



# **UNIVERSITY OF EMBU**

## **1<sup>ST</sup> ANNUAL POSTGRADUATE SEMINAR**

**HELD ON**  
**25<sup>TH</sup> MAY 2017**  
**IN**  
**UNIVERSITY OF EMBU'S CHARTER HALL**

# **PROCEEDINGS OF FIRST ANNUAL POSTGRADUATE SEMINAR**

**Date: 25 May 2017**

**Venue: University of Embu, Charter Hall**

**Organized by: The Board of Postgraduate Studies**

**Rapporteurs: Mr. Paul Waweru N. & Ms. Beatrice W. Gitonga**

**Compiled and Edited  
by  
Prof Nancy Budambula  
Director, Board of Postgraduate Studies**

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## Executive Summary

The First Annual Postgraduate Seminar of the University of Embu was held at the University's Charter Hall on 25<sup>th</sup> May 2017. The one day seminar brought together thirty-five members of academic staff, one external supervisor and sixty-three postgraduate students. The Seminar was an opportunity for postgraduate students to share the progress made in their research work. In his opening remarks, the Vice Chancellor affirmed that importance placed by University Management on postgraduate studies. The management has established the Board of Postgraduate Studies, appointed a Director of postgraduate studies, recruited of qualified and experienced staff as well as provided supervisors among others. The Vice Chancellor further noted that only 20% of the postgraduate students presented their research findings. He called upon Deans, Chairmen of Departments, Supervisors and Students to do more to ensure that students are progressing as expected. To improve the quality of postgraduate research output, the University of Embu has put several measures in place including; publications requirements for all postgraduate students, antiplagiarism check, training and sensitization of supervisors on effective supervision, recruitment of competent staff with excellent research, publications and student supervision experience. Impressive presentations were made by the students. Some of presentations indicate that the students may produce results that could be published in high impact journals, patented or commercialized. The importance of choosing the correct research design and data analysis tools was observed in several presentations. The need to improve the quality of slides and style of presentation was echoed throughout out the seminar. Supervisors were requested to do a bit more in helping the postgraduate students master scientific communication and the art of public speaking. This was the first seminar its kind at university level. It is envisaged that the University Postgraduate Seminar will become an annual event.

## Seminar Programme

Thursday, 25<sup>th</sup> May 2017

8:00 a.m. – 8:30 a.m.	Arrival and Registration - BPS Secretariat	
	<b>OPENING SESSION</b>	
8:30 a.m. – 8:35 a.m.	Opening Prayer	<b>Dr. Fredrick Njoka</b>
	Introduction and Announcements	<b>Prof. Nancy Budambula,</b> <i>Director, Board of Postgraduate Studies</i>
8:35 a.m. – 8:45 a.m.	Invite the Vice-Chancellor	<b>Prof. Kiplagat Kotut,</b> <i>Deputy Vice-Chancellor, (Academics, Research &amp; Extension), University of Embu</i>
8.45 a.m. – 9.00 a.m.	Remarks and Official Opening	<b>Prof. Daniel Mugendi,</b> <i>Vice-Chancellor, University of Embu</i>
9.00 a.m. – 10.30 a.m.	Presentations	
<b>10:30 a.m. – 11:00 a.m.</b>	<b>HEALTH BREAK</b>	
11.00 a.m. – 1.00 p.m.	Presentations	
<b>1.00 p.m. – 2.00 p.m.</b>	<b>HEALTH BREAK</b>	
2.00 p.m. – 3.30 p.m.	Presentations	
<b>3.30 p. m – 3.45pm</b>	<b>Plenary discussion</b>	
<b>3.45 p. m – 3.55</b>	<b>Analysis &amp; Synthesis</b> Dr Romano Mwirichia, Director Research	
<b>3.55 p.m.- 4.00 p.m.</b>	<b>Vote of thanks.</b> Ms Peris Nderitu, PhD student	
<b>3.55 p.m- 4.00 p.m.</b>	<b>Closing Prayer</b> Ms Judy Katumo, PhD student	
4:00 p.m.	<b>HEALTH BREAK</b>	

# PROCEEDINGS OF THE 1<sup>ST</sup> ANNUAL POSTGRADUATE SEMINAR, HELD ON 25<sup>TH</sup> MAY 2017

## Opening Prayer

The university management led by the University of Embu Vice Chancellor (VC) Prof. Daniel Mugendi arrived at the Seminar venue at 8.30am. Prof. Nancy Budambula, Director, Board of Postgraduate Studies (BPS) called the seminar to order for commencement. The seminar started at 8.30am with a word of prayer from Dr. Njoka, Dean School of Agriculture.

## Welcome Remarks by Prof. Nancy Budambula, Director Board of Postgraduate studies

The Director BPS welcomed all the attendees to the seminar and acknowledged their effort towards making the First Annual Postgraduate Seminar of the University of Embu a success. She expressed the commitment of the Board of Postgraduate Studies in transforming the postgraduate students into scholars. She then introduced the Board members including: Dr. Samuel Mwangi, Chairman Department Business and Economics; Dr. Fredrick Njoka, Dean School of Agriculture; Dr. Justin Nyagah, representative of the senate; Mr. Maore, Secretary to the Board and Prof. Kiplagat Kotut, the Deputy Vice Chancellor for Academics, Research and Extension (DVC ARE) who is the Chairman of the BPS. The Director, then invited the Deans of Schools who introduced their staff members and postgraduate students. She confirmed 22 presentations had been received and each presenter would be allocated seven (7) minutes for presentation and three (3) minutes for the questions and comments session. The Director then invited the Deputy Vice Chancellor (ARE), Prof. Kiplagat Kotut to make his remarks and invite the Vice Chancellor to make his remarks and officially open the seminar.

## Remarks by Prof. Kiplagat Kotut, DVC (ARE)

Prof. Kiplagat Kotut acknowledged the presence of all the members of staff as well as postgraduate students and thanked them for being punctual and in-attendance for the first ever Postgraduate Seminar of the University of Embu. He then emphasized the importance of the seminar and noted that the seminar was geared towards fulfilling the mandate of the institution, that is Teaching, Research and Community Service. He reaffirmed that the postgraduate seminar embeds the potential to carry out research due to the connection between research and teaching.

He also invited the participants to reflect on different aspects that contribute to developing scholars from postgraduate students. These included reflections on:

- i. Whether the concerned parties had inculcated the study culture whereby the reading culture is cultivated to match the dynamic science world where inventions and innovations are made day after day. This necessitates the need to be updated on the current knowledge on the different knowledge fields.
- ii. Quality of presentations that demonstration in put by the supervisors in preparing postgraduate students for scientific and public communication.
- iii. Mastering the art of writing. The presentations also demonstrate whether the art of writing had been mastered

The DVC also appreciated the impact of technology in modern postgraduate studies where he drew comparison between the current trend and the trend three decades ago when he was a postgraduate student. He noted that back then, research was more complicated and preparation of

a presentation more demanding. He traced the path presentations had taken from the use of 'positive film slides' that could take days to prepare to 'transparency slides' to the present where 'power point' and other computer packages are used to make slides from the comfort of your desk. Presentations been made easier in the current postgraduate studies from the way information is searched to the way presentations are prepared and relayed.

The DVC then welcomed the Vice chancellor to make his remarks.

### **The Vice Chancellor's remarks.**

The Vice Chancellor of the University of Embu, Prof. Daniel Mugendi, thanked all the participants present for finding time to attend the seminar and being committed to the course of making the University a dynamic epicenter of excellence in training and research for service to humanity. He emphasized the importance of the postgraduate seminar and confirmed inviting all the academic staff to the seminar in advance. He then proceeded to reading his speech of the day.

Members of the University Management and Senate, Supervisors, Staff, Postgraduate students, Ladies and gentlemen.

Good morning.

It gives me great pleasure to be here with you this morning to officially open the first Annual Postgraduate Seminar at the University of Embu. This is indeed a great moment for us all. This seminar will go down in the history of the University of Embu as the first one of its kind since the University opened its gates to students. I must thank the organisers of this seminar, led by the Director, BPS, Prof. Nancy Budambula and the Board of Postgraduate studies for coming up with the idea and bringing it to fulfillment. I also congratulate our postgraduate students, first, for choosing to pursue your graduate studies at UoEm and secondly, for making this seminar a possible by preparing your presentations well and being physically present today. I wish you all the best as you continue to work hard to complete any bits of your academic work that may be pending. For those who have not completed their research work, I encourage you to continue working hard so that you can complete within the stipulated timeframe. If you need any assistance, please feel free to consult your supervisors, your CoDs, Dean of School and indeed any one of us in the University who you think can be of assistance to you in your academic work.

