

## **RESEARCH AND DEVELOPMENT DIVISION**

### **Vision**

To be a leader in addressing community socio-economic needs through research and innovation.

### **Mission**

To provide leadership in research and innovation for social and economic empowerment.

### **STRATEGIC OBJECTIVES**



## MESSAGE FROM THE VICE-CHANCELLOR

In realization of the importance of Science, Technology and Innovation (STI) towards the National social economic growth, towards this endeavour Mount Kenya University (MKU) continues to invest heavily in research and innovation. Recently, the University established a Research, Enterprise and Innovation Development Centre (REIDC), which houses a multi-million state of the art innovation and incubation hub and a fully operational research Centre. REIDC has three incubation programmes thus: Technological, Hospitality and Microfinance Incubation Programme. Additionally, the university has established an innovation and enterprise Centre that will house the “Workforce Transition Program” (WTP) initiatives meant to equip MKU graduates with relevant and adequate skills to make them competitive in the job market. WTP aims to address graduate unemployment by actively promoting a paradigm shift in Kenya from the premise of “university education for employment” to “university education for job creation”. Other than physical infrastructure, in the year 2013 the University invested heavily in Research, Innovation and Enterprise activities. For instance, about Ksh. 6 million was spent to organize an International Conference at Safari Park, the first of its kind that drew participants from around the world. Additionally, slightly over Ksh. 16 million was allocated to Research & Development Division to execute its mandate. These monies were used to fund research projects, support members of staff to attend local and international conferences, organize capacity building workshops and carry out community research. These and other investments have started to bear fruit. For instance, the University published over **100 publications** in peer reviewed journals. The University will therefore continue to support STI activities an important catalyst towards the realization of Vision 2030.



## MESSAGE FROM THE DEPUTY VICE-CHANCELLOR

Welcome to the third edition Mount Kenya Annual Research and Innovation Bulletin. Mount Kenya University has continuously attracted funding from external donors as well as invested in research by the establishment of the Vice-Chancellor’s Research Grant.

The University has attracted grants from The Association of Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), Kenya Agricultural Productivity and Agribusiness Project (KAPAP), Third World Academic Sciences (TWAS), National Council of Science and Technology (NACOSTI), International Society for Infectious Diseases (ISID), Government of Japan, International Foundation for Science (IFS), through Prof. John H. Nderitu, Dr. Francis Muregi, Dr. Samuel Odiwour, Dr. Jesse Gitaka, Raphael Mulaha and Mr. Alex Kiragu respectively. The grants vary from Research, Innovation and Post-doctorate research. Mount Kenya University VC Research and Innovation Grant have up to date 60 beneficiaries who are currently undertaking research in the University. The University has spent 12 million for the last two year to build capacity of researchers in the University. The university has in the year 2013-2014 invested 10 million in the grant that will see the number of beneficiaries double.

## Message from the Director



### Messages from the Deputy Director, Research & Development

Kenya has certainly made incredible strides in the expansion of post secondary education in the last decade. To date, there are more than 40 Universities in a Country with an estimated population of slightly over 40 million people. Unfortunately, that phenomenon growth has not been matched with growth in Research & Innovation. The government has certainly demonstrated goodwill through increasing research and innovation funding to about 400 million per annum. This

amount is by law expected to grow to about 2% GDP. Establishment of Mount Kenya University Research Enterprise & Innovation Development Centre (REIDC) is a clear demonstration of how receptive the University management is to local and national agenda. In addition, the Research Division has been facilitated to hold several public lectures and trainings in Research Methods, Intellectual Property Rights, and Biosafety issues. At the Research Centre, current efforts are geared towards implementation of the programs envisioned in the Research & Development Division Strategic Plan 2008-2018. To this end, installation of key research

equipments including Atomic Absorption Spectrophotometer, Gas Chromatography machine and High Performance Liquid Chromatography spectrophotometers as well as functional fume chambers equips research staff and postgraduate students with valuable equipments that are expected to support high quality research. The year 2014 certainly is the year of implementation. Projects on Non-Communicable Diseases, Natural Products and Pharmaceutical Research have been initiated. There has been concerted efforts to develop several protocols to raise requisite funds for the implementation of the Research Agend. I see Mount Kenya University Research Centre providing solutions to problems in health, water & sanitation as well as initiating development of at least one products in 2014.

### Messages from the Deputy Director, Enterprise & Innovation

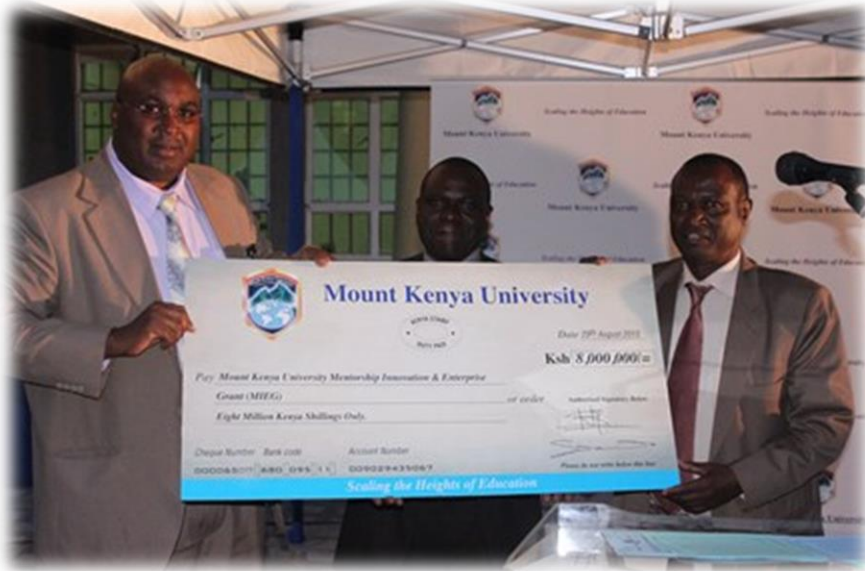
### Messages from the HOD's



## **NEW PROGRAMMES**

### **1. MOUNT KENYA UNIVERSITY LAUNCHES ENTERPRISE ACADEMY**

Mount Kenya University has established the “**Workforce Transition Program**” (**WTP**) meant to equip its graduates with relevant and adequate skills to make them competitive in the job market. **WTP** aims to address graduate unemployment by actively promoting a paradigm shift in Kenya from the premise of “University education for employment” to “University education for job creation”. university has established **Research, Enterprise and Innovation Development Centre (REIDC)** whose motto is “**transforming job seekers to job creators**” with the ultimate aim of aiding the Kenyan youth participate in job and wealth creation through nurturing innovative business ideas as well as commercialization of innovations to address socio-economic challenges of our society. The University has also established an **Enterprise Academy** to bridge the chasm between knowledge generation and knowledge utilization. The Academy has received a generous initial 5-year funding from the University management through injection of KSh. 40 million into the MIEF.



*Mr. Simon Gicharu, Chairman BOT hands over a dummy cheque of Ksh. 8 million to the Deputy Vice-Chancellor, R&D. With them is the Vice-Chancellor.*

From the fund, a total of 10 young apprentices (innovators/entrepreneurs) will benefit with initial seed grant of KSh. 800, 000 per year for every innovative business idea. It is envisaged that the Academy will spur the discovery and development of new knowledge and its subsequent exploitation for the socioeconomic development of the Kenyan people and the region in line with the objects of Kenya Vision 2030.



*A section of MKU alumni who had applied for the Enterprise Academy awaiting interviews.*

**INAUGURAL ENTERPRISE ACADEMY APPRENTICE**

NAME	BUSINESS	CLASSIFICATION
------	----------	----------------

1.	Mr. Godffrey Ngotho Ng'ang'a	Kipacha Technologies	Web Design and Consultancy
2.	Ms. Stellamaris M Kathomi	Stejos Tours and Travel	Camping
3.	Ms.Lilian Kawira	Lilac Body Care (LBC)	Manufacturing
4.	Mr. Bernad Wanjau	Friends of Farmers Initiative	Agro-extension Services
5.	Mr. Stephen M Opana	Malala Creative Production	Media Services
6.	Mr. Mwangi Paul Mwago	Fun2Venture Gaming Cafe	Simulation Video games
7.	Ms. Faith Kinya	Faz Luminous	Jewelery & Bead Making
8.	Mr. Peter Buluma	Royal Family Cleaners	Hygiene Services
9.	Mr. John Murei	Eldoret Petty Errands	Messenger Services

The University is concerned that start-up businesses by young graduate entrepreneurs cannot secure start-up capital for their businesses since they do not meet financing requirements by most financial institutions in Kenya such as collateral. This, coupled with success stories of previous beneficiaries of the university support, has prompted the University to establish a Kshs 40 million Mentorship, Innovation and Enterprise Fund (MIEF) to fund student innovators/entrepreneurs under WTP. Each year, the Programme will fund 10 graduate students with promising innovations/business ideas to the tune of Kshs 800,000 each.

## 2. Enterprise, Incubation and Mentorship Programme

Achievement of Kenya Vision 2030 is grounded on the premise that the learning institutions will produce Kenyans who are creative and have enterprising minds. Mount Kenya University realizing this fact established the mentorship programme which is currently housed in the recently constructed Microfinance and Incubation Centre. **Dr. Cheseto to beef this up!**



*PICTURE: Students who were presenting their business and innovation ideas for incubation for the Enterprise and Incubation Programme*

Inaugural Business and Innovation Mentorship Entrants:

NAME	DEPARTMENT/CAMPUS	TITLE OF BUSINESS/INNOVATION
Daniel Macharia	Thika	Green smartphone, digital smart products
Evans Chepkwony	Thika	Kenya county website
Laura M. Munyazi	Thika	??????
Peter M. Githaiga	Thika	Agriculture
Dennis Miriti	Thika	Burn wound healing using chitosan & miramistin gel
Newton M.P. Githinji	Thika	The stocktrader application software
Alex M. Munene	Thika	The owner
Martin Mugi	Thika	Summley portal
Doris Ngibeyo	Lodwar	Raising chicken
Abraham G. Mbogo	Virtual	Breaking the box TV show
Kimani Muthoni	Nakuru	An online tender system
Jackson Macharia	Nakuru	End of cattle rustling (GPS technology)
Antony Ndungu	Nakuru	Intergrated police information system
George Maina	Nairobi	Retailing using vender machines
Kevin Sirengo	Nairobi	Bunny's investment

### **3. Launch of Mount Kenya University Research and Innovation Students Association (MKURISA) and Mount Kenya University Innovators Platform (MKUIP)**

Mount Kenya Research & Development Division facilitated launching of MKURISA, a student based association aimed at promoting research and innovation culture at the university and MKUIP, an innovators platform with membership drawn from Alumni. The wisdom behind these two initiatives is the realization that many a times, students have brilliant ideas but lack a good platform to express those ideas and have them cultivated and actualized. MKURISA was formed by students in March 2013 in consultations with MKU Research & Development division to mobilize students to engage in research and innovation activities. So far the association has enrolled over 200 members.



