Early Childhood Studies was awarded a grant by the Africa Early Childhood Network (AfECN) to support the advocacy and strategic planning activities at the Department of Early Childhood Studies.

Dr. Fredrick Tamooh from the Department of Zoological Sciences won an International Atomic Energy Agency (IAEA) grant for a project entitled, "Isotopic tracing of nitrate sources and transformation in River Sabaki, Kenya". The research seeks to improve expertise and collaboration among Member States in the use of environmental isotopes to better assess nitrogen pollution and eutrophication processes on water resources variability, availability and sustainability.

Dr. George Kariuki from the Department of Agricultural Science and Technology was awarded funding by Osho Chemical Industries for a project entitled, "Bioprospecting for Potential Biocontrol Agents in Kenya and Capacity Building in Crop Protection". This research will help to facilitate new biocontrol technologies and applications that may possibly result in commercialization of the same. In addition, the project will support up to ten post graduate students studying Plant Pathology and Entomology with a bias to biocontrol agents.

Dr. Maina Mwangi from the Department of Agricultural Science and Technology was awarded a research grant by the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) to conduct a study entitled, 'Promotion of Technologies to Enhance Passion Fruit Productivity under Recurring Drought Events in Semi-arid Eastern Kenya'. The project purposes to improve the yield and quality of sweet yellow passion fruit varieties through agronomic practices and technology packages for nutrient and water management under water stress conditions in arid and semi-arid conditions.

Dr. Mathew Ngugi Piero from the Department of Biochemistry and Biotechnology is among the successful candidates for the National Commission for Science Technology and Innovation (NACOSTI), Kenya – South Africa Joint Research Program. The KU scholar was awarded funding for a project entitled: "Proteomics and contained laboratory assessment of locally developed transgenic drought tolerant maize". The research is a collaborative project between Kenyatta University and the Agricultural Research Council (Infruitec-Nietvoorbij) South Africa, which seeks to develop crosses of transgenic maize lines that is drought resistant. The project also seeks to demystify the transgenic crops technology and create confidence on local capacity thereby improving ultimate acceptance and adoption of the resulting transgenic maize lines.

Prof. Fredrick Gravenir from the Department of Educational Management Policy Curriculum Studies was awarded a research grant by Elsevier Foundation to conduct a study entitled, 'Consumer Health Literacy Promotion in Public Libraries in Africa'. The project aim is to improve access to and use of freely available, relevant, up-to-date and evidence-based consumer health information in public libraries across seven sub-Saharan African countries. Coordinated by the NIH founded Network of African Health Librarians (NAML), each of the seven in-country health librarians will target three public libraries. They will undertake an assessment of librarians’ training needs, develop training content, deliver workshops to public librarians, develop project plans together with the public librarians, and finally provide monitoring, evaluation, and dissemination of lessons learned. One of the project’s key goals will be to establish and sustain linkages between academic health sciences libraries and public libraries to improve the overall health literacy of patrons and prevent non-communicable diseases.
The Directorate of Research Support was awarded the German Academic Exchange Service (DAAD) In-Country In-Region scholarships to train postgraduate students in Biotechnology, Environmental Planning Management, Integrated Watershed Management and Renewable Technology. The main purpose of the DAAD programme is to support the development of young staff members and particularly qualified students in fields of study that are development-related.

The School of Pure and Applied Sciences won the Africa Development Bank/ Government of Kenya (ADB/GOK) grant to support “Enhancement of Quality and Relevance in Higher Education Science and Technology”. The project aims to improve quality and relevance in engineering faculties in line with Kenya’s Vision 2030 priorities for science, technology and innovation (STI) and human resource aspirations of the East Africa Community (EAC) integration.

University grant awards

Prof. Vincent Onywera from the Department of Recreation Management and Exercise Science was awarded a research grant by the International Olympic Committee (IOC) to conduct a study entitled, ‘Active cities as catalysts for well-being in Africa: The case of Nairobi, Mombasa and Kisumu cities in Kenya’. The goal of the project is to analyze the built environment and investigate any existing strategies, policies and practices aimed to promote physical activity and active transport among residents living in the three Kenyan cities with the goal of addressing the rising cases of Non-Communicable Diseases (NCDs).

Prof. Michael Gicheru from the Department of Zoological Sciences won a grant for a project entitled, “Development of Cholecalciferol, A Non-coagulant Rodenticide” by AJI Technology Ltd (UK). The project aims to develop novel method of rodent control which differs in both active ingredient and delivery mode.

Prof. Chris Shisanya from the Department of Geography was awarded a research partnership by Lund University to conduct a study entitled, ‘Gender and Pro Poor Agricultural Growth; Non-Farm/Farm Linkages and Village Dynamics in Sub Saharan Africa’. The project aims to analyze broad based agricultural growth from a gender perspective and to situate these processes locally, against the backdrop of specific national policies and broader demographic, socio-economic and climate related changes. The objective of the study is to assess under what social and institutional conditions pro-poor agricultural growth entrenches or redresses gender based differences in access to agrarian resources and what consequences this has for linkages to the nonfarm sector.

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Dr. Steven Runo from the Department of Biochemistry and Biotechnology won the Biotechnology and Biological Sciences Research Council (BBSRC) Global Challenges Research Fund for the study entitled, ‘Engineering Resistance to Maize Lethal Necrosis’. The aim is to generate GM lines that are resistant to this disease for comparison with conventionally bred varieties.

Dr. Titus Kahiga from the Department of Pharmacy and Complementary/Alternative Medicine was awarded funding by the Institute for Development Studies for a project entitled, “African Universities’ Research Approaches (AURA) Capacity Development Programme”. The AURA Programme is a learning partnership led by the Institute of Development Studies in collaboration with ITOCA (Information Training and Outreach Centre for Africa), and Professor Mark Hepworth at the Centre for Information Management (CIM), Loughborough University, that aims to address continent-wide goals, as expressed at the UNECA annual conference (2014), aims to strengthen and support universities to transform Africa through investments in people-centered innovations that will bring about economic prosperity and democratic and responsive governance.