Ladies & Gentlemen;

The University of Embu recognizes the importance of postgraduate training, and research in achieving the vision of becoming a dynamic epicenter of excellence in training and research for service to humanity. Equally the University Senate has, on numerous occasions during its meetings, deliberated on and passed important issues that are meant to enhance the quality of postgraduate training in the University of Embu. The University Management has also put in place various measures to ensure the smooth running of postgraduate studies in the University. Some of the measures include:

1. Establishment of the Board of Postgraduate Studies.
2. Appointment of the Director, BPS
3. Recruitment of qualified staff in all the Departments

4. Provision of supervisors
5. Research Support for Postgraduate students

Postgraduate students are in fact the main avenue through which universities carry out research. Excellent postgraduate training will improve the global visibility of the University. The status of our postgraduate students to date is as follows:

- Only 25% of PhD students who were given provisional admission to date have an approved proposal and are collecting data.
- Only 40% of Masters students in their second year have an approved proposal and are collecting data.
- Only 20% of our postgraduate students are presenting their research findings today.

These statistics show that we need to do more. I call upon Deans, CoDs, Supervisors and Students to do more to ensure that students are progressing as expected.

To improve the quality of postgraduate research output, the University of Embu has put in place the following:

1. Publications requirements for all postgraduate students. One paper for Masters and 2 papers for PhD.
2. Antiplagiarism check and clearance before any thesis or project is accepted for examination.
3. Training and sensitization of supervisors on effective supervision. One such training was held in December 2016.
4. Frequent training of postgraduate students on proposal writing, thesis writing, data analysis, use of E-resources and publishing.
5. Recruitment of competent staff with excellent research, publications and student supervision experience.
6. Frequent seminars at department, school and university level to share postgraduate findings.

Ladies and Gentlemen;

Today's seminar is the first one of its kind at university level. It is envisaged that the University Postgraduate seminar will become an annual event. I want to assure you that the University Senate will continue to support the Postgraduate Seminar series on an annual basis. In fact, it will be a pre-graduation requirement for all postgraduate students wishing to graduate from the University of Embu

Lastly, I want to wish you, the participants, all the best; I thank the presenters in advance for taking on the challenge to present your research findings at this seminar. For some of you, this may be challenging and may be the first time you are exposed to a seminar environment. I want

to assure you that this is part of the training meant to equip you with additional skills that will enable you participate effectively in similar forums and conferences around the world.

With those remarks, I wish you all a stimulating and inspiring symposium.

Ladies and Gentlemen;

It is now my humble pleasure to declare the First Annual University of Embu Postgraduate Seminar officially opened.

Thank you and God Bless you all

### **Presentations: Session One. Chairperson Dr Joan Oguna and Dr George Nyamato**

The Director BPS invited Dr. Oguna and Dr Nyamato to chair the first session of the postgraduate seminar presentations. Dr. Joan Oguna acknowledged the presence of all the presenters and invited presenters to present in the following order.

#### **Samson Muriithi**

**Title of presentation:** Performance ranking on mathematics teaching and learning: a case study of secondary schools in Embu County, Kenya.

**Questions and Comments:** A participant pointed out that something was missing in the title and sought clarification from the presenter on how mathematics as a single subject would solely affect performance ranking.

**Answer:** the presenter explained that interest in the mathematics subject as was the reason for choosing mathematics only for his study.

**Recommendation:** It was recommended that the presenter the effect of all combined subjects and take time to consult the supervisors on the matter.

#### **John Mwangi Githaka**

**Title of presentation:** Assessment of financial factors that affect liquidity of savings and credit cooperative societies in Kirinyaga County, Kenya.

**Questions and Comments:** The presenter was asked why he had chosen Kirinyaga County as his study area and not any other county. Another participant questioned the presenter on the objectives of the study. He noted that the presenter had made liquidity among the factors affecting liquidity itself which was his study parameter.

**Answers:** On the choice of study area, Mr. Mwangi said that his choice of the study area was influenced by the fact that Kirinyaga County was among the top drivers of economic development. On the objectives, He said that the main document would give more details about the issue of contention.

### **Miriam Mbithe Nzivo (JKUAT)**

**Title of presentation:** Characterization of human Herpes virus type 8 among Female Sex workers in Malindi, Kenya.

**Questions and Comments:** A participant asked about the justification of choice of study area, that is Malindi not any other area which has sex workers and also sought to know on how the presenter/researcher got the 268 study participants. Another participant sought to know the difference between HHV-8 and HIV. The Chair of Session noted that the presentation suggested that HHV-8 was associated with marriage whereas in conclusion the report concluded that HHV-8 was non-sexual related. She noted this was a contradiction.

**Answers:** On choice of study area and study participants, Ms. Mbithe said that the presence of existing structures in Malindi and organizations that work with the female sex workers made it possible to get the sample population. She also accrued her decision and study access to the tourism aspects of Malindi which is to an extent related to the sex work activities. On differentiating HHV-8 from HIV, Ms. Mbithe explained that HHV-8 is a double stranded DNA virus while HIV is a single stranded RNA virus. On the contradiction mentioned by Dr. Joan, Ms. Mbithe said that HHV-8 transmission could be through other media such Saliva but sexual contact was a prevalent mode of transmission.

### **Zephania Rwanda Mbaka**

**Title of the presentation:** Strategic determinants of intrapreneurial orientation at the Kenya Institute of Management. Kenya.

**Questions and Comments:** The Chair of Session noted that from the results, time availability had the lowest rate whereas in conclusion time was among the main determinants. She noted that as a contradiction of the research. Another participant sought to know who were the target population of the study. A participant enquired on the theory that guided the study. Why the researcher chose strategic determinants and not just determinants or other determinants.

**Answers:** On the time factor contradiction, Mr. Mbaka said that the question would be addressed in the entire presentation. On the target population, Mr. Mbaka said that his target population was the employees of the institution, that is, the secretariat who have the role of driving the institution.

**Comments:** Mr. Mbaka was advised to consult widely with the supervisors to clear on the contentious areas of the study.

### **Justine Miriti Majau**

**Title of Presentation:** Performance appraisal of employee performance: A case study of Senior Management in Public teacher training colleges in Kenya.

**Questions and comments.** The presenter was asked to justify how he chose the sample colleges to study and if they were representatives of the other colleges. A member of staff asked about the relationship of the study objectives. A participant noted that performance appraisal had been widely researched and enquired on further areas of study.

**Answers:** Mr. Majau stated that there were 24 colleges and the study involved all the 24 colleges. He also cited the acceptance of the colleges for the performance appraisal study. On objectives relationship, Mr. Justine said that it would be done further. Concerning other areas of research, Mr. Justine said that after completing the second objective of the study, he would recommend a study on the qualification of the appraisers as opposed to heads of such as departments undertaking the performance appraisal.

### **Bridget Wanjiru Ndwiga**

Title of presentation: The effects of different fertilizer combinations on Napier grass (*Pennisetum purpureum*) productivity in Embu County, Kenya.

**Questions and Comments:** A participant asked for clarification on how urine fertilizer was measured or quantified for use and whether the application considered the season variability due to the leaching effect. Another participant pointed out that the recommendations contradict the research work. It was further noted that cost effectiveness and that the factors did not come out clearly.

**Answers:** Concerning how the rabbit urine was measured, Ms. Ndwiga explained that the rabbit urine was diluted and sent to KALRO for analysis. She also acknowledged that the last objective on cost effectiveness had not been conclusively tackled and therefore the missing information would be presented upon completion of the study.

**Recommendation:** It was recommended that each objective be answered and analyzed differently.

The first session ended and the members took a health break.

### **Presentations: Session Two. Chairperson Dr. Simon Karuku and Dr. Phyllis Muturi**

The Director BPS called the second session to order and invited Dr. Karuku and Dr. Phyllis Muturi to chair the second session. Dr Karuku invited presenters of the second session.