*MKU Chancellor, Prof. Victoriah Wulsin and Prof. Raj Mehta Vice Provost University of Cincinnati officially launch Mount Kenya University Research and Innovation Students Association (MKURISA)*

**Peter: Can we get the photo that has the Chancellor literally unveiling the banners?**



*Students, staff and guest take a group photo after launching MKURISA and MKUIP*



*University of Cincinnati Vice Provost, Prof. Raj Mehta speaks on role of research and innovation on development during the official launch of the students association*

### **MKURISA Students visit other incubation programmes**

Trips to IBM, iLab & Kirdi

(Peter to provide this info in consultation with Dr. Cheseto/retrieve the visit report)

# RESEARCH & INNOVATION

## ENHANCING RESEARCH & INNOVATION CAPACITY

### a) Establishment of Enterprise, Microfinance & Innovation Facilities.

The Research Division has established an Enterprise & Microfinance Centre as well as an Innovation Centre. These facilities renovated at approximately Ksh. 5 million, will house the mentorship programme where students with innovations or business ideas will be mentored and trained. These facilities have already been equipped with the necessary infrastructure; furnitures, computers & internet. The first batch of students are expected to report in 2014.

Peter: Include photos of Microfinance and Incubation Centre. Ndumia has already sent us those photos

### b) Installation of Research Equipments at the Research Centre

MKU Research Centre received a major boost when the equipments that had been delivered previously were installed. Among the equipments that were installed include Atomic Absorption Spectrometer (AAS), Gas Chromatography (GC), High Performance Liquid Chromatography (HPLC), Fully automated hematology analyzer and PCR. These equipments will be instrumental in the implementation of the Research Agenda outlined in the 2008-2018 Strategic Plan..

### c) Kwanza Field Research farm.....this is more of community outreach just like KEFRI training

- Bee keeping
- Livestock
- Fish aquaculture
- Rabbits
- Crop demonstrations



**FIRST INTERNATIONAL RESEARCH AND INNOVATION CONFERENCE, Aug 28-30<sup>th</sup> 2013**

The pivotal role research, innovation and other intellectual activities play in socio-economic development of any society can never be gainsaid. Mount Kenya University firmly believes that socio-economic needs of Kenya and the region can only be met through a knowledge economy largely driven by research and innovation. It is in this backdrop that Mount Kenya University, held an International Conference whose theme was; *Towards Achieving a Knowledge Economy through Research and Innovations*. The two-day conference brought together over 700 local and foreign researchers, exhibitors and innovators from the industry, academia, research institutions and policy makers who disseminated and exchanged their scholarly knowledge. The conference was supported by the following sponsors; Nation Media Group (NMG), FOTON East Africa, Standard Group (SG), National Commission for Science, Technology and Innovations (NACOSTI), Equity Bank, Kenya Broadcasting Corporation (KBC), and The Star.

During plenary sessions, 11 keynote speakers drawn from the academia, business community and from key government institutions gave excellent talks. Thematic areas covered at the conference included Human health, Pure and applied sciences and Socio-economic. The Guest Speaker Prof. Jacob T. Kaimenyi, Cabinet Secretary, Ministry of Education, Science and Technology officiated the opening ceremony of the conference. His speech addressed the role of Science, Technology and Innovation (STI) and it highlighted various issues some of which have been redacted below. On the overall of STI in turning around economies, Prof. Kaimenyi said the following; “World over, one of the key drivers of growth has definitely been innovation. The creation, dissemination and application of knowledge have become a major engine of economic expansion. The successful economies have come to rely more and more on this precious development tool. Innovations are today's the crucial source of effective competition, rapid economic development and transformation of the society. I'm greatly, encouraged that this University, chose to base the theme for this year's conference on innovation undoubtedly the capability to innovate and to bring innovation successfully to market has been a crucial determinant of the global competitiveness and will remain a key factor for nations over the coming decades.”

On the government efforts to mainstream STI issues, the Cabinet Secretary stated the following;

“The current policy framework hinged on Science Technology and Innovations policy of 2012, provides a bases for harmonized and coordinated approach to create a robust knowledge-based economy. Equally important will be creating the enabling environment to apply these skills into productive and innovative competencies and opportunities for technological learning particularly within industry and business enterprises. To promote the generation of knowledge and its application, the strategies will involve introducing innovation and creativity in all post-secondary education and training institutions and promote research in strategic areas. To facilitate this, the relevant act of 2013 was enacted resulting to elevation of National Council for Science and Technology into National Commission for Science, Technology and Innovation (NACOSTI) and the approval of 2% national GDP to be allocated to Science Technology and Innovations. These are major milestones in promoting Innovation for economic development”



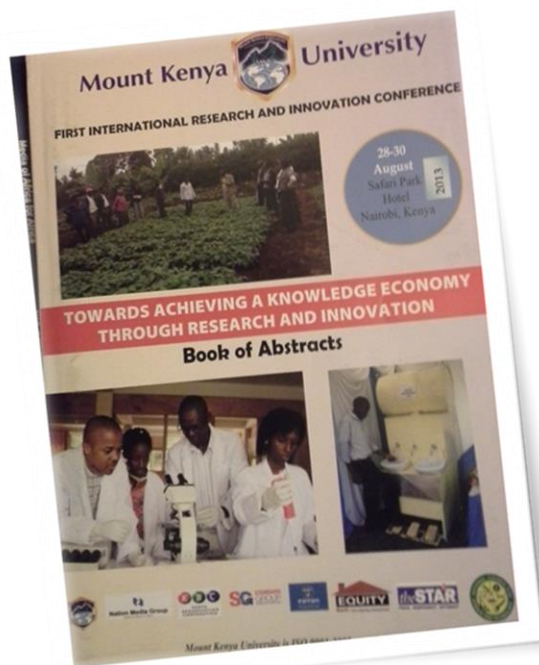
*Prof. Jacob Kaimenyi, Cabinet Secretary  
Ministry of Education during the  
Conference opening ceremony.*



*Participant take a group photo during the first International Research and Innovation Conference held at Safari Park Hotel*

## CONFERENCE HIGHLIGHTS

### Conference Publications



**Pictorial of Keynote Speakers**



**Mr. Joseph Ogutu, Safaricom**



**Prof. Michael Koech, KU**



**Mr. Kinuthia Wamwangi, TA**



**Prof. Shaukat Abdilrazak, NACOSTI**



**Dr. Julius Kipng'etich, Equity**



**Prof. Chacha Nyaigoti Chacha, Pro-Chancellor, MKU**

## Paper Presentations

Peter working on this...

## Posters Presentation

The following posters were presented at the Conference.

1. Moga D. Antioxidant Properties of Selected Kenyan Medicinal Plants Used in the Management of Cancer.
2. Amadi EK. Assessment of Heavy Metals and Nutrients Loads in Water Soil and Sediments Samples along Sosiani River, Kenya.
3. Asemota OO. Childhood Obesity in Kigali: A Three-Level Approach for Cost-Effective Reduction Interventions.
4. Kipkoech DN. Determinants of Farmers' Participation in Contract Farming in Kenya: Case of Potato Production in Bomet District.
5. Kaoga J. Effect of Farm Pesticides on the Water Quality of Lake Naivasha.
6. Oling'a TD. Effective Leadership: Determinant of Culture, Age and Gender in Eldoret Town.
7. Ronald O. Efficacy and Safety of *Vernonia Hymenolepis* A Plant Used in Kenya for Oral Health.
8. Mutai VK. Emerging Trends in Multimedia Applications.
9. Mwaura MM. Enhancement of Pumpkin (*Cucurbita Moschata* Duchesne) Yields Through Supplementary Irrigation and Leaf Harvesting Intensity Management.
10. Otieno S. Evaluating the Performance of Different Potato Cultivars On-Station and in Farmer's Field in Kenya.
11. Mburu DK. Green Supply Chain as a Solution to Environmental Degradation.
12. Oroko DO. Improvement of the Kenyan Universities' Curricula to Make Kenya An Information Technology (It) Hub.
13. Oyugi HO. Improving Steam System Performance with Fluidized Bed Boilers.
14. Rukenya ZM. *In vitro* Antimicrobial, Cytotoxic Activity & Phytochemistry Properties of *Aloe Turkanensis*, A Plant Used in Turkana, Kenya.
15. Oyie NO. Mobility-Aware Algorithm: A Resource Allocation Scheme in Femtocell Networks.
16. Abong' GO. Potential Food Safety Concerns in Fried Potato Products in Kenya.
17. Gathii KJ. Resource Leakage, Availability and Segregation of Duties in Accounting Departments of Secondary Schools: A Case of Nakuru County.
18. Kabag TM. Role of Deputy Principals as Perceived by Principals, Deputy Principals and Teachers of Public Secondary Schools in Nyamache District, Kenya.

19. Njagi KL. Strategic Role of Location In Building Competitiveness: A Case of Automobile Industry In Kenya.
20. Ogal JO. The Effect of Level of Teachers' Job Satisfaction on Academic Performance Among Secondary Schools in Homa-Bay County, Kenya.
21. Machina BK. Truth and Justice in Kenya: A Critical Perspective.
22. Kamunde FN. Education for All (EFA) remain elusive for pastoral communities: A case of Laikipia North District.
23. Cherop PMK. Prevalence and Causes of Anemia in Pregnant Women in Kakamega: A Case Study of Emusanda Dispensary.