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Kenyatta University has set up a Human Performance Laboratory (HPL) in collaboration with the ‘Aristotle of Human Physiology’ the late Prof. Bengt Saltin, of Copenhagen Muscle Research Centre. The HPL will focus on both basic and applied research relating to human neuro-musculo-skeletal health and well-being. The Laboratory is anchored in the Department of Recreation Management and Exercise Science.

The Human Performance Lab has been involved in world-class research looking at the metabolic component and pulmonary function of elite Kenyan athletes. It is currently a key component of post graduate learning and research, helping to bridge the gap between lifestyle diseases and exercise as medicine. The lab is equipped for conducting, sub-maximal and maximal oxygen consumption testing, resting metabolic rate determination, blood lactate testing and body composition. The lab aspires to be a research hub on human and exercise physiology, providing neural, muscular, skeletal and metabolic health solutions in the prevention and management of chronic disease using exercise as medicine. The lab still needs modest resource allocation to be fully functional. The lab has benefited from equipment donations by collaborators such as the University of Ottawa, Children’s Hospital of Eastern Ontario Research Institute.

Kenyatta University ARCGIS Programme: A Lighthouse of Geospatial research knowledge in Sub-Saharan Africa

Kenyatta University has made tremendous progress towards empowering the University community with spatial knowledge for problem solving through Geographic Information System (GIS) training over the past years. In the quest to impart practical GIS skills, the institution partnered with Environmental Systems Research Institute (Esri) in 2012, in the 100 African Universities programme. The 100 African University’s programme was a 10+ million dollars initiative launched by Esri to support and enhance the study of Geographic Information System (GIS) among students in 100 African Universities.

The programme’s objective was to accelerate GIS education in sub-Saharan Africa. Since the acquisition of the site license, over 1000 students have been trained on (GIS) and remote sensing. Besides the GIS trainings, the University has participated prominently in capacity building and dissemination forums such as Esri User Conference, Esri Eastern Africa Education conferences, GIS Days, among other workshops.

Previously used as a research tool limited to a few professors and graduate students, the university now boasts a multi-campus ArcGIS implementation that is a respected center of excellence throughout Eastern Africa.

The impact of the GIS training has seen several students advance their careers in GIS and gain entrance to post graduate programs. The skills have also increased their employability potential.

The University has also extended mentorship support to other institutions such as Kabianga University College, Kisii University and the Technical University of Kenya among others. Kenyatta University is now a reference account with Esri, providing leadership in GIS and technology body of knowledge in the region. ‘The University is now a continental lighthouse who’s GIS light is beaming far and wide.'
Kenyatta University Research and Innovation News

Inaugural Publication from the Division of Research, Innovation and Outreach

December 2016

Kenyatta University is the only public university in East & Central Africa to have a Biosafety Level II Plant Transformation Laboratory facility. The facility commonly referred to as the PTL Lab was established in 2005 in the Department of Biochemistry and Biotechnology, Kenyatta University in collaboration with the Rockefeller Foundation, USAID, and the USDA to conduct both basic and applied research in plant genetic engineering. For 10 years now, this lab remains the only such facility in the region’s higher education institutions.

Research in the PTL Lab focuses on enhancing food security by genetically improving local staple food crops such as maize, sorghum, cassava, sweet potato, rice, tomato, pigeon pea, groundnut against drought, salinity, weeds, pests, diseases and aflatoxin. The facility has established incredible infrastructure and attracts studentship from various countries in Africa including Tanzania, Ethiopia, Sudan, Malawi, Ghana, South Africa, Cameroon and Kenya. The facility has trained over 20 PhD and 30 MSc students. In recognizing its contribution in advancing genetic engineering research that targets regional challenges, the facility was recognized in 2013 as a center of excellence and is now the only affiliate center in sub-Saharan Africa for the International Center for Genetic Engineering and Biotechnology (ICGB). In addition, the facility currently serves as a demonstration site and is used by National Biosafety Authority as a reference laboratory for detection and monitoring of biotech products.

PTL Lab is approved by the Kenyan Plant Health Inspectorate Services (KEPHIS) to carry out plant genetic transformation work. PTL Lab prides in state of the art equipment including a Leica stereo microscope, qRT-PCR machine, a gel documentation system, autoclave, light microscopes, laminar flows, growth chambers, thermocyclers, water baths, freezers, refrigerators, microfuges, microwave, hybridization ovens, pH meters, balances. In addition, the facility has two green houses.

Soil Science research Laboratory at Kenyatta University

Soil Science Lab is a multidisciplinary centre that brings together postgraduate students and researchers to explore and improve knowledge of soil processes and management practices that enhance production, protect the environment and build soil resources. Research in the Soil Science Lab focuses on enhancing food security by developing sustainable soil management systems in maize, soybean, and irrigated cropping systems. The facility has established implausible infrastructure and has state of the art equipment which includes: an autoanlyser with spectrophotometer (model FIAnalyst 5000 Analyzer; with additional method cassettes), Flame photometer (model 410 classic), Atomic Absorption Spectrophotometer [AAS] (Model Thermo-Elemental iCE 3300 Double Beam AA), UV-VIS scanning spectrophotometer (model ThermoFisher Genesys 10S Scanning UV-VIS; wavelength range 190 – 1100nm), and CN analyser (model Thermo Fischer Flash 2000 series CN automatic elemental analyzer). The facility has trained over 30 MSc students from Kenya, Mozambique, Rwanda, Burundi, Malawi, and Zimbabwe.
Kenya University hosted the Inaugural Africa Innovation Festival 2016 whose theme was: "Climate Change Mitigation and Adaptation". The festival took place on 10th to 14th October 2016 and was officially opened by Cabinet Secretary for Environment and Natural Resources, Prof. Judi Wakhungu. The objectives of the festival were to:

i. Provide a platform for Universities, Technical and Vocational Institutions and Secondary Schools to showcase their innovations and present them for judging

ii. Provide a platform for venture capitalists, investors and other scouts to come and interrogate the innovations

iii. Revitalize the innovation and entrepreneurship ecosystem by providing a platform to support new ventures.