### **Allan Shivachi**

**Title of the presentation:** Pyramiding resistant genes for major bean diseases occurring in Western Kenya through marker assisted selection.

**Questions and Comments:** A participant observed powerful publications could emanate from the research and encouraged Mr. Shivachi to start writing them. Another participant asked for clarification about genes for major bean diseases and sought clarification on existence of classification of bean diseases.

**Answers:** Mr. Shivachi said that the reason he used the term “major” bean diseases was based on the evaluation of the economic damage on production loss. He cited that the diseases affect even the seeds or result in 100% loss and are dominant in bean growing areas.

### **Petronilla Shivachi.**

**Title of the presentation:** Performance contracting and employee service delivery at Kirinyaga University, Kenya.

**Questions and Comments.** A participant questioned the disclosure of identity of the institution and choice of Kirinyaga University as the study area of the research. Another participant asked for clarification of the problem being addressed in the research. The use of a structured questionnaire in data collection was also questioned. It was noted that based on the type of research that was being undertaken, semi structured questionnaire would have been better since the research involved open ended questions. The presenter was advised to use binary correlation as opposed to regression correlation.

**Answers:** Concerning the choice of study area, Ms. Shivachi explained that the choice was influenced by the ease in accessibility of Kirinyaga University. In regards to the research problems, Ms. Petronilla argued that her research was driven by the fact that there were various duties assigned to staff members that are not captured in the performance contracting targets and during evaluation whereas the duties were of importance.

### **Caroline Chepkorir Koech (JKUAT)**

**Title of the presentation:** Predictors for HTLV and HIV among intravenous drug users in Malindi, Kenya.

**Questions and Comments:** A participant commented on the results shown on the graph of infections. He noted that the background and the research findings would agree but it was not very clear. Another participant commended the way of presentation by Ms. Caroline and recommended it to other social scientists in the seminar.

### **Harriet Karimi Gatuma**

**Title of the presentation:** Effect of technology and information systems on revenue collection by the county government of Embu, Kenya.

**Questions and Comments:** It was noted with concern that of Ms. Karimi was presenting a topic different from the one sent to the Board of Postgraduate Studies prior to the presentations day. A participant questioned the study design employed by the presenter. It was noted that the study design did not go hand in hand with the analysis. The presenter was questioned on how corruption was determined. The presenter was advised to work closely with her supervisors.

### **Ann Gathigia Waruita**

**Title of the presentation:** Student social identity development and academic achievements: A case study of selected universities in Kenya.

**Questions and Comments:** A participant questioned the research problem and sought to know how the findings of the research would contribute to the existing body of knowledge in the presenter's field of research.

**Answer: Ms Waruita** responded that the findings would increase the public knowledge on the relationship of the research variables. A member of staff recommended a more thorough scrutiny of the research problem and proper alignment to the objectives of the study.

**Peterson Mutembei Kugeria.**

**Title of the presentation:** Investigation on alternative and locally viable method for extraction of copper from their ores using hydrazine prepared from chicken waste.

**Questions and Comments:** The Vice chancellor commended the research work and proposed that the idea be considered for patenting and commercialization. A participant observed that the title of the research was structured on a point of knowing rather than not knowing, that is, the question of a viable option rather than viability of the option. He also questioned the focus of the research; was it preparation of hydrazine or quality of hydrazine?

**Answers:** Concerning commercializing the idea in Kenya, Mr. Mutembei cited the fact that Kenya does not mine copper and relies on importing. This therefore would be a limiting factor in its applicability locally due to the economic viability. On the focus of research, Mr. Mutembei said that his idea was in applicability, that is, use of the technique to see if it could be used for mass production of hydrazine due to the high cost of commercial hydrazine.

**Peris Wangari Nderitu**

**Title of the presentation:** The Tomato Leaf Miner (*Tuta absoluta*) prevalence and farmer management practices in Kirinyaga County, Kenya.

**Questions and Comments.**

Dr. Macheti made a comment that the title compounded several things together through the use of “and” and then the main objectives would be two as per the title.

**Recommendation:** It was recommended that the data of the research be broken down to occurrence, severity and ultimate effects.

**Francis Kimani Ngure**

**Title of the presentation:** product innovations and financial performance of savings and credit cooperatives societies in Kirinyaga County, Kenya.

**Questions and Comments:** A participant questioned the validity of the research problem statement. As per a previous research done in 2008 in the same field, it was found that Sacco sector performance had been improving yet according to Mr. Ngure’s problem statement, Sacco sector was declining. This therefore was noted as a contradiction to the existing data statistics.

**Recommendation:** It was recommended that the objectives of the research be dissociated.

### **Judith Wafula Katumo**

**Title of the presentation:** Agronomic performance of selected Chick pea varieties in Mbeere Embu County, Kenya.

**Questions and Comments:** The presenter acknowledged that her research had not yet produced results since she had not yet completed the study.

**Recommendation:** It was recommended that the researcher does some more work on identifying whether the crop was indigenous or a new breed, meaning of the name and the background of the crop. He also advised that literature review be done well.

### **Daniel Mutiso Nthiwa**

**Title of the presentation:** Participatory epidemiology of foot and mouth Disease among the Maasai pastoralists living in Wildlife-livestock interfaces, Maasai Mara, Kenya.

**Questions and Comments:** The choice of Anthrax and Foot mouth diseases for the research while Tripanosomiasis was a more prevalent disease in cattle was questioned.

The second session ended at 12.57 pm and Dr. Phyllis invited the Director BPS for housekeeping announcements. Members then took a lunch break.

Presentations: Session Three. Chairperson Dr. Justin Nyagah and Dr. Samuel N.Kariuki

Director BPS called the third session to order at 2.00PM. She introduced Dr. Justin Nyagah and Dr. Samuel N.Kariuki as the chair and co-chair of the session respectively. Presenters were invited to present as follows:

### **James Muchoka**

**Title of the presentation:** Mycorrhizal fungi associated with *Aspilia pruliseta* on phosphorous availability to sorghum plants.

**Questions and Comments.**No questions or comments from the members.

Mr. Muchoka informed the members that the presentation had the proposed actions to be undertaken to get results. He further informed the members that some equipment required to undertake the research were already acquired such as the seeds, hormone of interest and the required field for experimentation.

**Nathan Okoth Oduor.**

**Title of the presentation:** Enhancing soil water productivity using selected soil management technologies in the central highlands of Kenya.

**Questions and Comments:** A participant asked to for clarity on the difference between water productivity and soil water productivity as in the objectives. He advised that the presenter distinguishes the two different water parameters distinctively. He also noted that in the findings of the research, water productivity was not reflected and instead represented as soil moisture productivity. The two parameters were supposed to have different data findings. Another participant asked about the consideration of the underlying soil dynamics in implementing the different technologies and whether the differences would have affected the findings of the research.

**Answers:** In regards to the effects of the difference in soil properties, Mr. Oduor said that the areas of study had Nitisols and thus were uniform. On the difference between water productivity and soil moisture productivity, Mr. Oduor explained the difference though the research findings weren't clearly distinguishing the two parameters.

**Abel Nyangemi.**

**Title of the presentation:** Organizational factors that influence implementation of strategic plans in private secondary schools in Nairobi County, Kenya.

**Questions and Comments:** A participant asked if there were schools that were implementing strategies that were not formulated and in a situation where no strategy existed, what was in place in such a school? He also questioned on having more than three dependent variables and how independent correlation would be done in such a case. Another participant commented on the methodology citing that regression correlation was not much related to the variables where answers would be either "yes/no" and he thus recommended binary correlation.

**Ileri Muthee Arphaxard.**

**Title of the presentation:** Production constraints and impacts of Shubhodaya-mycorrhizal bio fertilizer on banana (*Musa spp*) productivity in Embu County.

**Questions and Comments:** A participant questioned whether the assertion that "banana is a heavy feeder" was new or known and whether it was part of the research to determine that. He also noted that the research title had many variables to be investigated and questioned the need to have the constraints and effects of the mycorrhizal bacteria at the same time. He advised Mr. Ileri to focus on one for better results and to deliver good output in the research work. Another participant asked whether fractions of NPK added did consider the level of amounts already existing in the soil. It was further noted that the broad objective of the study was wrongly stated and that the research conclusions and recommendations did not tally with the objective.