## Posters Corner



Exhibitions Corner



## INNOVATORS

INNOVATOR	INNOVATION
Kiragu A.	Hygienic Hand Wash Unit.
Thairu G.	Domestic Waste Biogas System.
Macharia D.	Mobile Traffic Enforcement System-M-Traffic.
Kiragu A.	Thermo derived power supply.
Mithamo P.	Design and Performance Evaluation of a Solar Poultry Egg Incubator.
Ondiek R.	IKO phone
Kiragu A.	Pneumatic Utensils Dryer.
Oduory A.	Extraction of Fragrances from Lemon Grass.
Gakuru J.	Automation of home appliances using the mobile phone

## PARTICIPANTS' PERCEPTION OF THE CONFERENCE

The perception of the conference was evaluated from the feedback forms filled anonymously by the conference participants.

**Table 1: Summary of participants' perceptions about the conference. Values in parentheses indicate the percentages.**

Evaluation Parameter	Rank				
	Poor	Fair	Good	Very good	Excellent
Quality of research papers presented	0	7 (5.2)	33 (24.4)	44 (32.6)	51 (37.8)
Organization of sessions and panel discussions	0	10 (7.4)	23 (17.0)	46 (34.1)	56 (41.5)
Extent to which conference provided you with new knowledge and ideas	0	8 (5.9)	19 (14.1)	50 (37.0)	58 (43.0)
Venue of conference	0	2 (1.4)	10 (7.4)	28 (20.7)	95 (70.4)

Conference materials provided	2 (1.5)	7 (5.2)	19 (14.1)	30 (22.2)	77 (57.0)
General arrangements of the conference	0	2 (1.5)	25 (18.5)	49 (36.3)	59 (43.7)
Hospitality of conference organizers in general	0	3 (2.2)	11 (8.1)	44 (32.6)	77 (57.0)

## Summary

A total of 135 completed questionnaires were received from the participants. The ranking for the assessed parameters was done on a Linkert scale of 1 to 5; where 5=Excellent; 4= Very good; 3= Good; 2= Fair; and 1= Poor. The results are summarized in Table 1.

### *Quality of research papers presented*

A big majority of the respondents (70.4%) felt that the quality of the research work presented was either very good or excellent while 24% indicated that the quality of research work was good. Cumulatively, 95% of the respondents indicated that the quality of research work presented was good or better.

### *Organization of the presentation sessions and panel discussions*

A majority of the participants (76%) indicated that the organization was either very good or excellent with about 17% indicating that it was good. Generally, therefore, 93% of the respondents felt that the organization of the presentations and panel discussions was good.

### *Extent to which the conference provided participants with new knowledge and ideas*

The extent to which participants gained new knowledge and ideas from the conference was ranked as excellent by 43% and very good by 37% of the respondents. A further 14% ranked the conference as good on this parameter. Cumulatively, therefore, 94% of the respondents felt that they gained new knowledge and ideas from the conference.

### *Conference venue*

Majority of the respondents felt that the venue of the conference was either excellent (70%) or very good (21%).

### *Conference materials provided*

The materials provided to the participants were rated excellent by 57% of the respondents while 22% felt that the materials provided were very good. Cumulatively, 93% of the respondents felt that the materials provided were at least good.

### *General arrangement of the conference*

On this key parameter, 44% of the respondents indicated that the general arrangement was excellent with a further 36% rating it as very good. Cumulatively, 93% rated the general arrangement of the conference as good or better.

### *Hospitality of the conference organizers in general*

57% of the respondents indicated to have had excellent hospitality from the conference organizers with an extra 33% rating the hospitality as very good. Cumulatively, 98% of the respondents rated the hospitality of the conference organizers as good or better.

## CONFERENCE ORGANIZNG COMMITTEE RETREAT



*PICTURE: Mount Kenya University Annual International Research and Innovation Conference Organizing Committee take a group photo with the Vice-Chancellor Prof. Stanley Waudo during a Post Conference Analysis Retreat at Blue Post Hotel on Friday 6<sup>th</sup> September 2013.*

## GRANTS

### MKU Lecturer wins Young Scientist Award



MKU lecturer Raphael Mulaha has won an International Foundation for Science (IFS) research grant worth \$11,800. Mr. Mulaha a lecturer in the department of Humanities in School of Social Sciences to carry out a project entitled “**Finger millet (*Eleusinecoracana*) yield Estimation: Integrating Remote Sensing and Indigenous Knowledge in Western Kenya**”.

### 2013 VICE-CHANCELLOR’S RESEARCH AND INNOVATION GRANT RECIPIENTS

In the year 2013, 29 members of staff from MKU were awarded Research or Innovation grant of Ksh. 100,000.

	NAME	TITLE OF THE PROJECT
1)	Mr. John Kamau	An Empirical investigation into the effect of users training on adoption of desktop open sources software by university students in Kenya
2)	Dr. Karonjo and Ms. Nancy Maingi	Factors determining uptake of long acting family planning methods among women of reproductive age in Thika District, Kenya
3)	Prof. Suleiman Mbaruk	Passive and active epidemiological studies within Kiambu County
4)	Esther Muitta	Microbial occupational and lifestyle determinants of cervical cancer among women in Nakuru County
5)	Ms. Agnes Kalenywa	Effects of mastery learning on students’ academic achievement and motivation in secondary school chemistry performance in Nairobi County Kenya
6)	Ms. Irene Khavere and Maryanne Mureithi	Knowledge attitude and practice of family planning among the women of reproductive age group (15-49) living in the streets in Nakuru town.
7)	Ruth Nyambura	Adornment among the Samburu: A Historical Perspective

8)	Mr. Peter Wanjala	Open information communication technology infrastructure sharing framework. The case of mobile service providers in Kenya
9)	Samuel Mungai, Dr. Jane Karonjo	Knowledge attitude and practices in reproductive health among the youth in Mount Kenya University, Thika Campus
10)	Catherine Kiarie	Factors hindering adoption of telecommunicating in Kenya: A case of Agricultural Research Institutes in Kiambu and Muranga County
11)	Benson Njoroge Wanjiru	Relationship between English language proficiency and mathematics performance among the secondary school students in Kahuro District, Muranga County
12)	Elena Mwai	Factors affecting adoption of ICT by small and medium enterprises in accessing information in the hospitality industry in Kenya.
13)	Mr. Alex Kiragu	Bio gated safebox
14)	Ronald Tombe	Micro blogging for back channel in strengthening asynchronous learning in formal learning
15)	Jared Misonge Onyantha	Evaluation of anti tumor activity of selected Kenyan medicinal plants used ethnomedically to manage cancer in Mount Kenya region
16)	Mr. Njagi Kevin Murithi	Sustainable e-waste management in Kenya- Role of Kenyan Universities.
17)	Gilbert Nyakundi Okebiro	The sustainability of free primary education in the educational system and its implication in Turkana society
18)	Mr. Kennedy Waweru Njeri	Sustainable e-waste management in Kenya- role of Kenyan Universities
19)	Dr. Peter Gachangaga	A study to determine the minimum lethal dose pathogenesis and pathology from indomethacin when used as a rat poison
20)	Ms. Veronica Mutua Mbenena Musau	Evaluation of financial management practices and skills needed and their impact on the principals administrative performance in public primary teacher training colleges in Kenya
21)	Ms. Catherine Kiarie	Factors affecting adoption and utilization of ICT by small and medium enterprises in accessing information in the hospital industry in Kenya.
22)	Anne Wanjiru Muiru	Relationship between psychological aspects and their impact on suicide attempts among the public and secondary school students in Murang'a County, Kenya
23)	Dr. Pamela Ochieng	Impact analysis on gender mainstreaming in higher education in Kenya
24)	Dr. Peter Kirira and Dr.	Syntheses and antimalarial evaluation of quinoline-trioxane

	Francis Muregi	and quinoline-chemosensitizer hybrid drugs
25)	Mr. Kennedy Muna Kuria	Molecular epidemiology of Human respiratory syneytial virus in Kamukunji District Kenya
26)	Annie N. Kamunge	Development of Nutrient Supplement Comprising Algae and Aloe
27)	Christina Njuguna	Gender influence on the seeking of counseling help among students in public secondary schools in Kiambu County
28)	Mr. John Michael Okoche	Plagiarism the cancer of education; case study of Mount Kenya University
29)	Mr. Joseph Gakuru and Mr. Mithamo Maina, Mr. Mbugua	Design of Computer Numerical Controller (CNC)

#### NACOSTI POSTDOCTORATE GRANTEE CONSULTATIVE MEETING



*MKU Lecturers Dr. Adiwuor (back 2<sup>nd</sup> left) and Dr. Kirira (Front 4<sup>th</sup> from the left) take a group photo with other NACOSTI postdoctoral grantees after attending a one day meeting hosted by NACOSTI CEO/Secretary Prof. Shaukat (front in the middle) at the Utalii Hotel, Nairobi.*

**Peter: Write about Prof. Nderitu's grant renewal etc**

## NAKURU CONFERENCE

Peter: Koigi Wamwere

Launch of the journal

## INTERNATIONAL CONFERENCE AND WORKSHOP ATTENDED

MKU Don attends Three weeks conference and training on indigenous people's health organized by University of Antioquia, Colombia



*PICTURE: Dr. Jesse Gitaka (4<sup>th</sup> right) from Mount Kenya University Department of Clinical Medicine with other participants at at the University of Antioquia, Medellin, Colombia to participate in the epidemiology and biostatistics course organized by the department of public health of University of Antioquia, Medellin, attend a scientific writing course, a conference on indigenous health and do field work in the remote villages at Maicao*



*PICTURE: Dr. Julius Bichanga of MKU, School of Postgraduate Studies is awarded a trophy for best paper presented for his presentation on 'Assessment of Internal Auditors' Compliance with Quality Assurance Standards: A case of State Owned Corporations in Nairobi' during The 12<sup>th</sup> International Conference on Global Contemporary Issues, Innovations & Future Challenges in Business, IT & Management in Jaipur, India held on 5<sup>th</sup> - 6<sup>th</sup> January 2013*