The Cabinet Secretary thanked and congratulated the University for taking the bold step in implementing the Nationally Determined Contributions (NDC) that will assist in achieving the objectives of the United Nations Framework Convention on Climate Change (UNFCCC).
Innovations at Chandaria Business Innovation and Incubation Centre (CBIIC)

Recycled Cooking Oil to Make Bar Soap

Nyambura Ngugi Joseph and Mauren Wanjiku Nyambura, incubates at KU Chandaria Business Innovation and Incubation Centre (CBIIC) are making soap from old cooking oil. The innovators recycle the oil and react it with lye to produce a quality bar of soap. The bar soap is highly efficient in areas with hard water. It is currently available in the market in Naivasha, Olekasasi, Muranga and Rongai. Chandaria Incubation Centre is working to improve the product to face the stiff competition, giving business advisory services, and company registration and office space provision.

Bitsoko Makes Mobile Money Transfer Cheaper

Bitsoko is an Android mobile wallet that implements Blockchain technology in a bid to both remove the cost of transferring money between two individuals and to increase access to payment services. Their approach integrates Blockchain technology into the current mobile money platform in Africa and service providers, allowing access of funds to be sent from the developed world through Bitcoin to be received as mobile money. By integrating specific services such as energy providers, paying bills, payroll solutions for merchants in Kenya, Bitsoko hypothesize that these easy-to-use services will create a system that can support small scale payments in all aspects of financial lives. These solutions to lower the costs of sending and spending funds can provide the stability and empowerment for further solutions and innovations to be created on our open development platform. Bitsoko can replicate our services to integrate Blockchain with mobile money in East Africa throughout the continent and the rest of the world.

Greener Planet

KU Chandaria Business Innovation and Incubation Centre (CBIIC) incubates, Chemolex ltd is a green start-up company based in Nairobi, Kenya with an aim of providing low income off-grid rural households with clean and affordable home lighting system. Chemolex produces rechargeable solar batteries. Chemolex is currently piloting in Gem Yala, Western part of Kenya, upon receipt of grant fund by Smart villages. With the 3,000 US Dollars grant they set up a 1 KW solar charging station and acquired home lighting systems covering 60 households. The systems consisted of rechargeable batteries, energy saving lamps and mobile phone charging devices.

Recycling Polythene Papers to Produce Cooking Gas

Mega Gas Enterprises, a start-up company at the KU Chandaria Business Innovation and Incubation Centre (CBIIC), focuses on gas production using polythene papers, where they recycle plastic waste to produce cooking gas for domestic and other purposes. This company is working towards cleaning the environment from accumulation of LDPE which cannot be otherwise recycled. The project working principle is distillation of the waste plastic and harvesting of flammable gases which are then packed in gas cylinders. It has been patented with the gas currently undergoing testing at the Kenya Bureau of Standards to ascertain its safety.

Driving at Night Made Safer with Sirius Systems

Bryan Dawson Mwangi an incubate at the KU Chandaria Business Innovation and Incubation Centre (CBIIC) has developed a Universal Headlights Dimming System (UHDS) aimed at making driving at night safer. The device makes headlights light responsive so that it automatically dims headlights on detecting an oncoming vehicle, and hence reduce glare related accidents on our roads. The device is intended to automate the control of headlights making night driving safer and more comfortable. The device is universal and can therefore be installed on any vehicle and on any other machinery that uses headlights.

Sirius Systems recently presented the innovation to the KCB Lion’s Den TV show, but was unsuccessful as the innovation is still at the idea stage although is seeking finances to develop a prototype.
Dr. George M. Kariuki, a senior lecturer in the Department of Agriculture Science and Technology, partnered with Koppert Biological Systems Kenya and Koppert BV Netherlands in a project entitled: Development, Validation and Dissemination of Integrated Pest Management Packages for Tomato Leafminer (Tuta absoluta) and Fusarium Wilt-root Knot Nematode Complex affecting Tomato Production in Kenya. The project aims at improving tomato production in the peri-urban tropics through development, validation and dissemination of Integrated Pest Management strategies that are effective, sustainable and adoptable to combat these menaces for tomato within smallholder farms in Kenya. The project seeks to enhance and facilitate knowledge exchange and dissemination whilst building the capacity of farmers, agricultural extension officers and other stakeholders. The project’s expected outputs are to publish catalogues and papers on diversity and identity of Tuta absoluta and Fusarium wilt-Nematode complex, develop sustainable management of Tuta absoluta and Fusarium wilt-Nematode complex within smallholder farms, increase capacity and knowledge for agricultural practitioners in integrated pest management which will improve the overall production of tomatoes in Kenya.

Research by:
Dr. George M. Kariuki
Department of Agricultural Science and Technology, Kenyatta University

Project financed by: Food & Business Applied Research Fund (ARF), Netherlands Organisation for Scientific Research (NWO)

Project title: Development, Validation and Dissemination of Integrated Pest Management Packages for Tomato Leafminer (Tuta absoluta) and Fusarium Wilt-root Knot Nematode Complex affecting Tomato Production in Kenya
Do Networks Work?