**Recommendations:** Mr. Ileri was advised to liaise with his supervisors in order to make the necessary alterations.

## **Erick Oduor Otieno**

**Title of the presentation:** Effect of integrated soil nutrient management technologies on maize (*Zea mays* L.) productivity in farmer-managed trials in the central highlands of Kenya.

**Questions and Comments:** There were no questions or comments.

The third session ended at 3:15pm and the chair of the session invited the Director BPS to take over the plenary session.

## **Plenary Discussion**

The Director BPS welcomed observations, questions and comments from the participants not only regarding the presentations but the seminar as a whole. Some of the major contributions during the plenary were:

Postgraduate students were advised that in future they should ensure that supervisors approved the power point presentations before presenting the same to the public.

A member of staff asked about the available funding opportunities in the University of Embu and the accessibility to the postgraduate students.

A participant pointed out that students should be aware of what is a proper PowerPoint presentations in terms of content.

A participant questioned the presentation mode of some presenters where he noted that some presentation slides were too wordy and invisible to some extent. He recommended an improvement in slide preparations.

The students were advised to avoid using “we” when presenting their research since its individual work. He also proposed that the University of Embu adopts branded slides as a standard measure for the university as is the case in universities in Germany.

It was noted that there is need to use the correct methodology as methodology affects the results of a study. A mix up of research designs also impacts negatively on the study results of the conducted research. Students were encouraged to master the different methodologies and data analysis techniques to aid in reducing the workload during their research

One of the postgraduate students requested the supervisors to step up on their supervisory work to improve the students’ output.

It was noted that that absence of a locally done research on a given subject does not mean the research is new nor guarantee the research to be undertaken. study.

Two postgraduate students appreciated the seminar and requested the Board of Postgraduate studies to organize more of such seminars to better equip the students in the ways of presenting and defending their research work.

One of the academic staff members present encouraged the students to exploit the diverse potential in tools of analysis as taught in class work. Most of the presentations made in this seminar did not make of the tools and models taught to students during course work.

To improve the publishing skills of the students a workshop for the postgraduate students in July 2017.

After the members' comments, The Director, BPS then invited Dr. Romano Mwirichia the Director for Research and Extension (DRE) to make his remarks and address the questions on funding.

### **Analysis and synthesis of the seminar. Director, Research and Extension Dr. Romano Mwirichia.**

The Director, Research and Extension, Dr. Mwirichia reminded the members that the tendency to dismiss fields that are not understood by the participants should be discouraged and the different fields should be appreciated in their own right.

He also stressed on the fact that research of postgraduate studies takes a lot of time, effort and resources and therefore the results should be packaged in a very good way. This was in relation to the fact that the impression the package makes to the panel either makes the panel agree or disagree with the research findings.

Dr. Mwirichia reminded the postgraduate students that the results presented were evidence of their work and the results should be treated with utmost importance. Slides for presentation should have minimum words and copy pasting of word documents in presentations should never be an alternative. Negligence should be avoided since it would cost the research output during presentation.

He also cited the need to improve the mode of delivery while also taking questions asked and criticism positively to improve their research findings. He encouraged the postgraduate students to exude confidence during their presentations since its key in their academic career.

He pointed out that presentations are highlights of what the speaker intends to say or discuss and that they help control the pace of what is being presented.

In regards to funding opportunities, Dr. Mwirichia informed the members that NRF would be making a call for proposals and students should prepare and work with their supervisors early enough to avoid rushing in the last minutes.

Finally, Dr. Mwirichia acknowledged the importance of frequent seminars on postgraduate presentations and even suggested involving presentation of research work from the higher officials in management to impart knowledge to juniors in the academic cycle.

He then handed the proceedings back to the Director BPS who invited the Deputy Vice Chancellor (ARE) to make his closing remarks.

## **Final Remarks by Deputy Vice Chancellor (ARE), Prof. Kiplagat Kotut.**

Prof. Kiplagat Kotut thanked all the participants for being patient from the beginning to the end of the seminar and for their positive contribution throughout the presentation period. He exuded confidence in the fact that the institution was moving towards the right direction as far as postgraduate studies were concerned. In regards to the presentations made, he noted that some presentations were very good while others were not too good. The DVC emphasized that the quality of presentations reflects the supervision and the amount of work put in. He called upon the supervisors to step in and improve on the postgraduate students' research work. The DVC also supported the proposal of adopting standard quality of slides for the institution.

The DVC ARE stressed that research titles should be well aligned to achieve the objectives of the research study. He also advised the postgraduate students to ensure they have an appropriate research problem statement. He cited that in a case where a problem statement is not well stated, then the findings would not satisfy the research study. On data analysis, Prof. Kotut notified the students that the way the data is analyzed should always come out clear and that the tools of analysis should not take most of the work. He urged the students to improve their oratory skills and gave an example of the proficiency of Dr. P.L.O Lumumba in making presentations and speeches.

The DVC ARE emphasized the importance of departmental seminars and encouraged members from other departments to attend to broaden the knowledge base. In regards to issues raised on the university funding research, Prof Kotut informed the members that the necessary arrangements were underway and that the management was continuously engaging to forge a way forward in regards to the issue. He reiterated the importance of preparing early before the National Research Fund (NRF) call for proposals was made. He suggested that the proposals be put together and encouraged students to consider the previous calls and align their proposals properly as they await the upcoming call.

The DVC ARE assured all the postgraduate students that the academic staff members were available for consultations in the vast fields of knowledge and that they should take the opportunity to work together to improve their proposals and research work. He also proposed publishing the expertise of the members of academic staffs on different areas for postgraduate students to know who to approach on a given area of interest. The DVC ARE commended the organizers of the seminar, members of staff and the presenters for good time management throughout the seminar. He wished all the students well in their academic endeavors.

### **Vote of Thanks**

Ms. Peris Nderitu was invited to make the vote of thanks. Ms. Peris thanked the Almighty God for the gift of life and the good weather of the day. She thanked the Vice Chancellor for gracing the seminar. She also thanked the Board of Postgraduate Studies for organizing the seminar, the supervisors for their supervisory work, postgraduate students for the day's presentations and lastly the catering department for the day's meals and refreshments.

### **Closing Prayer**

Closing prayers was offered by Ms. Judith Katumo.

# ANNEX 1: BOOK OF ABSTRACTS





**UNIVERSITY OF EMBU**

**7<sup>st</sup>  
Annual  
Postgraduate  
Seminar**

**BOOK OF ABSTRACTS  
& PROGRAMME**

**25<sup>th</sup> May, 2017**

## **Welcome message from the Director, Board of Postgraduate Studies**

It is with great pleasure that I welcome you to the First Annual Postgraduate Seminar at the University of Embu (UoEm). It is envisaged that this Seminar will be held every year and will form part of the traditions of the postgraduate studies at UoEm. Research forms an important component of postgraduate studies in any university. Worldwide, most of the research in universities is done by postgraduate students. Since its inception, UoEm has made every effort to promote postgraduate research. Over the last three years, various activities aimed at uplifting the standard of postgraduate research have been held including training on proposal and thesis writing, E-resources and publishing. In this regard, Board of Postgraduate Studies remains committed to its motto of “*Transforming postgraduate students into scholars*”.

**Karibu!**

**Prof. Nancy Budambula**  
**Director, Board of Postgraduate Studies**

## ABSTRACTS

### **1. Performance ranking on mathematics teaching and learning: a case of secondary schools in Embu County, Kenya**

**Samson Muriithi**

Performance ranking in Kenyan education system has been the norm since 1940, where students and schools were ranked based on their mean score in high stakes tests. Over the last two years, however, there has been intense lobbying by various stakeholders with some, on the one hand, advocating for the discontinuation of this practice of performance ranking, and the others backing its retention. Several research studies have shown that ranking of schools and students exclusively on the basis of standardized national examinations is unfair, and negatively affects students' academic performance. The bulk of these studies, however, have been conducted in the West. There have been very few studies investigating the effects of performance ranking on academic performance in such developing countries as Kenya, yet this phenomenon of ranking is alive and well in these countries. This study seeks to investigate effects of performance ranking on mathematics teaching and learning in secondary schools in Embu County, Kenya. The participants for the study are mathematics teachers and students in secondary schools in Embu County. The study adopts a mixed method research design. Data are being collected through one-on-one semi-structured interviews, focus group discussions, and questionnaires. Analysis of quantitative data was done using chi-square, with frequency charts generated using SPSS used to present findings. Cross tabulation will be used to test variation of responses according to gender. This presentation is based on the preliminary findings of the quantitative data which shows that performance ranking encourages positive competition among learners, promotes the practice of private tuition and encourages examination malpractices among students, teachers and schools.