*Group photo: Raphael Mulaha (2<sup>nd</sup> right) and other participants in the SLU/UNA workshop at the National Agrarian University, Managua-Nicaragua held on 25<sup>th</sup> February to 5<sup>th</sup> March, 2013. The conference gave opportunities for the participating researchers to discuss theoretical and methodological*

*issues in relation to their research projects. Practical applications were discussed in the context of a field study at Zapatera Island National Park in Lake Nicaragua.*

## **MKU Participates at the 3<sup>o</sup> International Conference on Human and Social Sciences ICHSS 2013 Rome-Italy**



**Dr. Wycliffe Amukowa**  
**From School of Education represented MKU**

3<sup>o</sup> International Conference on Human and Social Sciences ICHSS 2013 held at Sapienza University of Rome on September 20-22, 2013. The ICHSS 2013 conference addressed all studies across the social and human sciences. In the spirit of interdisciplinary interchange, there were no specific topic but the Conference involved scholars, teachers and researchers working in a broad range of areas including: Education, Anthropology, Applied Sciences, Behavioral Sciences, Cognitive [Science](#), Literature, Language, Communications, History, Economics, Environmental Sciences, Health Sciences, Humanities, Interdisciplinary Studies, Law, [Management](#), [Media](#), Politics, Public Policy, Psychology, Qualitative Methods, Quantitative Methods, Social Welfare, Sociology, Technology, Geography and other areas related to the social and human sciences. More than 40 nations were represented at the conference, from Japan to Australia, from the USA and Mexico to Europe, Africa and Asia. It gathered more than 500 professors, researchers and scholars from around the world.

Dr. Wycliffe Amukowa, from School of Education represented MKU and presented a paper: *A Dialectical Justification of Inclusion of Ignorance in the Definition of Education*. The paper entertains the notion that without their opposites, things, and by extension, human thought would not exist. Without its opposite aspect, each thing or thought loses the condition for its existence. Without life, there would be no death; without death, there would be no life. Without "above", there would be no "below" without "below", there would be no "above". Without misfortune, there would be no fortune; without fortune, there would be no misfortune. Without facility, there would be no difficulty, without difficulty, there would be no facility. Without landlords, there would be no tenants; without tenants, there would be no landlords. A definition of a thing, entity or a concept necessarily implies it's opposite. Reflected alongside this contradiction, education in which its definition bears transmission of knowledge cannot exclude ignorance, which implies

the absence of knowledge. Without ignorance, there would be no knowledge, without knowledge, there would be no ignorance. It is the object of this paper to qualify ignorance as a dimension of education, hence its inclusion in the definition of education.

### **MKU School of Education Dominates the Region in Publications**

Staff and PhD students under the School of Education Publications and Research Mentorship Unit published several articles in international refereed journals. A total of 31 articles have so far been released and indexed. The Mentorship Unit was started and is supported by Dr. Wycliffe Amukowa, who is a senior lecturer in the School. These publications have added value to MKU and has seen the university appear in reputable international indexing bodies.

### **SOME PUBLICATION BY MEMBERS OF STAFF IN 2013**

#### **SCHOOL OF EDUCATION**

Njagi Karue, Amukowa Wycliffe (2013). Analysis of Factors that Lead to Poor Performance in Kenya Certificate of Secondary Examination In Embu District in Kenya. *The International Journal of Social Sciences*. 30<sup>th</sup> July 2013 Vol. 13 No.1. ISSN. 23054557.

Ngunju Alice Wambui, Amukowa Wycliffe (2013). "Constraints Facing Teachers of Christian Religious Education in Using Life Approach in Secondary Schools in Nairobi East District in Kenya." *Academic Journal of Interdisciplinary Studies*. Vol. 2, No. 2, July 2013. ISSN 2281-4612 (online) ISSN 2281-3993 (print). Sapienza University of Rome, Italy

Kirimi Josephine Kagwiria, Amukowa Wycliffe (2013). "Teacher's Productivity in Promoting Quality Education in Public Primary Schools in Kenya Analysis of Factors." *Academic Journal of Interdisciplinary Studies*. Vol. 2, No. 2, July 2013. ISSN 2281-4612 (online) ISSN 2281-3993 (print). Sapienza University of Rome, Italy.

Agnes K. Kalenywa, Amukowa Wycliffe (2013). "Influencing Choice of Institution for Professional Development: A Case Study of Post- Graduate Students' Perceptions at the Catholic University of Eastern Africa in Kenya." *Academic Journal of Interdisciplinary Studies*. Vol. 2, No. 2, July 2013. ISSN 2281-4612 (online) ISSN 2281-3993 (print). Sapienza University of Rome, Italy.

Josphine Kirimi, Amukowa, Wycliffe. (2013). "Implications of Herbert Spencer's Knowledge of most worth to the Achievement of Knowledge Economy through Research and Innovations." *Beder University Journal of Educational Sciences* Volume 3, September 2013 ISSN 23060557.

Gongera George et al., (2013) "Organizational Conflict Management Strategies on employee job satisfaction: A case study of Nzoia Sugar Company International Institute for Science Technology & Education.

Amukowa, Wycliffe. (2013). "Conceptualizing Public Service Equity and Equality in Kenya: Towards Zero Unemployment." *The International Journal of Social Sciences*. Vol.3 Issue 4, ISSN: 2223-4934 E and 2227-393X Print.

Estambale, T.N. Nderitu, J. H.; Kiarie Njoroge; Kasina J. M. (2013) Factors that Influence Enrolment in Agriculture and Related Sciences in Public Universities in Kenya. *Journal of Education and Social Sciences*. Volume 2.No. 1.pp 3-15

Amukowa, Wycliffe. Atancha O. Jeremiah (2013). "Kenya's Political Regime in Need of a Humanizing Pedagogy: what to Learn from Paulo Freire's Pedagogy of the Oppressed." *American International Journal of Contemporary Research*. Vol. 3 No. 7; July 2013

Kariuki Moses, Nderitu Amukowa, Wycliffe (2013). Understanding the Morality of Teaching Profession With Reference To Immanuel Kant's Conceptualization of Good Will versus Duty. *Journal of Education and Human Development*, 2(1).

Amukowa, Wycliffe. (2013). "When Did God Create Hell?" *Academic Journal of Interdisciplinary Studies*. Vol. 2, No. 2, July 2013. ISSN 2281-4612 (online) ISSN 2281-3993 (print). Sapienza University of Rome, Italy

Amukowa, Wycliffe. Atancha O. Jeremiah (2013). The Vanishing Essence of Universities of Science and Technology in Kenya: The Role of a University in Changing the World. *Academic Journal of Interdisciplinary Studies*. Vol. 2, No. 2, July 2013. ISSN 2281-4612 (online) ISSN 2281-3993 (print). Sapienza University of Rome, Italy

Beatrice A. Nyakan (2013) Teachers' Perceptions on the Effects of HIV/AIDS Pandemic on Schooling among Primary School Pupils in Rachuonyo District, Kenya, *Journal of Education and Social Sciences*. Vol. 2, No. 1, pp 35-48

Amukowa, Wycliffe. (2013). "Against Narration Sickness in Higher Education: Implications of Paulo Freire's Banking Concept of Education on Achievement of University Education Objectives in Kenya in the light of the Universities Act 2012." *Journal of Educational and Social Research*. Vol. 3 (2) May 2013. ISSN 2239-978X. University of Rome, Italy

Bernard Gechiko Nyabwari, Tom Nyamache, Ruth Nyambura (2013) Educating for Holistic Development in Seventh - day Adventist (SDA) Schools in Nyamira County, Kenya. *Journal of Education and Social Sciences*. Vol. 2, No. 1, pp 56-78

Amukowa, Wycliffe. Gunga, Samson.O&Ayuya, Caroline. (2013). "Can Education System be Repaired? Ideological Dearth in Kenya's Educational Practice and its Implications for Reforms in the Education Sector." *Journal of Educational and Social Research*. . Vol. 3 (2) May 2013. ISSN 2239-978X. University of Rome, Italy

Amukowa, Wycliffe & Ayuya, Caroline. (2013). "Leveraging Science, Technology and Innovation for National Development in the light of the Emerging Universities of Science and Technology in Kenya." *Mediterranean Journal of Social Sciences Vol 4 No 2 May 2013*. ISSN 2039-9340 (print) ISSN 2039-2117 (online). Sapienza University of Rome, Italy.

Amukowa, Wycliffe. (2013). "The Challenges of Anti-Corruption Initiatives: Reflections on Strategies of the Defunct Kenya's Anti-Corruption Commission." *Mediterranean Journal of Social Sciences Vol 4 No 2 May 2013*. ISSN 2039-9340 (print) ISSN 2039-2117 (online). Sapienza University of Rome, Italy.

Amukowa, Wycliffe. Atancha O. Jeremiah (2013). "The Tyranny of Numbers and Ethnic political patronage in Kenya: Lessons from the United States of America's Electoral College Vote Process." *The International Journal of Social Sciences. Vol. 9*. ISSN. 23054557.

Amukowa, Wycliffe. (2013). "The 21<sup>st</sup> Century Educated Mount Kenya University Graduate and its Implications for the Practice of Higher Education." *International Journal of Social Sciences & Education 2013 Vol. 3 Issue 3*, ISSN: 2223-4934 E and 2227-393X Print.

Amukowa, Wycliffe (2013). "A Call to Reform Secondary Schools in Kenya." *American International Journal of Contemporary Research. Vol. 3 No. 1; January 2013*.

Amukowa, Wycliffe & Ayuya, Caroline (2013). "The 21<sup>st</sup> Century Educated African Person and the Loss of Africans' Educational Identity: Towards an Afro Education Model." *Academic Journal of Interdisciplinary Studies. Vol. 2, No. 1, March 2013*. ISSN 2281-4612 (online) ISSN 2281-3993 (print). Sapienza University of Rome, Italy.