Study of the Construction and Governance of Transnational Higher Education Research Collaborations in Kenya and Uganda

Dr. Jackline Nyerere is leading a team of researchers to critically examine and evaluate the organization, policy frameworks, and governance structures associated with diverse forms of transnational research partnerships and diasporic networks in selected research organizations in Kenya and Uganda.

The team is also exploring how existing research networks interface with national innovation systems and institutional priorities. The project titled is: ‘Do Networks Work? Study of the Construction and Governance of Transnational Higher Education Research Collaborations in Kenya and Uganda’, seeks to identify and analyze the management processes, policy regimes, and governance structures as well as the key actors embedded within the interface between transnational research partnerships, institutional management structures, and national innovation systems. The study draws from multiple theoretical, conceptual, and disciplinary frameworks to provide tools for a more rigorous discussion and analysis of these issues. The research team consists of experienced researchers as well as emerging researchers hence contributing to unique capacity development of early career African academics. The research is supported by the Council for the Development of Social Science research in Africa (CODESRIA) under the African Diaspora Support to African Universities Program.
About 90% of all malaria deaths in the world today occur in Africa south of the Sahara. This is because majority of infections in Africa are caused by one of the most dangerous of the four human malaria parasites. It is also because the most effective malaria vector – the mosquito – is the most widespread in Africa and the most difficult to control.

Clarence Maikuri Mange’ra, a PhD candidate at Kenyatta University (pictured) is exploring the insecticidal properties of the curry tree (Murrayakoenigii) on anopheles mosquitoes. Curry tree is a tropical to sub-tropical tree which is native to India and Sri Lanka. Its leaves are used in many dishes in India and neighbouring countries. Often used in curries, the leaves are generally called by the name ‘curry leaves,’ although they are also literally ‘sweet neem leaves’ in most Indian languages (as opposed to ordinary neem leaves which are very bitter. In this innovative study, activity of essential oil and crude extracts isolated from the leaves of Curry tree against mosquito vectors are of interest. The repulsive activity of these essential oils and growth disrupting effects of crude extracts at small doses isolated from the leaves of Curry tree against mosquito are being investigated. The team aims to develop an original anti-mosquito blend applicable in combined vector management of malaria vectors. The blend shall be incorporated to current approaches such as treated mosquito nets and Indoor Residual Spraying (IRS) to explore an integrated approach to managing the malaria vector.

The research team will work with local communities affected by mosquito borne diseases, who have been mobilized and actively involved in propagating the plant for its medicinal, culinary and vector control applications. Efficient locally accessible phytochemicals have the potential of significant reduction of the malaria vectors, and contributing to reduction and eventual elimination of malaria in Kenya and the region. 

**NOVEL ANTI-MALARIAL BLEND**

The curry tree (Murraya koenigii)

Clarence doing lab work at the Chemistry Lab
KU researcher focused on eradicating Striga weed completely

Dr. Steven Runo from the Department of Biochemistry and Biotechnology at Kenyatta University is leading a project to identify mechanisms controlling release of Striga virulence genes as a first step toward developing breeding strategies that can be used to build durable resistance to Striga. Dr. Runo in his project titled ‘Derailing witchweed (Striga) virulence in rice to achieve durable and broad-spectrum resistance’, aims at a comprehensive assessment of the mutations or genetic variations in Striga virulence factors (effectors) as well as their role in host plants. In addition, Dr. Runo hopes to identify novel sources of Striga resistance from wild cereal relatives. An output of this project will be identification of multiple factors (effectors) that help Striga evade resistance by its host. An additional output will be quantification of how these factors are able to change with time and acquire ability to invade new hosts. Identified virulence effectors will also aid in identification of corresponding resistance genes. It is hoped that the specificity of different Striga virulence races (ecotypes) to different host cultivars will be identified. This knowledge generated in the project will directly be applied to breeding of new seed varieties that are resistant to Striga, through gene pyramiding. Since the yields of important cereal crops in Africa is on the decline due to the impact of Striga, the results of this project will have significant influence on agricultural productivity in the region and others where the parasitic plant is a problem.

Research led by: Dr. Steven M. Runo
Department of Biochemistry and Biotechnology, Kenyatta University

Project financed by: Partnership for Enhanced Engagement in Research (PEER) Science Cycle 2

Project title: Derailing witchweed (Striga) virulence in rice to achieve durable and broad-spectrum resistance

Face of the ‘cereal’ killer. Striga’s beautiful falsify its pernicious true nature
Horticultural Innovations and Learning for improved nutrition and livelihood in East Africa (HORTINLEA) is an interdisciplinary research consortia addressing food security in East Africa, particularly in Kenya. Nineteen universities and research institutes in Kenya, Tanzania and Germany collaborate to gain added value from their academic excellence and expertise. The overall goal of the consortium is to improve the livelihood and nutritional situation of the rural and urban poor is funded by the German Ministry of Education and Research.

Prof. Waceke Wanjohi, Dean, School of Agriculture and Enterprise Development and a member of the HORTINLEA Executive Board was involved in the development and successful establishment and funding of this initiative in 2014 and is the principal investigator in one of the 14 sub-projects entitled ‘Development of Integrated Pest Management Strategies for the Production of Important Vegetable Crops in Kenya’. The overall aim of this sub project is to develop integrated pest and disease control strategies for increased yield and to ensure crop quality. The project seeks to develop sustainable management strategies for a) Root-knot Nematode pests, viruses and phytoplasmas on African nightshades, b) cowpea insect pests and c) insect pests and diseases on leafy indigenous vegetables in Kenya. The projects expected outputs results will increase knowledge, develop adequate management strategies and affordable solutions, which will improve vegetable production and thereby further increase income opportunities and access to nutritive vegetables. This project is in collaboration with Humboldt-University Berlin (HUB), International Centre of Insect Physiology and Ecology (IC- IPE), Leibniz Institute of Vegetable and Ornamental Crops (IGZ), Leibniz University Hannover (LUH) and Jomo Kenyatta University of Agriculture and Technology (JKUAT).