*Keywords: Performance ranking, mathematics teaching and learning, Embu, Kenya*

### **2. Student social identity development and academic achievement: A case of selected universities in Kenya.**

**Ann Gathigia Waruita**

University students identify themselves and are identified by others as members of the social community within the university. The development of social identity is a process enhanced by engagement with the various activities and components of the university. This presentation will be based on preliminary findings of an ongoing qualitative study investigating the role of student social identity in creating the university image among University students in Kenya. The study adopted a qualitative research design. The study was conducted in four Universities; two public universities and two private universities. The target population for the study included all the fourth year students in the selected universities. Data was collected by use of interviews. The qualitative data collected was analyzed manually by first transcribing the gathered information. This was followed by development of codes and finally categorizing the codes into themes. The emerging themes on the analysis of the data show that student's identification with the university can be linked to student satisfaction. Students who were satisfied with the university were found to engage in various behaviors that benefited them and the university, such as engaging in co-curricular activities as well as positively interacting with the institution. In addition, the quality of relationships between students and their lecturers is largely determined by the class size. Student to student relationship on the other hand is determined by the student's level of interaction. The rules and regulations of the universities shape the students social identity. In some cases, students feel the rules are humane and they identify and align themselves to the rules. In other cases, students view the rules as rigid and they just comply and conform to avoid problems with the university. The conforming or non-conforming to the rules by the students dictates how they view their university.

*Keywords: social identity, engagement, identity development, university image, Kenya*

### **3. Effect of technology and information systems on revenue collection by the county government of Embu, Kenya**

**Harriet Karimi Gituma**

Improvement of revenue collection in counties is the key to meeting their financial obligations leading to realization of their mandate to offer quality and timely services to the residents, the demand for which may exceed the available resources. Many counties have adequate revenue bases to finance the current level of services, but revenue collection levels are often low. According to reports by the Controller of Budget, revenue collection by 14 counties in Kenya fell below amounts generated by the former local authorities under their respective jurisdictions during the 2013/2014 financial year. In addition, the analysis showed that most counties failed to meet their local revenue collection targets. Several counties have been slammed with labour strikes and go-slows among their workforce due to delayed salaries and/or poor remuneration of employees working under the county governments. The purpose of this study was to establish the effect of technology and information systems on revenue collection by County governments in Kenya. The study was guided by technology acceptance theory. The study employed a descriptive survey research design. The target population of the study comprises all county government employees in Kenya. Purposive sampling and simple random sampling was used to select 102 respondents for the study. Content Validity was used as a validity test while Cronbach alpha coefficient was used for reliability test where a reliability coefficient of 0.7 was obtained and accepted. Data was collected using self-administered semi-structured questionnaires. Overall; it was found that technology and information systems had the effect on revenue collection. The study recommends a revision of the County's Act and the integration of information systems in the management activities of Embu County. The findings of this study shall be beneficial to county governments as they were in a position to establish corrective measures and formulate policies to harness revenue collection.

*Keywords: technology and information system, Revenue collection, County Governments in Embu, Kenya.*

### **4. Performance appraisal of employee performance: A case of senior management in public teacher training colleges in Kenya.**

**Justine Miriti Majau**

Efficient service delivery to citizens, necessitated management reforms like performance appraisal (PA) being instituted by the government in public institutions. Study aimed to evaluate the effect of PA on senior management employee's performance in Public Teacher Training Colleges (PTTCs) in Kenya. The study employed a mixed method research design. The target population was 2448 administrators, senior, and middle level appraised employees from PTTCs. The sample size was selected using stratified random sampling. Data was collected from 556 respondents including 234 employees who appraise and are appraised and 322 appraisee's. Questionnaires, interview guides and checklists were used in data collection. The validity of the instruments was established through piloting and expert opinions. Reliability of research instruments was tested in a pilot study through test-retest technique. A Pearson's correlation coefficient of 0.714 was considered reliable. Data was analysed using descriptive statistics and processed using the SPSS Version 17 Scomputer programme. The data analysed indicated that PA had a 74.6% impact on achievement of performance targets among employees, although 21.8% of the employees were concerned by the social distance level between the appraiser and the appraisee. As a result 81.2% of the employees engaged in various programmes to reduce the social distance level or acquire skills in order to be effective in achieving performance targets. Despite 61.2% of the respondents viewing PA as unnecessary monitoring tool, departments and staff who have achieved their targets recognise the appraisal method as a motivating factor. PA facilitated administrators to identify training needs among the staff for effective performance. The results of this study highlights the importance of PA in achievement of targets, enhancing employee motivation, enhancing employee personal development and in identifying training needs among employees. The results indicate that there is need for a more refined policy on PA based on its diverse role.

*Keywords: Appraisers, Appraisee, Performance appraisal (PA), Kenya*

## 5. Diversity and structure of prokaryotic communities within organic and conventional farming systems in central highlands of Kenya

Edward Nderitu Karanja

Soil microbial communities play a critical role in global carbon and nitrogen cycles either through production and consumption of greenhouse emission in soils or availing nutrients present in soil to plants. Anthropogenic activities such as the conversion of forested land to agricultural use as well as the land use systems precipitate changes in soil microbial communities diversity and function in different ways. For example, it has been hypothesized that conventional farming system undermine diversity and function of soil microbial communities unlike organic farming system. Our understanding of soil microbial community diversity and function is limited due to the fact that over 99% of microorganisms in the environment cannot be cultured by standard techniques. This uncultivable diversity play roles that are yet to be understood. Culture independent methods have in the recent years helped us understand microbial genetic diversity, structure and ecological roles within ecosystems. In this study, illumina sequencing and analysis of amplicons of both total community 16S rDNA and 16S rRNA cDNA were used to determine the diversity and structure of prokaryotic communities within the long term experiment trial sites in central highlands of Kenya. Preliminary results showed comparable profiles of bacterial and archaeal communities using 16S rDNA and 16S rRNA cDNA derived datasets. Bacterial groups were the most dominant within both datasets where at phylum level, *Proteobacteria* was the most predominant phylum with a relative abundance between 19.46 - 62.17% and 17.57 - 53.29% within the Thika and Chuka sites respectively. In comparing prokaryotic diversity between treatments, active microbial diversity (16S rRNA cDNA) was found to be higher in organic high treatment. Other major phyla that scored high relative abundance were; *Actinobacteria* (5.28% conventional high and 30.06% organic high treatment) at Chuka and Firmicutes, (2.49% conventional high and 19.32% organic high treatment) at Thika site. In terms of prokaryotic species richness, Thika organic low was found to be the richest treatment with 34 taxa. This would be attributed to soil management practices and soil chemical characteristics especially carbon, nitrogen, zinc and manganese levels that were significantly high in organic treatment soil.

**Keywords:** *community structure, microbial diversity, soil, conventional farming, organic farming*

## 6. Performance contracting and employee service delivery at Kirinyaga University, Kenya

Petronilla Serebwa Shivachi

The potential to increase service performance and delivery through performance contracting have seen accelerated effort in research in this relatively new concept of management in Kenya. Most studies have focused on performance management, performance measurement, commitment, and target meeting. The research sort to understand effects of performance contracting on employee service delivery at Kirinyaga University. The study adopted descriptive cross-sectional research design. The study population was 272 staff members of Kirinyaga University. Primary data was collected using a structured questionnaire that included both closed and open-ended questions. Secondary data was collected from journals. Pilot study was conducted in order to determine validity and reliability of research instruments. The Statistical Package for Social Science package was used in the data analysis. Descriptive statistical tools including the mean, mode standard deviation, and variance were used to analyze qualitative data. Inferential statistics was done by use of correlation and multiple linear regression analysis in order to establish the relationship between independent variable and the dependent variable. Analyzed data was presented inform of frequency tables, charts and graphs. The results revealed that performance contacting parameters significantly ( $t = 3.407, p < 0.05$ ) affected service delivery of the University. It was also revealed that target implementation significantly ( $t = 4.313, p < 0.05$ ) influenced service delivery. However, it was established that target setting ( $t = 1.816, p < 0.05$ ), and, monitoring and evaluation ( $t = 0.617, p < 0.05$ ) did not significantly influence service delivery at the Kirinyaga University. In conclusion, proper target setting, monitoring and evaluation, and target implementation are necessary in achieving employees and organizations' goals as well as satisfactory delivery of services to customers.