Amukowa, Wycliffe & Gunga, Samson O (2013). "The Role of Anti-Corruption Education in the Light of Aristotelian Concept of Akrasia: An Epistemic Inquiry into the Anti-corruption Initiatives in Kenya." *Mediterranean Journal of Social Sciences. Vol. 4, No. 4, March 2013*. ISSN 2039-9340 (print) ISSN 2039-2117 (online). Sapienza University of Rome, Italy.

## **SCHOOL OF SOCIAL SCIENCES**

Kebenei David Kibiwott (2013) The Place of Constituencies Development Fund (CDF) under the New Constitution in Kenya. *Journal of Education and Social Sciences*. Vol. 2 No. 1. Pp26-34

K. K. Mutundu, J. H. Nderitu, D. Mureithi, H. Wainaina, B. Ayugi (2013). Baseline survey on interventions in upgrading animal health and production in ASALS of Marsabit County, Marsabit, Kenya.; 2013.

Ruth Nyambura, Tom Nyamache, Bernard Gechiko (2013) Evil Eye: An African Overview. *Journal of Education and Social Sciences*. Vol. 2 No. 1 pp 114-121

Tom Nyamache, Lydia Kaniu, Ruth Nyambura(2013).An Investigation into the Demand for Naturopathy Services in Urban Centres in Kenya.*Journal of Education and Social Sciences*. Vol. 2 No. 1 pp 79-97

K.K. Mutundu, D. Mureithi, A. Odhiambo, D. Mureithi and John H. Nderitu (2013).Opportunity for university intervention in upgrading animal health service industry (2013).Workshop Proceedings, REGAL-AG/ACDI/VOCA, Kenya, MKU, August 2013, Marsabit, Kenya; 2013.

### **SCHOOL OF PURE AND APPLIED SCIENCES**

John Kamau, Ian Sanders (2013). Empirical investigation into the effect of usability on adoption of Desktop Open Source Software by university students in Kenya.*Computer and Information Science*, Vol. 6, No. 3.

Kega, V.M.,Nderitu, J.H., Olubayo, F., and M. Kasina, M (2013). A Logit analysis of farmer' knowledge of African white rice stem borer, *Maliarphaseparatella Rag* at Mwea irrigation scheme, Kirinyaga County, Central Province, Kenya. National Council for science and Technology."; 2013.

Muthoni J., Kabira, J.N. ,Kipkoech D.,Abong G.O. and Nderitu J.H (2013). Yield Performance of Potato Seed Tubers after Long Storage in a Diffuse Light Store (DLS). Mount Kenya University Annual Research and Inn."; 2013.

Mwombe,Mungivane, Nderitu, J. H.(2013). Evaluation of Information and Communication Technology (2013).Utilization by Small Holder Banana Farmers in Gatanga District, Kenya.Journal of Agricultural Education and Extension. 1-15."..

Bernard, O. O., Muthomi, J. W. and Nderitu, J. H. (2013).of Integrating Biological, Synthetic and Botanical Pesticides on Thrips Population and Yield of French Beans. Mount Kenya University Annual Research and Innovat."; 2013.

Daniel O. Odhiambo, John Mburu, Chris Ackello-OgutuNderitu, J. H., (2013)Competitiveness of smallholder snap bean production in KirinyagaCounty, Kenya." International Review of Business and Social Sciences . 2013;2:49-65.

Estambale, T. N., Nderitu, J. H., KiarieNjoroge, Kasina, J. M. (2013). Factors that influence enrolment in agriculture and related sciences in public universities in Kenya. Journal of Education 2(1): 3-15.

G. O. Wafula, J. W. Muthomi, J. H. Nderitu and G. N. Chemining'wa (2013).Management of snap bean pests by integrating seed dressing, foliar sprays and intercropping with maize.Hak Conference, Meru, Kenya, 3rd-6th December 2013.

Kasina, Muo; Nderitu JH. (2013) *Policy Implementation And Its Economic Impact On Potato Marketing Value Chain In Kenya.*;

Kega, V.M., J.H Nderitu, F. Olubayo and M. Kasina. (2013) Assessment of yield loss caused by *Maliarpha Separatella Rag.* on rice at Mwea, Kirinyaga County, Kenya. Mount Kenya University Annual Research and Innovation Conference."; 2013.

Kwach J.K., Onyango M. A, Muthomi J. W., Nderitu J.H., (2013). Mat Rehabilitation of Banana Xanthomonas Wilt Infected orchards in Epidemic Areas of Western Kenya. Mount Kenya University Annual Research and Innovation Confer."; 2013.

Kwach, J., K.; J. W. Muthomi; M. A. Onyango and J. H. Nderitu (2013). Status and spread of Banana Xanthomonas Wilt in Kenya. 11th ACSSC, 13th-18th October 2013, Entebbe, Uganda ."; 2013.

Kega VM;, and Kasina, M. Nderitu, JH. "Management of Maliarphaseparatella Rag Using Effective Entomopathogenic Nematodes and Resistant Rice Cultivars. Journal of Entomology, 10: 103-1." Journal of Entomology. 2013; 10: 103-109: 103-109.

Muthomi JW;, Nderitu JH;, Olubayo FM;, Kabira JN;, Chemining'wa GN;, Kiretai SM;, Aura JA;, Muindi EM. (2013) "Management Of Potato Viruses In Seed Potato Production Using Border Crops."; Abstract

Mwaniki, S.W; Nderitu JH; (2013) Mass Production Of Entomopathogenic Nematodes Using Silkworm (*Bombyx Mori L.*) For Management Of Key Agricultural Pests.; 2013.

Mugambi, I. K., Muthomi, J. W., Ojiem, J., Chemining'wa, G. N. and Nderitu, J. H. (2013). Effect of Incorporating Lablab Residues on Bean Root Rot and Chafer Grub. Mount Kenya University Annual Research and Innovation."; 2013.

Nderitu, J. H., Wahome, R. Okemo, P. (2013). Current Status and proposed postgraduate training model for East Africa Universities. Mount Kenya University Annual Research and Innovation Conference, Nairobi, 28th-30th August.";.

Nderitu, John H. and Arshfod Njenga (2013). Implementation of Value Chain Development Training Curricula at Selected Universities in Kenya ( January 2013). PSDA/GIZ, Nairobi, Kenya.; 2013.

Ochilo, W., Nyamasyo, G. & Nderitu, J.H (2013). Impact of Soil Fertility Management Practices on a Major Insect Pest and Yield of Beans (*Phaseolus vulgaris L.*) in Taita District, Kenya. African Journal of Food, Nutrition and Development, 13(5): 8340-83.

## **SCHOOL OF HEALTH SCIENCES**

Karau, G.M., E.N.M. Njagi, A.K. Machochi, L.N. Wangai and P.N. Kamau.

Hypoglycemic Activity of Aqueous and Ethylacetate Leaf and Stem Bark Extracts of *Papeacapensis* in Alloxan-induced Diabetic BALB/c Mice

Karau, Geoffrey Muriira, Eliud Nyagah Mwaniki Njagi, Alex King'ori Machocho, Laura Nyawira Wangai, Peter Ng'aru Kamau. Phytochemicals, Minerals and *In vitro* Antioxidant Capacity of Leaf and Stem Bark Powders of *Sennaspectabilis*. *Journal of Pharmacognosy and Phytochemistry*. Volume 2, Issue 2, (2013) issue.

## WORKSHOPS AND TRAININGS

During the year 2013, a total of xxx workshops were organized covering different areas including; biosafety training, research training, .... In total, xxx members of staff were trained. This is roughly xx% of the total number of full time staff. (Peter, please provide this summary)

Below is a summary on

### Training on bioethics in Research

NAME	TRAINING	DATE
Mr. Bernard Mbithi	Bioethics training, SACDEP, Thika	15/04/2013
Ms. Nancy Maingi	Bioethics training, SACDEP, Thika	15/04/2013
Damaris Kamau	Bioethics training, SACDEP, Thika	15/04/2013
Mr. Francis Muregi	Bioethics training, SACDEP, Thika	15/04/2013
Ms. Beatrice Amugure	Bioethics training, SACDEP, Thika	15/04/2013
Dr. Edith Wakori	Bioethics training, SACDEP, Thika	15/04/2013
Mr. Kennedy Muna	Bioethics training, SACDEP, Thika	15/04/2013
Prof. Mbaruk Suleiman	Bioethics training, SACDEP, Thika	15/04/2013
Dr. Christine Wangia	Bioethics training, SACDEP, Thika	15/04/2013
Ms. Zipporah Ndungu	Bioethics training, SACDEP, Thika	15/04/2013
Mr. Samuel Mungai	Bioethics training, SACDEP, Thika	15/04/2013
Dr. Olivia Lwande	Bioethics training, SACDEP, Thika	15/04/2013
Mr. Jackson Mulwa	Bioethics training, SACDEP, Thika	15/04/2013
Ms. Esther Mandania	Bioethics training, SACDEP, Thika	15/04/2013
Ms. Everlyne Ogugu	Bioethics training, SACDEP, Thika	15/04/2013
Ms. Purity Gacheri	Bioethics training, SACDEP, Thika	15/04/2013
Mr. Paul Kimani	Bioethics training, SACDEP, Thika	15/04/2013
Ms. Esther Muitta	Bioethics training, SACDEP, Thika	15/04/2013
Mr. Peter Mwaura	Bioethics training, SACDEP, Thika	15/04/2013
Dr. Jesse Gitaka	Bioethics training, SACDEP, Thika	15/04/2013
Mr. Humphrey Muyebele	Bioethics training, SACDEP, Thika	15/04/2013
Mr. Simon Langat	Bioethics training, SACDEP, Thika	15/04/2013