"Under this Project we has been able to train 75PhD, 60% being Kenyans and therefore contributing to the Kenya Government efforts of ensuring 1000 PhDs are trained per year in order to improve quality of University education. Prof. Waceke”

Dr. Joseph Gweyi, a senior lecturer in the Department of Agriculture Science and Technology, also partnered with HORTRINLEA to provide knowledge on the current status of soil fertility management and to identify possible constraints for vegetable production in the peri-urban area of Nairobi due to mineral nutrients, soil organic matter (contents and heavy metals). The sub-project titled ‘Crop-specific carbon and mineral element fluxes for sustainable soil fertility and nutrient management in horticultural production systems’, aims to determine and analyze the current status and sources of heavy metal contamination of vegetables, and of crop specific plant traits regulating heavy metal contamination. The projects expected outputs results will serve as a basis for series of options and locally tailored recommendations for integrated Soil organic matter and nutrient management in horticultural production systems, and avoidance of heavy metal hazard of vegetable consumers. This project is in collaboration with partners from Humboldt-University Berlin (HUB), Jaramogi Oginga Odinga University of Science and Technology (JOOST) and Egerton University. The joint research project HORTINLEA is funded within the framework of the Programme GlobE – Global Food Security by the German Federal Ministry of Education and Research (BMBF) and the German Federal Ministry of Economic Cooperation and Development with a grant of up to 7.5 million Euros over five years.

Research by:
Prof. Waceke Wanjohi
Dean, School of Agriculture and Enterprise Development
Dr. Joseph Gweyi
Department of Agricultural Science and Technology
Kenyatta University
Baby Friendly Community Initiative.

Nutrition in the first 1000 days of life is critical for child growth wellbeing and survival. Interventions promoting optimal infant and young child nutrition (IYCN) could prevent a fifth of under 5 deaths. Cases of IYCN are rife and widely documented in Kenya like in any other developing countries. To mitigate the situation, in 2007 the Country’s Division of Nutrition developed a national strategy to promote optimal IYCN practices actualized through the baby friendly hospital initiatives (BFHI) in maternity wards. This however has not changed much as 2 out of 5 women deliver in health facilities and further IYCN practices are greatly influenced by traditional beliefs and practices hence the impact of the baby friendly hospital initiatives has been minimal.

Figure 1: One of the trainers illustrating attachment and positioning while breastfeeding

Figure 2: CHVs singing a song on breastfeeding

Recognizing the need to reach women at the community level in order to provide them with a comprehensive support system to improve breastfeeding practices and other maternal, infant and young child nutrition practices at the community level, considerations of implementing Baby Friendly Community Initiative (BFCl) have been fronted by the Division of Nutrition. The initiative which employs similar principles to the earlier hospital initiative is being piloted, solid evidence on its effectiveness, how best it works and its cost effectiveness in the Kenyan contexts are being sort to promote political buy in, budgetary allocation and effective implementation at the national level. A team being led by Prof. Judith Kimiywe – Department of Food, Nutrition and Dietetics is carrying out the pilot community trial in rural setting to determine the project’s viability. The importance of breastfeeding and optimal infant feeding promotion in child-survival cannot be overemphasized. Identification of feasible and effective strategies for promotion of optimal infant feeding is of utmost importance. The results from this trial are expected to provide evidence regarding the feasibility of implementing the BFCl in Kenya and its effectiveness on breastfeeding, morbidity from diarrhea, and nutritional status among infants. This is expected to inform policy and practice regarding child survival in Kenya and other Low and Middle Income Countries (LIMCs). It is expected to inform the roll-out of the BFCl in Kenya and other LIMCs where it is under consideration, which goes beyond the BFHI to promote optimal breastfeeding and other infant feeding practices at the community level.

Research by
Prof. Judith Kimiywe
Department of Food, Nutrition and Dietetics, School of Applied Human Sciences
Project financed by: National Academy of Sciences

Food Security, Economic Empowerment, Improved Livelihoods all rolled up in Indigenous Chicken Value Chain.

The indigenous chicken (IC) production is an important agricultural activity in many households, it constitutes 80% of the total poultry population in Kenya. Prof. Lucy Kabuage, an animal production specialist at the Department of Agricultural Resource Management in the School of Agriculture and Enterprise Development in Kenyatta University was awarded a competitive research grant by the Kenya Agricultural Productivity and Agribusiness Programme (KAPAP) for a 3 year project entitled ‘Enhancing Indigenous Chicken Value Chain (ICVC) for higher productivity and bio-secure products in Makueni’.

The project has distributed 2000 one month old, high quality improved indigenous chicks to 88 project nucleus farmers and 112 satellite smallholder farmers in Makueni County. The project aims to further distribute over 3000 chicks. Three indigenous chicken model houses have been constructed in Makueni County, at Wote and Salama study sites. Some farmers have been trained on proper housing, bio-security and poultry health using the model house at Salama site. Some of the project farmers have also been trained on feeding their indigenous chicken on balanced feed supplements, formulated and mixed on farm at the Wote site. The training used feed ingredients such as sorghum grown by the farmers. Planting seeds for both sorghum and sunflower, and fertilizer were distributed to the farmers to plant for feed production. The project has additionally trained some of the farmers on flock management, breeding and brooding practices, disease and parasite control as well as Indigenous Chicken housing, bio-security and chicken feed production. Post-graduate students conducting Indigenous Chicken marketing surveys have also benefitted from Professor Kabuage’s Project.