**Keywords:** *Performance Contracting, Target Setting, Target Implementation, Target Evaluation, Service Delivery, Kirinyaga University.*

## **7. Pyramiding resistance genes for major bean diseases occurring in western Kenya through marker assisted selection.**

**Allan Shivachi**

Common bean production is severely constrained by anthracnose, common bacterial blight, bean common mosaic and necrotic viruses. The seed borne nature and high pathogen variability complicates the management of these diseases. This study therefore, purposed to phenotype and genotype sources of resistance to these diseases and pyramid resistant genes into a common background aided by marker assisted selection (MAS). Parental genotypes; G2333, VAX 3 and MCM 2001 were phenotyped for their resistance to anthracnose, CBB and BCM/NV respectively in screen house at KALRO and disease severity scored on CIAT 9 – point scale. Genomic DNA was extracted using FTA method followed by PCR amplification using SCAR marker, and PCR product separated on agarose gel followed by ethidium staining. Parallel backcrossing scheme was used to combine the resistance genes into a common background with market-class qualities (KKCAL-194) aided by linked markers. The donor parents evaluated indicated that they carried the required resistance for CBB, anthracnose, BCM/NV and thus, could be used as donors for resistance in dry bean breeding programmes. The parents carrying resistance genes also have good combining ability with the market-class genotype to be improved for resistance to the diseases. Therefore, the development of varieties with broad resistance would offer a lasting solution to management of these problematic diseases.

**Keywords:** *Dry beans, anthracnose, common bacterial blight, bean common mosaic and necrotic virus, gene pyramid, MAS.*

## **8. The effects of different fertilizer combinations on napier grass (*Pennisetum purpureum*) productivity in Embu County, Kenya**

**Bridget Wanjiru Ndwiga**

Declining soil fertility is one of the major factors affecting crop production including pastures and is closely linked to declining agricultural productivity. It has been identified as the root cause of a declining *per capita* food production. The objective of the study was to investigate the effect of different combinations of fertilizers on Napier grass (*Pennisetum purpureum*) productivity. The experimental design was a Randomized Complete Block Design (RCBD) with three replicates per treatment. The treatments were as follows: Di Ammonium Phosphate (DAP); rabbit manure; rabbit manure and rabbit urine; DAP and Calcium Ammonium Nitrate (CAN); DAP and rabbit urine, Zero fertilizer and Conventional method. The Napier was established at the onset of the season 2015 using “Tumbukiza” method with pits measuring 90 cm length by 60 cm width by 60 cm breadth. The experiment was monitored for two seasons. Each pit was planted using 5 plants (canes containing 3 nodes). Data that was collected included: plant height, number of nodes, chlorophyll content, fresh and dry matter weight determined. Combination of DAP and rabbit urine fertilizer had the highest recorded levels of plant height and number of nodes. Plant height treatment means ranged between 85.21cm to 94.76 cm while number of nodes treatment means ranged between 3 to 5. Rabbit manure and Rabbit urine combinations had highest dry matter levels, the DM ranged between 0.15 t/ha to 1.21 t/ha across all the treatments. Soils where Rabbit urine was used as a top dress had higher increased levels of nitrogen and potassium while from where CAN was used there were high levels of Phosphorous. The most cost effective fertilizer combination on Napier production in Embu County was found to be DAP and rabbit urine combinations. Effect of different fertilizer combination had a significant effect on the dry matter yield of Napier grass. This study can help improve extension service through provision of an appropriate package to small holder farmers in increasing their production cost effectively.

**Keywords:** *Tumbukiza, Organic & inorganic fertilizer, Rabbit wastes*

## **9. Assessment of financial factors that affect liquidity of savings and credit cooperative societies in Kirinyaga County, Kenya**

**John Mwangi Githaka**

Savings and Credit Co-operative Societies (SACCOs) are quasi financial institutions that mobilize savings, provide loans as well as other products to their members. Liquidity is considered as one of the serious concern and challenge for the modern era SACCOs. A SACCO having good asset quality, strong earnings and sufficient capital may fail if it is not maintaining adequate liquidity. The objective of the study was to assess the effect of financial factors on liquidity of Savings and Credit Co-operatives Societies in Kirinyaga County, Kenya. Descriptive survey research design was used in this study. The target population consisted of all the 60 registered SACCOs in Kirinyaga County from which a sample size of 18 SACCOs was drawn. The study employed stratified random sampling technique. Primary data was collected by use of self-administered semi-structured questionnaires while secondary data was collected using audited financial statements of the SACCOs and regulator (SASRA). The data was analyzed using SPSS with the help of descriptive statistics and inferential statistics tools. The study findings will be of great importance to the SACCO management to formulate proper policies. Academicians and future scholars will get literature basis. The study will also help the regulator and the government to improve on the framework for regulation of SACCO's. The study indicated that the effect of liquidity management, net cash flows, credit lending and investment in non-core business on liquidity of SACCOs was positive and significant. The study concluded that it was critical for SACCOs to have adequate liquidity in order to ensure that they meet short term maturing obligations. The SACCO management must put in place financial strategies to ensure that liquidity is effectively managed on a regular and timely basis and that appropriate policies and procedures are established to limit and control material sources of liquidity risk.

**Keywords:** *liquidity, liquidity management, net cash flows, credit lending, non-core business, savings and credit co-operative societies (SACCOs)*

## **10. Performance of indigenous dairy goat up-grades in Manyatta and Runyenjes sub counties, Embu County**

**Augustus Musili Kiema**

A study was carried out in Manyatta and Runyenjes Sub Counties, to determine performances of filial upgrades realized from cross breeding indigenous goats and German alpine buck. Upgrades milk yield performance has never been evaluated, hence no available data to enable farmers make decisions on the best dairy goat upgrade to adapt. 236 filials performance data was extracted from recording cards provided by 64 farmers. Parameters considered included daily milk yield, lactation length, age at first kidding, birth weight and weaning weight. Data was analyzed using Analysis of Variance and mean milk yields separated using least significant difference at 5% level of confidence. Results showed significant differences in milk yield among upgrades ( $p < 0.0001$ ). F<sub>5</sub> had higher milk production per lactation (740±57.4 litres in Manyatta and 660±40.6 litres in Runyenjes). Manyatta had significantly higher milk yield in all filial types (452±20.6 lit/lactation) compared to Runyenjes 382±15.7 lit/lactation. A high positive correlation between milk yield per day and weaning weight ( $r = 0.603$ ,  $p = 0.0001$ ) and lactation length ( $r = 0.395$ ,  $p = 0.0001$ ) was observed. Filials mean birth and weaning weight slightly higher in Manyatta (3.12 ± 0.015, 9.86 ± 0.083 kg respectively) compared to Runyenjes (3.04 ± 0.015 and 9.12 kg respectively). Significantly high difference in lactation yield ( $p = 0.0001$ ) in high potential zone (530 ± 24.4) compared to medium potential zone (426±15.7) was noted. Mean birth weight in high potential area was significantly higher (3.11±0.015 kg) compared to medium zone (3.05 ± 0.015kg) ( $p = 0.024$ ). The superior performance of higher filial genotypes supports the aim of the upgrading program in using Alpine buck to upgrade local goats in Embu County. Information on upgrade milk performance is expected to assist farmers in selection of best filial generation for milk production stock.