### 2.7.3 Professionalism and ethics in research training

NAME	TRAINING	DATE
Dr. James Muthomi	Research Ethics, SACDEP, Thika	03/05/2013
Dr. Maina Wagacha	Research Ethics, SACDEP, Thika	03/05/2013
Prof. John H. Nderitu	Research Ethics, SACDEP, Thika	03/05/2013
Mr. Barack Ouma	Research Ethics, SACDEP, Thika	03/05/2013
Dr. Awori Martin	Research Ethics, SACDEP, Thika	03/05/2013
Dr. Muhoro Michael	Research Ethics, SACDEP, Thika	03/05/2013
Mr. Samuel Mungai	Research Ethics, SACDEP, Thika	03/05/2013
Ms. Nancy Maingi	Research Ethics, SACDEP, Thika	03/05/2013
Mr. David Kihara	Research Ethics, SACDEP, Thika	03/05/2013
Ms. Jane Njuguna	Research Ethics, SACDEP, Thika	03/05/2013
Mr. James Wakahiu	Research Ethics, SACDEP, Thika	03/05/2013
Ms. Susan Mururi	Research Ethics, SACDEP, Thika	03/05/2013
Mr. Ayuo Timothy	Research Ethics, SACDEP, Thika	03/05/2013
Ms. Gladys Maina	Research Ethics, SACDEP, Thika	03/05/2013
Ms. Rachel Maina	Research Ethics, SACDEP, Thika	03/05/2013
Mr. Peter Ng'aru	Research Ethics, SACDEP, Thika	03/05/2013
Mr. Wamalwa Martin	Research Ethics, SACDEP, Thika	03/05/2013
Ms. Ann Kariuki	Research Ethics, SACDEP, Thika	03/05/2013
Ms. Judy Mwangi	Research Ethics, SACDEP, Thika	03/05/2013
Ms. Tabitha Kariuki	Research Ethics, SACDEP, Thika	03/05/2013
Dr. Christine Wangia	Research Ethics, SACDEP, Thika	03/05/2013
Dr. K.K Mutundu	Research Ethics, SACDEP, Thika	03/05/2013
Dr. D.K Mureithi	Research Ethics, SACDEP, Thika	03/05/2013
Mr. Samuel Mathenge	Research Ethics, SACDEP, Thika	03/05/2013
Dr. SamwelOdiwuor	Research Ethics, SACDEP, Thika	03/05/2013
Ms. Rosemary Mwangi	Research Ethics, SACDEP, Thika	03/05/2013
Ms. MonicahWanjiku	Research Ethics, SACDEP, Thika	03/05/2013
Ms. Terry Kiragu	Research Ethics, SACDEP, Thika	03/05/2013

### 2.7.4 Biosafety training

NAME	TRAINING	DATE
Dr. SamwelOdiwuor	Biosafety Training, SACDEP, Thika	09/05/2013
Dr. Francis Muregi	Biosafety Training, SACDEP, Thika	09/05/2013
Mr. Michael Kamau	Biosafety Training, SACDEP, Thika	09/05/2013
Ms. Joyce Waititu	Biosafety Training, SACDEP, Thika	09/05/2013
Ms. Lucy Kamau	Biosafety Training, SACDEP, Thika	09/05/2013
Ms. Grace Manyu	Biosafety Training, SACDEP, Thika	09/05/2013
Ms. Miriti Susan	Biosafety Training, SACDEP, Thika	09/05/2013

Mr. Peter Kamau	Biosafety training, SACDEP, Thika	09/05/2013
Dr. Christine Wangia	Biosafety Training, SACDEP, Thika	09/05/2013
Dr. Peter Kirira	Biosafety Training, SACDEP, Thika	09/05/2013
Mr. Paul Kimani	Biosafety Training, SACDEP, Thika	09/05/2013
Ms. Purity gacheri	Biosafety Training, SACDEP, Thika	09/05/2013
Mr. EliudNg'ang'a	Biosafety Training, SACDEP, Thika	09/05/2013
Dr. Dominic Mureithi	Biosafety Training, SACDEP, Thika	09/05/2013
Mr. SamwelMungai	Biosafety Training, SACDEP, Thika	09/05/2013

### 2.7.5 Innovators Platform Workshop

NAME	TRAINING	DATE
Mr. Alex Kiragu	Innovation platform, MKU, Thika	18/06/2013
Dr. Peter Kirira	Innovation platform, MKU, Thika	18/06/2013
Mr. Richard Ondieki	Innovation platform, MKU, Thika	18/06/2013
Mr. MuchiriGachiri	Innovation platform, MKU, Thika	18/06/2013
Mr. Bevin Kundu	Innovation platform, MKU, Thika	18/06/2013
Mr. Wallace Kariuki	Innovation platform, MKU, Thika	18/06/2013
Mr. Hillary Maiyo	Innovation platform, MKU, Thika	18/06/2013
Mr. Peter Muthondeki	Innovation platform, MKU, Thika	18/06/2013
Mr. Robinson Waitthaka	Innovation platform, MKU, Thika	18/06/2013
Mr. Daniel Thairu	Innovation platform, MKU, Thika	18/06/2013
Mr. Michael Odotte	Innovation platform, MKU, Thika	18/06/2013

### 2.7.6 Research Coordinators Workshop

NAME	WORKSHOP	DATE
Alex Kiragu	Research Coordinators workshop, Cravers, Thika	25/10/2013
Dr. OyooWecke	Research Coordinators workshop, Cravers, Thika	25/10/2013
Dr. Samuel Odiwuor	Research Coordinators workshop, Cravers, Thika	25/10/2013
Dr. Nancy Cheseto	Research Coordinators workshop, Cravers, Thika	25/10/2013
Dr. Samuel Karenga	Research Coordinators workshop, Cravers, Thika	25/10/2013
Mr. Opana Stephen	Research Coordinators workshop, Cravers, Thika	25/10/2013
Dr. Daniel Kandagor	Research Coordinators workshop, Cravers, Thika	25/10/2013
Mr. Paul Kiilu	Research Coordinators workshop, Cravers, Thika	25/10/2013
Prof. John Nderitu	Research Coordinators workshop, Cravers, Thika	25/10/2013
Dr. Peter Kirira	Research Coordinators workshop, Cravers, Thika	25/10/2013
Ms. Joyce Njuguna	Research Coordinators workshop, Cravers, Thika	25/10/2013

Ms. Agnes Kalenywa Research Coordinators workshop, Cravers, Thika 25/10/2013  
Dr. Martin Awori Research Coordinators workshop, Cravers, Thika 25/10/2013  
Mr. Wamalwa Martin Research Coordinators workshop, Cravers, Thika 25/10/2013  
Ms. Esther Ndung'u Research Coordinators workshop, Cravers, Thika 25/10/2013  
Ms. Ruth Njuguna Research Coordinators workshop, Cravers, Thika 25/10/2013  
Mr. Fredrick Mulei Research Coordinators workshop, Cravers, Thika 25/10/2013  
Dr. Francis Muregi Research Coordinators workshop, Cravers, Thika 25/10/2013  
Ms. Esther Ndung'u Research Coordinators workshop, Cravers, Thika 25/10/2013  
Mr. Jared Mosoti Research Coordinators workshop, Cravers, Thika 25/10/2013  
Mr. Wenslausmakhatsa Research Coordinators workshop, Cravers, Thika 25/10/2013  
Dr. Simon Nderitu Research Coordinators workshop, Cravers, Thika 25/10/2013  
Mr. Peter Ng'aru Research Coordinators workshop, Cravers, Thika 25/10/2013  
Ms. Esther Mandania Research Coordinators workshop, Cravers, Thika 25/10/2013  
Ms. Damaris Kamau Research Coordinators workshop, Cravers, Thika 25/10/2013  
Ms. Leah Mugoh Research Coordinators workshop, Cravers, Thika 25/10/2013  
Mr. John Kamau Research Coordinators workshop, Cravers, Thika 25/10/2013  
Dr. Wamboi C Research Coordinators workshop, Cravers, Thika 25/10/2013  
Ms. Jane Muthoni Research Coordinators workshop, Cravers, Thika 25/10/2013  
Mr. Samuel Mungai Research Coordinators workshop, Cravers, Thika 25/10/2013  
Dr. Jane Karonjo Research Coordinators workshop, Cravers, Thika 25/10/2013

Photo intellectual property training workshop



The topic on the “THE MISSING-LINK IN RESEARCH AND INNOVATION CYCLE” was presented by Dr Benson Kinyagia of National Commission for Science and

Innovation (NCSTI) and the highlight was “The Valley of Death occurs only in the presence of ‘non-economic’ investments (such as government expenditures on basic research) that are made in very early stage research without sufficient attention to the likely investment decisions at later stages of the innovation process”.

Prof. Evans Baiya of Evasstrategic Innovation Brewery from Idaho USA presented on “Role of Innovation in Products Development” with highlight on products development cycle.

Role of Patenting in Innovation and Product development and Marketing and Opportunities of Research and products development in expired patents. The highlights were on the presence of unique and the most complete collection of technological information and data on what is going on in the different fields of technology in the patenting process. Studying the patent documents, everybody working on the development of new products, or in R&D in specific fields of technology, can know what developments are taking place in any company or firm in the world and one can also identify the state of the art of the research in specific technological fields and learn about the progress of the competitors, what are their most recent inventions and where protection for such inventions is being sought.

Engineer David Mulongo Managing Director-Viscar Industrial Capacities presented on the Role of mentors and Industrial Associates in the Incubation Process. The focus was on how mentors show direction through guidance and sharing real life experience the industry provides resources and environment for students to learn, develop and grow.

Dr. Francis K. Njonge of JKUAT did a presentation on Innovation and Enterprise with focus on Innovation Importance, requirements, process, s-curve of innovation and Innovation pathway. He emphasized on the role Stanford University played in the Silicon Valley and the Technology revolution associated with Silicon Valley’s Universities and their program. With examples of HP, Google, Yahoo, You tube, Adobe and Apple.

Mr. Adams Wako of KIRDI gave a presentation on Product and Business Incubation. The Presenter focused on the challenges that are faced by start-ups business, roles of Industrial mentors and the services provided by Incubators to address the gap. He also presented on how KIRDI Product and Business Incubation Process operates.

PROF. M. PETER WANDERI-Director, University-Industry Partnerships, Kenyatta University presented on Management of Incubation Centre with Special Reference to Chandaria Business Innovation and Incubation Centre. The presenter focused on the

two Levels of Mentoring at Chandaria BIIC namely Professional (Internal) Mentoring and the Distinguished (External) Mentoring programs by partners. He also emphasized on the management hallmarks at Chandaria BIIC namely Numerous internal evaluations by all parties, Exhibitions, locally and international and Management by a Board with partners' representation.