Researcher:
Prof. Lucy Kabuage
Department of Agricultural Resource Management
Kenyatta University
Kenyatta University Bird Project club, held its first workshop on 7th October 2016. The aim of the workshop was to enlighten the University fraternity on the importance of birds in the ecosystem and to emphasize their importance in research. The event was graced by Ms. Fleur Ng’weno, one of the world’s best ornithologists based at Nature Kenya and a well-known birder, gave a presentation on “Birding experiences from the Nairobi Bird walk Team”, where she highlighted the myths about birds and how communities have long used birds as indicators of various cues and hence of great value in our African communities.

Dr. Jemimah Simbauni a Senior Lecturer at the Department of Zoological sciences and a birder also made her presentation entitled “Introduction to Birding in Kenya”, where she explained the birding diversity in Kenya and the world at large, taking cognizance of both the endemic and migratory bird species that traverse our country. She also expounded on the importance of birds in research and concluded her talk with some fun facts and records about birds globally.

Several organizations were represented at the workshop including: Nature Kenya, The East Africa Natural History Society (EANHS) and Kenya Museum Society (KMS).
Kenyatta University Hosts International Conference to Discuss Physical Activity and Sports for Health and Development in Africa

Kenyatta University hosted the 2nd International Conference on Physical Activity and Sports for Health and Development in Africa (PASHDA) from 21-23 September 2016. Under the theme was “Promoting Physical Activity and Sports for Health and Development in Africa”, the conference attracted over 200 participants from Europe, Canada, West Africa, South Africa and Eastern Africa, where a range of research experts, academicians, former sports men and practitioners presented their viewpoints within discussion panels, and several sub-sessions.

The conference included several important sub-themes: physical activity for health and nutrition; psychosocial issues in physical activity and sports; physical activity in prevention and management of non-communicable diseases; gender issues in physical activity and sports; exercise and fitness and physical activity and the environment.

The conference opening ceremony was presided over by Sport Kenya Director General Gordon Oluoch who represented the Cabinet Secretary for Sports, Culture and the Arts Dr. Hassan Wario. Among those in attendance included Kenyan veteran athlete and two time Olympics champion Dr. Kipchoge Keino and the 1978, 800m Commonwealth champion Prof. Mike Boit.

The conference was sponsored by Kenyatta University, The Coca Cola Company, Kenya National Commission for UNESCO (KNATCOM), Nairobi Sports House, KAM Pharmacy, National Commission for Science, Technology and Innovation (NACOSTI), Safaricom and StepsCount.

The conference provided a unique opportunity for participants to share knowledge and experiences on all aspects of physical activity, sports, health and development. Over 130 scientific papers were presented at the conference. Five panels of two to three speakers each were lined up, to run in parallel sessions of three. They covered a broad range of areas of physical activity and sports. The conference keynote speakers were:

- **Prof. Mark Tremblay**
  The Director of Healthy Active Living and Obesity Research (HALO) and a Professor of Pediatrics in the Faculty of Medicine, University of Ottawa.

- **Prof. Antonio Prista**
  Professor at the Faculty of Sports Sciences, Universidade Pedagógica, Mozambique.

- **Dr. Constance Nsibambi**
  Head of the Sports Science Department at Kyambogo University, Uganda.
Researchers Trained on Research e-Infrastructure

Kenyatta University researchers were trained at different forums on Research e-Infrastructure, from 14th to 19th October, 2016. The trainings were facilitated by Kenya Education Network (KENET) in partnership with the KU Division of Research Innovation and Outreach. The half-day trainings aimed at creating awareness on the advanced global e-infrastructures available to Kenyan Researchers whose institutions are linked to KENET network.

In attendance were Deans, Chairmen of Departments, and research champions representing each teaching department within the University. KENET is a National Research and Education Network that promotes the use of ICT in teaching, learning and research in institutions of higher learning across the country, by providing affordable, cost-effective and low-congestion internet bandwidth services to its member institutions in Kenya. It is also a gateway to the advanced research e-infrastructures available exclusively within the research community anywhere in the world.

Researchers learned how to effectively use bibliometric analysis and other research analytics tools to identify research collaborators/ partners. Research e-infrastructures empower researchers with easy and secure online access to facilities and resources and enabling them to deliver reusable and reproducible research and innovation outputs.
Kenyatta University hosted the 2016 Society for the Advancement of Science in Africa (SASA) Conference from 23rd to 26th August 2016. The theme of the Fourth International Annual Conference was “Advancing Africa’s Sustainable Development through Science, Technology and Innovation”. It sought to advance science, improve health, and economic and social development on the African continent. The conference included several important sub-themes such as engaging international science & technology collaborations, promoting science & technology research, translating academic research to innovations, accelerating infrastructural development, transforming the academic curriculum for advancing science, technology and innovation and harmonizing country-to-country variations in science policy as well as government funding of research.

The conference attracted participants from Europe, Canada, West Africa, South Africa and Eastern Africa, where internationally recognized authorities presented their viewpoints within discussion panels, and several sub-sessions including poster sessions featuring scientific presentations with over 80 scientific papers were presented at the conference.

Prof. David W. Dunne Director, Wellcome-Trust-Cambridge Centre for Global Health Research CAPREx, THRIVE – Cambridge & Cambridge - Africa of the African Cambridge delivered the international keynote address on “Creating a Globally Competitive University Sector in Africa”.

Prof. Leon Mutesa focused on “Advancement of Genetic Activities in Rwanda: Achievements, Challenges and Perspectives” whilst Prof. Thomas G. Egwang presented on “Malaria Vaccines in the Era of Malaria Eradication and SDG3.3.”
Promoting Research visibility through Open Access and Institutional Repositories at Kenyatta University

Institutions of higher learning want to have their research visible in order to enhance their academic rating. Some of the popular ways to improve research visibility include: publishing in journals, both commercial and open access; presenting findings in the conferences and workshops; uploading in institutional repositories; sharing in academic social forums; and sharing reports with colleagues.