**Keywords:** *Goats, Filials, Milk yield*

## **11. Strategic determinants of intrapreneurial orientation at the Kenya Institute of Management, Kenya**

**Zephania Rwanda Mbaka**

The global business environment is today faced with uncertainty and various complexities. While it is an uphill task to initiate the idea of intrapreneurship within organizations, ignoring the idea is suicidal to the survival of firms. In the quest to address the causation for intrapreneurial orientation in organisations, the present study investigated five independent variables namely; management support, work discretion, rewarding intrapreneurial efforts, time availability and organizational boundaries against one dependent variable (intrapreneurial orientation). The study, therefore, sought to address the strategic determinants of intrapreneurial orientation at the Kenya Institute of Management. The main objective of the study was to establish the strategic determinants of intrapreneurial orientation at the Kenya institute of management. The study population comprised of employees with strategic roles at the Kenya Institute of Management. Census survey was used in the study, data was gathered from every member of the population. Primary data was collected through a structured questionnaire measured on a five point Likert type scale. Inferential analysis was performed to determine the relationship among the variables. The study conducted correlation analysis to test the strength of association between the research variables using Pearson's Product Moment Correlation Coefficient ( $r$ ) statistical tool to help arrive at conclusions. The study established that intrapreneurial orientation is largely composed of three indicators. These are; proactiveness, innovation and risk taking. The study, also, established that the main strategic determinants of IO are; management support, rewarding intrapreneurial effort, work discretion, time availability and organizational boundaries. The findings agreed with previous study results. From the regression model, these five determinants contribute 61% of IO at KIM. Based on the findings of the study, it was concluded that Management support, work discretion, rewarding intrapreneurial efforts and time availability are the key determinants of intrapreneurial orientation in organizations.

**Keywords:** *Entrepreneurial orientation, intrapreneurship, entrepreneurship, strategic determinants, competitive advantage.*

## **12. Product innovations and financial performance of savings and credit cooperatives societies in Kirinyaga County, Kenya**

**Francis Kimani Ngunjiri**

Product innovations are crucial to sustain organizations' financial performance and raise their competitive strengths. SACCOS are the main drivers of economic and social development in rural areas of developing countries. In Kenya 81% of the population rely on the SACCOS to access financial services. However the use of SACCOS by Kenyans as a financial service provider has been declining. The SACCOS are faced with challenges of survival due to decline of members. The decline is attributed to the competition from banks which have embraced financial innovations. The study therefore investigated the effect of product innovations on financial performance of SACCOS in Kenya. The study adopted cross sectional descriptive survey research design. The target population was 60 SACCOS registered by SASRA to operate in Kirinyaga County. Stratified simple random sampling technique was used to obtain the sample size of fifty two SACCOS for the study. Primary data was collected using self-administered questionnaires while secondary data was obtained from audited financial statements. Primary and secondary data was analyzed using SPSS. The findings of the study revealed that product innovations were positively correlated to financial performance. The study will be of great importance to Policy maker in developing SACCO's financial innovations regulatory framework. SACCO Managers will be able to adopt the product innovations that will improve financial performance of the SACCOS and their competitiveness. The study will further enlighten researchers with relevant information regarding product innovations. The study recommends that SACCOS should embrace product innovations in order to improve their financial performance. SACCOS should therefore introduce new deposit accounts in order to increase the amount of deposits. The SACCOS should also introduce credit cards and debit cards in order to increase their revenue. Similarly, the SACCOS should introduce electronic fund transfer since they have a positive effect of increasing commission fee based income.

**Keywords:** *Financial Innovations, Product Innovations, Financial Performance, Savings and Credit Co-operative Societies (SACCOS)*

### **13. Investigation on alternative and locally viable method for extraction of copper from their ores using hydrazine prepared from chicken waste**

**Peterson Mutembei Kugeria**

In Kenya, mineral data shows several deposits of copper minerals yet the country continues to import copper products from other countries. Currently there are no locally established copper extraction industries despite having viable deposits. Copper minerals in Tharaka Nithi County, for example, contain mineral composition in excess of 4 % CuO. These minerals have never been earmarked for extraction because the common methods known for extraction are expensive. The objective of the study was to investigate on alternative and localized viable method for extraction of copper from their ores. The method yielded over 32 % by mass of copper from the ores. The extract had over 60 % by mass of copper. The results show that the *in situ* prepared hydrazine from chicken waste is a viable method of copper extraction.

**Keywords:** *Hydrazine from chicken waste, copper extraction.*

### **14. Organizational factors that influence implementation of strategic plans in private secondary schools in Nairobi County, Kenya.**

**Abel Nyagemi**

The study sought to find answers to the questions on implementation of strategic decision whereby it focused on Private Secondary Schools in Nairobi County. Specifically, the study aimed at determining the effects of top management commitment, coordination of activities, employee skills and responsibilities and organizational culture on implementation of Strategic Plans in Private Secondary Schools in Nairobi County. A descriptive study was used since it was seen by the researcher as a more appropriate design for answering research questions which ask 'how' and 'why' and which do not require control over the events. The study population consisted of 119 staff of different cadres employed at various Private Secondary Schools in Nairobi. Simple probability sampling technique was used and out of 101 private secondary schools in Nairobi, 50 schools were randomly selected. In each of the selected schools, Directors, Principals or Deputies, Head of Departments, Teachers or support staff had an equal probability of being selected. The researcher administered a survey questionnaire individually to employees who were the Target population. Data was analyzed using both inferential and descriptive statistics such as frequencies; percentages and graphs. Exploratory factor analysis was used in determining the influencing factors. The study established the following group of organizational factors as having an influence on implementation of strategic plans in private secondary schools in Nairobi: resource constraints (e.g. human and financial), overlapping activities, interference from the local government, work pressure, conflict of interest, poor attitude, overlapping plans and tight timeframes. The conceptual model was tested and found to be statistically significant relationship among the implementation of strategic plans, top management commitment, coordination of activities, employee skills and responsibilities and organizational culture. The study recommends a further study on the specific factors should be done in particular sub-counties to explicate on how those factors affect implementation of strategic management plans in Private Schools at the sub county level.

**Keywords:** *Strategy, Strategic Plan, Stakeholders, Organizational Culture, Management, Implementation, Culture, Communication*

## 15. The Tomato Leaf Miner (*Tuta absoluta*) prevalence and farmer management practices in Kirinyaga County, Kenya

Peris Wangari Nderitu

Tomato leaf miner *Tuta absoluta* (Meyrick, 1997) (Lepidoptera: Gelechiidae), is an invasive pest of tomato. It was detected in Kenya early 2014 however; there is limited information on the level of invasion of the insect pest in tomato producing areas. This study was aimed at assessing the level of invasion of *T. absoluta* and farmer management practices in Kirinyaga County. Tomato farmers were interviewed using questionnaires aimed at identifying management practices used by farmers to control *T. absoluta* and their knowledge on the insect pest. An extensive field sampling was further carried out on a set of 15 tomato farmers fields located in three locations aimed at assessing the existence and damage caused by *T. absoluta*. The presence of *T. absoluta* was confirmed by Delta traps (Koppert Biological Systems, Kenya) which were used to monitor incidence of *T. absoluta* across farmer's fields. 93% of farmers that were interviewed rated *T. Absoluta* as a major pest of tomato causing average fruit losses of 40.3%. Across the farmers fields mining damage caused by the insect pest on the lower, intermediate and upper leaves showed an increase in damage as the crop advanced in growth from 25% leaf mining damage at early stage of growth to 50-75% mining damage during the fruiting and harvesting stage. The results further showed that 94% of the respondents use synthetic chemicals in the control of *T. absoluta* with an average frequency of 12 times per growing season and the highest frequency at 16times per growing season. Increased use of synthetic insecticides has been found to negatively impact on the natural enemies. Our findings show that 52% and 46% of respondents stated that after chemical spraying natural enemies disappear and are killed respectively, while 2% did not know what happened to them. It is therefore imperative to design an integrated pest management program that is environmentally sound for sustainable management of *T. absoluta* populations.