The Vegetable Value Chain is supported by Kenya Agricultural Productivity and Agribusiness Project (KAPAP). This workshop was intended to share project findings from the first year's activities, with stakeholders, and map out activities for the second year. The meeting had been called to present research findings of the different vegetables in the project. The programme was organized in form of presentations, which were accompanied by discussions emanating from the presentations.

Photo to be provided by Peter

## **JOURNAL PUBLICATION**

Mount Kenya University, Kitale Campus launched its inaugural issue of *The International Journal of Agribusiness, Innovations and Rural Development (IJAIRD)* 22<sup>nd</sup> November, 2013.



Photo:

In a keynote address, during the inaugural issue of the International Journal of Agribusiness, Innovation and Rural Development (IJAIRD) Prof. Stanley Waudo

discusses the need for agricultural revolution, pointing to the fact that national food production cannot keep pace with the growing population if the pillars to agricultural revolution cannot be exploited. He extensively explores organic farming, green evolution and bio-technology as areas that need to be considered in an attempt to revolutionize agriculture in Kenya.

Mount Kenya University, Kitale Campus launched its inaugural issue of *The International Journal of Agribusiness, Innovations and Rural Development (IJAIRD)* 22<sup>nd</sup> November, 2013. The event was officiated by The Vice Chancellor of Mount Kenya University Prof. Stanley Waudu, and graced by a number of dignitaries including the Deputy Governors of Trans Nzoia, and Nandi County, Minister of Education Trans Nzoia County, Minister of Gender, Sports and Youth Affairs- Trans Nzoia County, among others.

This inaugural issue of the *International Journal of Agribusiness, Innovation and Rural Development (IJAIRD)* contains a total of ten papers selected from a range of articles presented at the conference.

In a keynote address, **Prof. Stanley Waudu** discussed the need for agricultural revolution, pointing to the fact that national food production cannot keep pace with the growing population if the pillars to agricultural revolution cannot be exploited. He extensively explores organic farming, green evolution and bio-technology as areas that need to be considered in an attempt to revolutionize agriculture in Kenya.

Collectively, the papers published in this issue suggest the need for a broader perspective to the challenges of enhancing agricultural production, achieving food security, and improving livelihoods and stimulating socio-economic development in rural areas. Going forward, IJAIRD will continue to engage with these and related issues by publishing theoretical reflections, critical analyses, and empirical findings.

## STUDENT ACHIEVERS



Esther Monchari (L) and Dorcas Adhiambo Owino (R) MKU students of Diploma in Business Information Technology are among 18 teams that were chosen out of 1400 applicants in a program sponsored by Safaricom's The Next Big Idea in conjunction with Invested Development and ilab Africa. Dorcas is working on a 3rd party 3d game called Linda Pori.

Dorcas is very passionate about technology and is learning android and windows phones to help convert ideas into products. On the other hand Esther and her team (called team Waltron) have developed a mobile application called EEMS (Efficient Electricity Management System). During the incubation they were trained on developing applications but also making a business from the applications.



Mount Kenya university School of Health Science student Ms. Abigael Ndida celebrates her awards after winning The 1ST nominees Of the WANGARI MAATHAI FUND SCHOLARSHIP held at the Green Belt movement offices. The WangariMaathai Scholarship Fund is an environmental innovations fund that seeks to encourage and promote sustainable development through the spirit of environmentalism as championed by the late Prof. Maathai. The annual award gives a maximum of USD10,000 (ksh 800,000).

## COMMUNITY SERVICE

### SNAPBEAN FARMERS FIELD SCHOOL IN EMBU AND MWEA DIVISION



Mount Kenya University led by Prof. John H. Nderitu and the University of Nairobi led by Dr. George Chemining'wa in collaboration with the County departments of Agriculture Mwea East sub-County and Embu East sub-County organized a Snap bean Farmer's Field School at project sites funded by ASARECA on 21<sup>st</sup> and 28<sup>th</sup> August, 2013 in Mwea and Embu respectively. Over 80 participants comprising of groups of farmers, industry stakeholders and government institutions attended the field days in their respective areas.

Library staff at Joytown Secondary school for Persons with disabilities. Librarian (Victoria Munyao ) in white dust coat front left, and library staff assist students to cover books.

Peter include Kwanza Farm Kitale, KEFRI trainings

## INNOVATIONS

### 1. Thermo-Derived Power Generator

Kiragu an Innovation Technologist at Mount Kenya University has designed and constructed a thermo electronic system (Thermo Derived Power Supplier), capable of converting thermal energy into electrical energy directly without using a thermodynamic system. "The systems are capable of converting intentionally and unintentionally wasted heat from combustion systems such as incinerators, boilers, LPG burners, biomass and petroleum driven systems and controlling them electronically," says Kiragu adding that the system can light about five bulbs and can charge phones. Alex Kiragu's two innovations, A Foot operated Handwash Unit and Thermo Derived Power Supplier, have received accolade from the National Council of Science and Technology (NCST) attracting Ksh480,000 (US\$5,486 ) and Ksh550,000 (US\$6,286 ) in grants respectively.



Photo: Alex Kiragu

demonstrating how a thermo-derived Power Supplier works

The foot operated handwash system has a hygienic valve that can be connected to an existing water system. He has so far sold two units as a pilot phase at Ksh16, 000 (US\$183).

## 2. Converting E-Waste To Resources



Mr. Peter Mithamo an engineering technologist converts waste electronics fridges and microwaves among other e-wastes to fully functional solar powered egg incubators. Currently Mr. Mithamo is working on a commercial 5000 eggs solar powered incubator.



**Jennifer Catalano**

**Director, Youth Economic Participation Initiative**



Jennifer Catalano is the Director of the Youth Economic Participation Initiative at the Talloires Network. Jennifer holds a Masters degree in International Affairs from the Fletcher School of Law and Diplomacy, where she studied Human Security and Monitoring and Evaluation. Prior to graduate school, Jennifer held program director and project management positions in the international NGO and private sectors. Jennifer is currently based in Boston. She has lived and worked in Europe, Central America, Africa, and South Asia. Her interests include gender and youth in development, innovative approaches to monitoring and evaluation, the anthropology of development, crisis mapping, and the ethics of aid.



## LINKAGES

### 1. University of Cincinnati



Dr. Adrian Parr from University of Cincinnati is developing a collaborative study abroad and service-learning program aimed at improving the lives of children living in the Nairobi slum of Riruta, Dagoretti South. UC faculty and students would work together with faculty and students from Mount Kenya University and Mainstream Sports Academy to develop a sustainable child friendly water and sanitation facility for the children of Mainstream Sports Academy. The facility would be free for the children. Members from the general community would need to pay a small fee to use the facility.

**Include photo of the Chairman and Dr. Ramani tour to Cincinnati and Xavier University.**

## 2. Xaxier University

### MKU AND XAVIER UNIVERSITY,US SIGNS MEMORANDUM OF ASSOCIATION TO STRENGTHEN MEDICAL TRAINING



MKU and XU have signed an International Collaboration Agreement, to formalize future partnering in:

- Joint research and training programs;
- Faculty and student exchange;
- The preparation of joint proposals for external funding;
- Joint programs of consulting and evaluation;
- Joint sponsorship of conferences;
- Joint publication;
- Exchange of materials, articles and other publications; and/ or
- Other such activities as may be mutually agreed upon.

### 3. SAP University Alliance

## Mount Kenya University

Mount Kenya University is proud to be a member of the SAP University Alliances program. According to SAP, this program is a global endeavor to provide university faculty with the tools and resources necessary to teach students how technology can enable integrated business processes and strategic thinking, giving students the skills to add immediate value to the employment marketplace.

SAP University Alliances member schools have access to SAP Enterprise Resource Planning (ERP) software, the dominant ERP software for Fortune 500 companies. The



availability of this software enables students to

- Put theory into practice
- Understand and appreciate the potential for an enterprise-wide information system to increase effectiveness and efficiency
- Learn how technology can empower a business to optimize accounting and controlling, HR, project planning, plant and materials management, sales and distribution

Programs such as this underscore Mount Kenya University's commitment to hands-on learning.

### 4. MKU-KEFRI Partnership

MKU-KEFRI PARTNER ON TREE FARMERS TRAINING



*MKU Vice-Chancellor (right) exchange copies of the MoU with Gordon Sigu, Principal Research Scientist, KEFRI*

**Include photos taken during awarding of certificates**



The training was precluded by various deliberations on a working relationship between Kenya Forestry Research Institute (KEFRI) and Mount Kenya University (MKU) which resulted in the preparation of the agreement and budget that were eventually signed to enable the commencement of the training program.

This was followed by a curriculum review seminar to customize a curriculum prepared by experts from MKU to suit the farmers' specific areas of plant and plant products. This curriculum is divided into two phases. Phase one involved, in house training at MKU where the trainees were inducted in the areas of business and entrepreneurship, Contract negotiation, Value chain, Managing accounts and Book keeping, Microfinance, Business Planning, and Market assessment for 10 days, followed by a seminar on proposal writing, project report writing, Intellectual Property rights and research and development. The second phase involved the writing of a business plan and a project report with the supervision of MKU facilitators, day visits to follow up on the students implementation of the materials learned during the first phase as well as supervision at areas attached to practice the same.

The in house training started on 10<sup>th</sup> of June 2013 with the opening ceremony, followed by intense sessions as per the curriculum course outlines which involved a lot of practical work. This culminated in the practical testing of the students' appreciation of the trained areas where

they were allowed to sell their wares as they were evaluated by the facilitators. The 20 trainees in the program were very enthusiastic and cooperative and I cannot remember having facilitated a class like theirs.

Monitoring and evaluation was done for every training session. This involved the facilitators evaluating the trainees as well as the trainees evaluating the facilitators. These were reviewed on a daily basis for continual improvement. Also an initial poverty index questionnaire was filled by every trainee to determine their poverty index. This was also done later on with the same trainees to determine the impact of the training.