Publishing in scientific journals has been the avenue for visibility and future citation. However to publish, article must undergo rigorous review process which adds to costs and time before it is accepted. As a result this has led to high rate of rejection by publishers, delays in getting feedback, high fees charged by some publishers and authors are unable to identify the suitable journals to publish in. Similarly presenting papers in conferences too has been a challenge too due to high fee which include conference fee, travel and subsistence costs, and authors are never sure that they will be included to present.

In the light of the above, the open access movement has significantly tried to address these challenges by offering three significant alternatives: institutional repositories, open access journals and academic social forums. Institutional repository is a kind of service that provides a facility to deposit, preserve and enable online visibility and access of publications by members of an institution or documents on the institution. Institutional repositories use internationally accepted standards that allow Interoperability and harvesting of metadata by web search engines such as Google. Some documents in an institutional repository include research findings, conference presentations, theses and dissertations, books and reports. Policies and procedures regarding use are usually institutional based that makes easy for researchers and writers to publish their publications that meet the required criteria. For example some institutions allow members to self-archive their work.

Open access journals provide online free access to publications without financial restrictions such as subscription fees, licenses or pay-per-view costs. Articles undergo similar review just like in the commercial journals and authors are informed appropriately. These journals are usually sustained financially by charging author fees, donations, professional bodies or support by respective institution. In the recent past, open journals have significantly increased in number and they provide a great forum for research to have their research visible globally. The other alternative is sharing research in social academic forums. These forums require the author to register joining a discussion group or specialized subject group where they are free to share research finding and discussion. Through this visibility in research finding is enhanced however control of posting may have some quality challenges. Therefore for promoting research visibility and wider access writers should endeavor to publish in institutional repositories or open access journals.

Dr. Gitau Njoroge, Chief University Librarian
Kenyatta University hosted the 1st Biennial Conference whose theme was ‘Quality University Research and Innovation’. The conference was graced by esteemed leaders and Vice-Chancellors from different regions of the country and the world.

The Acting Vice-Chancellor, Prof. Paul Wainaina, welcomed the guests and appreciated them for their support and participation in the Biennial conference. He urged everyone to utilize the opportunity of the Biennial Conference to learn more and come up with solutions to solve the problems and hindrances affecting the state of Higher Education.

Speaking during the event, the Cabinet Secretary, Ministry of Education, Dr. Fred Matiang’i, explained that the main purpose of the conference was to discuss the state of higher education. He emphasized the need for culture change if we are to succeed in the higher education sector. Culture change will enable progress in the Education sector. He urged people to work extra hard and change for the better.

In addition, he singled out some of the matters for discussion, such as student enrollment and the need to finance higher education programmes. He reminded participants that out of a possible two thirds of students graduating from high school, only a third make it to institutions of higher learning. Furthermore, the Cabinet Secretary invited stakeholders, private enterprise and other parties to invest in vocational and technical training; tertiary education.

The Cabinet Secretary cited some of the challenges affecting the higher education sector as being the imbalance between the Arts courses and the Science courses. This occurs when the number of students pursuing the arts courses seem to be at a higher percentage compared to those pursuing the science courses. The Cabinet Secretary emphasized the importance of ensuring balance in both type of courses. He also noted that institutions of higher learning were not performing well. He urged the Vice-Chancellors of the different Universities to put in strategies that will ensure improvement in performance at the universities.

Kenyatta University Hosts the Regional Centre of Expertise Conference

Kenyatta University hosted the 6th African Regional Centre of Expertise (RCE) Conference on Education for Sustainable Development (ESD) from 24th to 26th August 2016. Organized by United Nations University-Institute of Advisor Study of Sustainability (UNU-IAS) in collaboration with NEMA and RCE Greater Nairobi, the conference addressed the role of Africa RCEs in implementing the GAP of ESD and the Sustainable Development Goals (SDGs).

The theme of the conference was: Developing Capacities of African RCEs for the Implementation of the Global Programme on ESD and the Achievement of Sustainable Development Goals (SDGs).

The purpose of the conference was; Developing Capacities of African RCEs for the Implementation of the Global Programme on ESD and the Achievement of Sustainable Development Goals, focusing on capacity building within African RCEs in relation to the international frameworks. The 6th African RCEs conference sought to increase the visibility and relevance of RCEs across Africa, with a wider global stakeholder participation. It aimed at building a common agenda for African RCEs and to chart a common vision on implementing the Global Action Programme on ESD and SDG4. The conference gave a platform for African RCEs to develop concrete and achievable joint action plans and opportunities for sharing ESD experiences as part of social learning.

The conference was graced by Mrs. Binta Mamman Suleiman (Member of Niger state House of Assembly) from Nigeria who pledged to lobby for the Nigerian government’s support towards RCE initiative. There were also presentations from African youth leaders from RCE Minna, Nigeria, RCE Greater Pwani, Kenya and RCE Massaca, Uganda. The conference ended with the election of a new African RCEs Chairman Dr. Abdul Hussaini (Nigeria) and his vice chair Dr. Marleen Chikuni (Malawi).
**VISITING SCHOLARS AND FELLOWS**

**Ms. Lisa Mauritz**

Ms. Lisa Mauritz is a DAAD-sponsored lecturer at the Department of Foreign Languages where she is teaching German. Ms. Mauritz earned her M.A. in German studies and German as a Foreign Language from Bielefeld University in Germany, conducting a qualitative study in Nepal about the opinions of Nepalese German learners on creative writing in the German class. At Bielefeld University she taught Graduate-School-Courses (German courses for doctoral candidates in English speaking study courses). After having completed her M.A. studies, she worked as DAAD-language assistant at the Université de Yaoundé in Cameroon. There she worked on a project, Scientific writing at Universities in Yaoundé/Cameroon by training a team how to hold workshops on scientific writing and to give writing consultancies. Lisa Mauritz’s stay at KU is funded by the DAAD-lecturer-programme. The DAAD is the world’s largest funding organization for the international exchange of students and researchers.