## FARMERS TRAINED

## FARMERS FIELD SCHOOL KITALE




***PICTURE: From Left MKU Deputy Vice-Chancellor, Campuses and Constituent Colleges, Prof. Evans Kerosi, Pro-Chancellor, Prof. Chacha Nyaigotti Chacha, Vice-Chancellor, Prof. Stanley Waudu and Deputy Vice-Chancellor, Research and Development admire a demonstration farm during the Kitale Annual Field Day.***

**PHOTO: MKU Vice-Chancellor, Prof. Stanley Waudu, officially Launches**

**MKU ETHICAL RESEARCH COMMITTEE ACCREDITED BY NCST**

MKU INSTITUTION ETHICS COMMITTEE ACCREDITED BY THE NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION.

NCST/HSS/AC-22

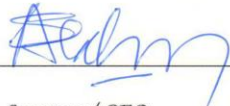


REPUBLIC OF KENYA  
**NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY**


**Institutional Ethics Review Committee  
Certificate Of Accreditation**

This is to certify that the MT. KENYA UNIVERSITY

Institutional Ethics Review Committee, registration number; 01513 having been duly assessed by the National Bioethics Committee, is hereby accredited to operate and conduct ethics review of research proposals in HEALTH SCIENCES for a period of three years with effect from 7th JUNE, 2013 to 6th JUNE, 2016

Signed:   
Secretary/CEO

Date: 8<sup>th</sup> July 2013





*Research and Development Division led by the Director, Research and Development Dr. Francis Muregi Pose for a group Photo during a Postgraduate Research Methodology training Held at Nuru Palace Hotel.*

**Peter:** Include training topics, and the list of trainees.

#### **PICTURE 1**

Senior Nairobi university lecturer Dr Maina Wagacha (left) presents a certificate of participation to MKU lecturer Nancy Maingi. Twenty MKU lecturers attended a five day seminar at SACDEP in Thika on training course in professionalism and ethics in research. The seminar was sponsored by MKU and facilitated by Dr Wagacha and his colleague Dr James Muthomi. Looking on is MKU deputy vice chancellor in charge of research and development Prof John Hurianderitu.

#### **PICTURE 2**

Dr James Muthomi presenting a certificate to Dr Michael Muhoro of MKU Nakuru campus. Nderitu looks on.

Pupils from Salvation Army Joytown Primary school for the physically handicapped, in Thika, Kiambu County entertain guests during the launching of their school five year strategic plan which was developed by Mt. Kenya University. The plan was launched by MKU Deputy Vice Chancellor in charge of research and development Prof. John Hurianderitu. Nderitu said the University would help in some of the projects.

## CONSULTANCY

### 1. MKU-ACDI-VOCA

#### USAID-MKU HOLDS STAKEHOLDERS' CONSULTATIVE WORKSHOP: OPPORTUNITY FOR UNIVERSITY INTERVENTION IN UPGRADING ANIMAL HEALTH SERVICE INDUSTRY



*Mount Kenya University conducted a two day workshop on 14<sup>th</sup> and 15<sup>th</sup> August 2013. The workshop was to identify opportunities and develop strategies towards increased productivity through capacity building in animal health services in ASALs area of Marsabit and Isiolo, Kenya.*

Instrumental to accelerating economic growth through livestock value chain is the upgrading of inputs markets. High quality market and market based solutions are key drivers to accelerating economic growth. Key to input markets and producer-market linkages is animal health services. In the ASAL context, the skilled human resource to provide the desired animal health service has been non-existent and hence the mushrooming of the training of Animal Health Workers(CAHWs) whose work in disease prevention, surveillance and treatment is invaluable. However, theGoK, recently passed a bill reaffirming that government does not recognize CAHWs and that they cannot operate unless they are under the supervision of district veterinary

officer. In reality, there are small number of professionally trained CAHWs and a small number of Veterinary Officers to expand their outreach to pastoral communities.

To exploit the above opportunities, a baseline survey was undertaken through the partnership and consultative project between Mount Kenya University and Resilience and Economic growth in the Arid Lands-Accelerated Growth (REGAL-AG) to devise a strategy that targets improving animal health as an input market that would enable pastoralist access to high quality services and inputs through animal health services providers outreach programs, upgrading the services providers and establishing both horizontal and vertical relationships. Therefore, the main objective of carrying out this study was to collect baseline information on opportunities and for interventions in upgrading animal health services and production in Marsabit County.

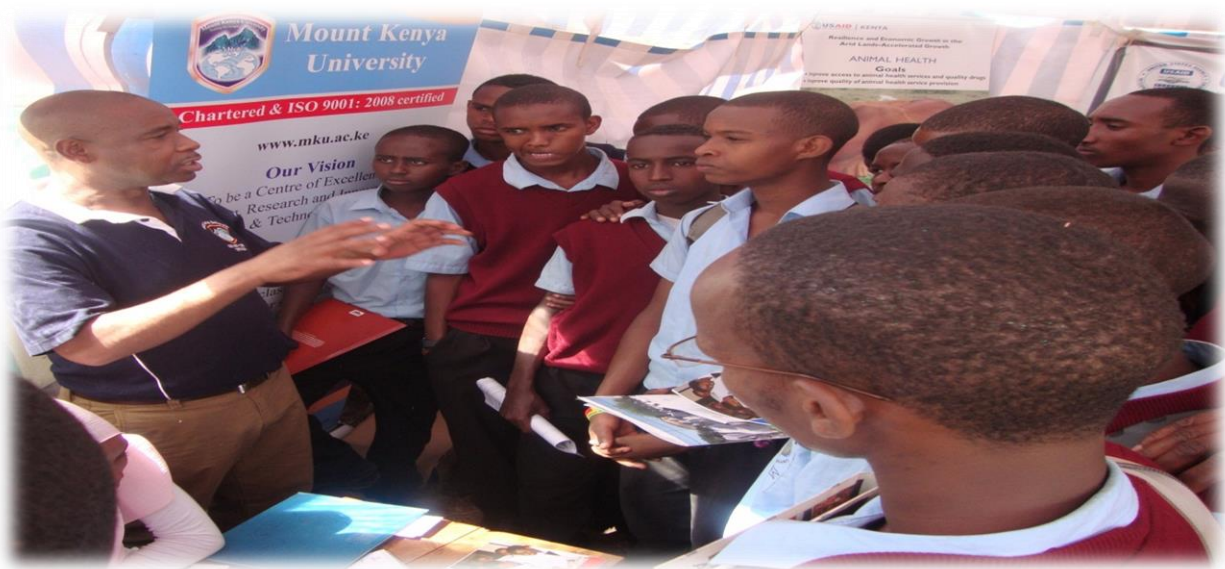
The data collection exercise was managed by consulting team of Mount Kenya University (MKU) and REGAL-AG played a support role especially in areas of logistics and capacity development amongst partners in the areas of Animal Health production and value chain. On the basis of terms of references, a number of data collection tools were used. A data collection team was assembled from both local students of the region and staff from MKU. The instruments used were In-depth interviews, focus group discussions and transect surveys within the area. Workshop was also conducted among the stakeholders and data collection was undertaken from the September 1 to September 10, 2013

As part of data collection as well as cost-cutting measures, field work tasks were divided between MKU and REGAL-AG partners and staff. MKU teams were responsible for conducting Key informant interviews among the identified stakeholders at local area, focused group discussions and transect surveys.

The main natural resources identified in Marsabit County are forests, rangelands, winds, and wildlife. Water is a key resource that is limiting and scarce in the area. The community livelihood activities include livestock, farming, fishing and business. The key challenges identified in livestock production include drought, inaccessible veterinary services, limited livestock extension services, emerging diseases and inadequate labor to take care of animals.

The main issues surrounding education in the County are unavailability of education institutions, education infrastructure, enrolment and retention. Retention from standard one to form four is

about 50%. The enrolment has been increasing in time as a result of campaign that has been going on for the last two years by UNICEF. The ratio of boys and girls who complete high school is about 1:2 (girls' vs boys). The reason why enrolment for girls is low is because girls put less effort in academic work, early marriages and lack of role models for the girls. Challenges for school enrollment in the County were identified. The transition rate from secondary school to University or tertiary learning institutions is low due to the above mentioned issues. The percentage of students qualifying for University requirements in the County are 20% out of total group. The study identified measures to increase transition to University.



**Photo; Dr. Mutundu the dean, School of Social Sciences explains higher education opportunities available at MKU to high school students during collection of baseline information on opportunities for interventions in upgrading animal health services and production in Marsabit County.**

The study established that the County has some training institutions operating within the region, which include Kenyatta University with satellite campus, University of Nairobi, Catholic church tertiary colleges among others but of interest was the fact that courses offered in this institutions do not meet the needs and requirements of the livelihoods and resources of the community. They offer courses such as Arts, carpentry and Education. This is a gap and opportunity for Intervention to offer tailor made courses which includes; Animal Husbandry, Veterinary

medicine, Community Development and livestock field extension. This would upgrade Animal health production and service delivery.

The County has vast opportunities for upgrading animal health and livestock and livelihoods of majority at large resulting from the challenges that the community has gone through over the past years.

Identified in the study were various service providers in the Animal health industry and with each playing their roles towards upgrading the livestock industry. Financial institutions, Non-Governmental Organization, Training Institutions, Government and County Government when interlinked would mostly raise the living standard of the community.

There is training needs for capacity building in the County for Animal health and production. The Study identified key topics desired for training and further empowerment.

Lack of information was highlighted as one of the hindrance to information on training and capacity building opportunities. The participants therefore proposed the need to use more strategies to reach to the locals such as marketing in the community training opportunities, visit to locations and interactions with community opinion leaders, visit to schools for career talks and attending price giving ceremonies. To offer training, service providers would need to know the available infrastructural state and needs of the community. The study identified possible venues and spaces where training/classes can be carried out. The team also identified avenues through which the trainees will raise fees to enroll for training. The community in the event of trainings and scholarship will benefit in a number of ways that will improve their livelihoods. Participants also made proposals on how the training programmes can be made sustainable

There exists some opportunities for job creation for the graduates in the region. Having attained the necessary training the graduates can benefit from county employment, NGO employment or get self-employment though opening of private agro vets and private practice.