**Prof. Miriam O’Kane Mara**

Prof. Miriam O’Kane Mara from Arizona State University is visiting as a Fulbright scholar at the Department of Literature. During her visit, Miriam will share her vast knowledge and research interests in literary theory, transnational discourses, comparative literature and postcolonial spaces with both the faculty and students. Prof. Mara earned her Ph.D in English from University of New Mexico, M.A in English from University of North Carolina. In addition to holding various academic and administrative positions, Prof. Mara has received several academic honors and awards, research and fellowship grants in recognition and support of her scholarship. Prof. Mara is also well versed with the conference circuit, having presented more than thirty papers in conferences around the world, published several refereed journal articles and book chapters. During her stay Prof. Mara will teach postgraduate students, provide supervision and mentorship.

**Dr. Jackline Nyerere**

Dr. Jackline Nyerere a Senior Lecturer in the Department of Educational Management, Policy and Curriculum Studies is on sabbatical placement as a Knowledge Translation Scientist at the African Institute for Development Policy (AFIDEP), a policy think tank based in Nairobi. During her sabbatical, Dr. Nyerere will be leading education projects particularly three case studies on integration of transferable skills into secondary and TVET education curricula in Africa. The case studies were commissioned by the MasterCard Foundation to document and share experiences on how different types of transferable skills have been incorporated into formal education systems in response to the issue of youth unemployment and under-employment. AFIDEP’s goal is to translate and enable the utilization of evidence in policy-making in Africa, primarily in the fields of population change and sustainable development, education and health systems, and thus, the sabbatical placement has provided an invaluable opportunity to Dr. Nyerere to get knowledge and experience in bridging the gap between research, policy and practice to address development challenges.

**Prof. Howard Alper**

The University was privileged to host Prof. Howard Alper a distinguished University of Ottawa Professor and a re-known Chemist with interest in spans organic and inorganic chemistry, with potential applications in the pharmaceutical, petrochemical, and commodity chemical industries. Prof. Alper a winner of several prestigious awards has authored over 550 papers and has thirty-seven patents among many other accolades, gave a public lecture entitled, “Shaping the Future of a Nation Through, Innovation, Science, and Technology”.

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Inaugural Publication from the Division of Research Innovation and Outreach
December 2016
Kenyatta University Staff Awarded the CIRCLE Visiting Fellowship

In October 2016, Kenyatta University staff Dr. Christine L. Majale and Dr. Joseph K. Kurauka won the prestigious Climate Impact Research Capacity and Leadership Enhancement (CIRCLE) Post-Doctoral Visiting Fellowship. The two were selected as the CIRCLE 2017 Visiting fellows for a one-year climate oriented research and career development program starting January 2017. The CIRCLE programme is an initiative of the Department for International Development (DFID) of the United Kingdom (UK) to develop the skills and research output of early career African researchers in the field of climate change and its local impacts on development, and is implemented by the African Academy of Sciences (AAS) and the Association of Commonwealth Universities (ACU).

Dr. Kurauka, a lecturer in the Department of Environmental Studies and Community Development will be hosted at the University Of Dar es Salaam, Tanzania working closely with Prof. Salome Misana. His research will focus on ‘Agroforestry-Based Biofuel Systems: Creating Integrated Food-Energy Systems in East Africa’. Dr. Majale a lecturer in the Department of Environmental Planning and Management and a registered and licensed Lead EIA expert with Kenya’s National Environment Management Authority, will be hosted at the University of South Africa. Her research will focus on ‘Contributions of Plastic Waste Innovations to Green House Gas Reductions: Role of Informal Sector’.

Kenyatta University will host a visiting fellow from Kwame Nkrumah University of Science and Technology, Ghana. Dr. Daniel Nyandu will be hosted in the Department of Geography and supervised by Prof. Chris Shisanya where he will be undertaking his research project ‘Collection, Characterization and Evaluation of Farmers’ Landraces of Maize (Zea mays L.) for Adaptation to Climate change in Ghana’. As the tenure of each fellowship is 1 year, the CIRCLE visiting fellows will be based at the host institutions until December 2017 after which they will return to their home institutions, to continue their research.

Carnegie African Diaspora Fellowship Program

Dr. Joshua M. Muia serves as an Instructor in the Department of Medicine at Washington University. Dr. Muia graduated with a B. Sc. (Chemistry) degree from the University of Nairobi in 2004, and went on to attain his Ph.D in Bioinorganic Chemistry from Western Michigan University. His doctoral thesis investigated the copper-transporting ATPase (ATP7B) that is deficient in Wilson disease, during this period he developed skills in the use of DNA recombinant technology to express and purify recombinant proteins on a large scale, and biophysical characterization of proteins using circular dichroism, light scattering and gel chromatography techniques.

Dr. Fredrick Muyia Nafukho serves as Professor and Department Head in the Department of Educational Administration and Human Resource Development, College of Education and Human Development at Texas A&M University. Dr. Nafukho earned his Ph.D. in Human Resource Development from Louisiana State University, M.Ed in Economics of Education and B.Ed in Business Studies and Economics from Kenyatta University, Kenya. He attended Harvard’s Management Development Program (MDP) offered by Harvard Institutes for Higher Education. He joined the Department of Educational Administration and Human Resource Development at Texas A&M University as an Associate Professor in August 2007.