**Keywords:** Delta traps, environmentally sound, *Tuta absoluta*, integrated pest management

## 16. Participatory epidemiology of Foot and Mouth Disease amongst the Maasai pastoralists living in wildlife-livestock interfaces, Maasai Mara, Kenya

Daniel Mutiso Nthiwa

A participatory epidemiological survey was conducted to assess the ethno-veterinary knowledge, attitudes, perceptions and practices amongst the Maasai pastoralists towards the major cattle diseases that limited their livestock production between September 2015 and October 2016, with major reference on foot and mouth Disease (FMD). A cross sectional study design was implemented in six villages that were selected depending on their locations relative to the park and livestock grazing practices used. Data collection was through focus group discussions that consisted of 8-13 farmers and used tools such as proportional piling, pairwise ranking, seasonal calendars and disease impact matrix scoring. The study revealed that the relative populations of sheep and cattle were higher compared to other domestic species and both were perceived important to household's livelihoods. The median scores, 10<sup>th</sup> and 90<sup>th</sup> percentiles for sheep and cattle were 39.5 (34.3, 44.7) and 27.5 (21.3, 32. 7) respectively. The results of disease impact scoring matrix indicated that Malignant Catarrhal Fever, East cCoast Fever, Foot and Mouth Disease, Contagious Bovine Pleuropneumonia, Anthrax and trypanosomiasis were the six important diseases that constrained livestock livelihoods in the area. The Kendall's coefficient of concordance for all discussants for the ranked diseases, showed strong agreement ( $W = 0.49$ ,  $p < 0.001$ ,  $n = 12$ ) confirming that they were common diseases in the selected villages. FMD was perceived to impact mostly on milk production than any other disease with median score of 4.5% (range: 1-11). FMD annual incidence was significantly associated with cattle age group ( $r = 0.66$ ,  $p=0.000$ ) and highest in those above four years, median score of 32.5 (range: 10, 50). The median annual age specific mortalities associated with FMD was reported highest among calves with median score of 4.5% (range: 2, 15) compared to other age groups. Results from this study will assist in the design of effective FMD control strategies.

**Keywords:** Participatory epidemiology, foot and mouth disease, Maasai pastoralists, Kenya

## **17. Predictors for HTLV and HIV among intravenous drug users in Malindi, Kenya**

**Caroline Chepkorir Koech (JKUAT)**

Human T-cell lymphotropic Virus type one and two (HTLV1/2) infections are highly prevalent among Human immunodeficiency virus (HIV) infected intravenous drug users (IDUs). Currently no published data addressing the burden of HIV and HTLV-1/2 co-infection among IDUs in Kenya exists. HTLV and HIV share similar routes of transmission and tropism for T-lymphocytes; as a result co-infection is common. This study determined the prevalence and predictors of HTLV-1/2 and HIV mono and co-infections among IDUs. A cross-sectional study was conducted using structured questionnaires and laboratory testing of blood samples from 351 consented adult IDUs in Malindi sub-county. HIV-1 serology was carried out using VironostikaHIVAg/Abdirect enzyme-linked immunosorbent assay (ELISA) protocol (Biomerieux Diagnostics, France) while HTLV serology was done using HTLV1/2 sandwiched Elisa (Sunlong, China). Of the 351 recruited IDUs (mean age 33.1years), 34 (9.7%) were positive for HIV, 20 (5.8%) were HTLV1/2 positive while 3(0.9%) were HTLV-HIV co-infected. Prevalent HIV infection was significantly associated with being homeless (OR=2.5, P=0.009), needle sharing (OR=2.1, P=0.042) and previous history of gonorrhea and syphilis (OR=3.7, P=0.000). On the other hand, prevalent HTLV-1/2 infection was significantly associated with residing in Malindi town (OR=7.9, P=0.043), unprotected anal sex (OR=3.1, P=0.029) and previous history of gonorrhea and syphilis (OR=2.9, P=0.021). No factors were significant for HTLV/HIV co-infection. These results show that high risk injection and sexual behaviors are significant markers for HIV and HTLV1/2 infections. Routine testing of HTLV should be done in outpatient IDU clinics. Fast-tracking integrated public health intervention approaches and adoption of harm reduction strategies could help to alleviate the burden of blood-borne infections among IDUs.

**Keywords:** IDUs, HIV, HTLV, Malindi

## **18. Characterization of Human Herpes Virus type 8 among Female Sex Workers in Malindi, Kenya** **Miriam Mbithe Nzivo (JKUAT)**

Human Herpes Virus type 8 (HHV-8) is not ubiquitous as it displays an extremely unusual distribution pattern around the world. The prevalence of HHV-8 in sub-Saharan Africa is about 50-60% in general population. The risk factors associated with HHV-8 range from socioeconomic to geographic and behavioral characteristics. Its prevalence is high among high-risk groups such as female sex workers (FSWs). Documented studies on HHV-8 in Kenya are very few and data on the virus is scanty. This study aimed at determining the prevalence of HHV-8, risk factors associated with the virus and its co-infection with Human Immunodeficiency virus (HIV) and subtypes present among FSWs population in Malindi sub-County. A cross-sectional survey involving 268 participants was conducted and blood samples were screened for antibodies against HHV-8 using enzyme linked Immunosorbent assay (ELISA). Socio-demographic characteristics were documented using a questionnaire. The prevalence of HHV-8 mono-infection was determined at 25% (67/268), 16.4% (44/268) for HIV mono-infection whereas syphilis mono-infection accounted for 2.24% (6/268). Of those infected with HHV-8, a co-infection of 12% (8/67) was observed with HIV. Of the risk factors evaluated, marriage was a significant risk factor in HHV-8 infection (OR 2.90; p=0.043). There was no significant association between HHV-8 and HIV seropositivity (OR 0.62; p=0.257) or syphilis positivity (OR 1.52; p=0.636). HHV-8/HIV co-infection was associated with increased age (OR 11.21; p=0.027) and syphilis infection (OR 21.33; p=0.001). Unlike HIV and HHV-8/HIV co-infection, HHV-8 was not associated with age. In conclusion, as opposed to HIV infection, this study presents no association of HHV-8 with high-risk sexual behavior. The lack of association of HHV-8 with high-risk sexual behavior suggests that sexual route may not play a significant role in transmission of HHV-8 in this population. There is an urgent need for health education for sex workers and the general population on the various modes of transmission of HHV-8.

**Keywords:** HHV-8, Female sex workers, Prevalence, subtypes, HIV co-infection, risk factors

## **19. Enhancing soil water productivity using selected soil management technologies in the central highlands of Kenya**

**Nathan Okoth Oduor**

Water unavailability due to scarcity, poor distribution and high variability of rainfall in the Central highlands of Kenya (CHK) and decline in soil fertility have contributed to continuous decrease in water productivity. The study sought to establish the effects of selected soil management technologies on water productivity in Tharaka-Nithi and Murang'a Counties. The experiment was laid out in randomized complete block design with tillage and soil inputs as combined treatments. The Tillage practices used were minimum and convectional tillage while soil inputs included mineral fertilizer, crop residues, animal manure, *Tithonia diversifolia*, rock phosphate, legume intercrop. The data collected include weekly soil moisture, daily weather data, 19 years historical rainfall data, yield data and soil samples for physical properties. The yield, soil physical properties and moisture data under different treatments were subjected to analysis of variance using Mixed Procedure Model in SAS 9.3 software. Differences between treatment means was examined using Duncan's Multiple Range Test at  $p=0.05$ . For rainfall characterization RAIN software was used to analyze historical rainfall data for onset and cessation dates. Cumulative departure index and rainfall anomaly index (RAI) was used to analyze long term trends of annual and seasonal variability. Treatments had significant effect on soil water content but had no significant effect on soil physical properties. Onset dates varied highly for both short and long rain seasons in the two counties while cessation date remained constant in both rainy seasons in the two counties. Rainfall variation across the years was high on the short rains then longs rains with the annually rainfall variation being the least. The result of the experiment will be useful to various stakeholders in agriculture for planning and decision making purposes in regards to water productivity. It will also provide a baseline for further research and development work.

## **20. Effect of integrated soil nutrient management technologies on maize (*Zea mays* L.) productivity in farmer-managed trials in the central highlands of Kenya**

**Eric Oduor Otieno**

Declining soil fertility is a serious threat to food and livestock productivity systems in Sub-Saharan Africa. Maize (*Zea mays* L.) productivity in Central Highlands of Kenya is affected by the declining soil fertility. A study was conducted during the 2016 long and 2017 short rains to determine effects of selected integrated soil nutrients management technologies on maize productivity under on-farm conditions. The experiment was laid out in unbalanced block design combining two tillage methods with fertility inputs. The data were subjected to analysis of variance using General Linear Model in SAS version 9.2. Treatment means separation was done using Duncan Multiple Range test. There were significant decrease in bulk density only in two treatments under conventional tillage and none under minimum tillage. The highest grain yields (2.4629 Mg/ha and 0.29326 Mg/ha, long and short rain seasons, respectively) were observed under a combination of minimum tillage, crop residues, mineral fertilizer and animal manure (MINRMfM) during the two seasons in Meru South compared to conventional tillage-control (CON-C) (0.7605 and 0.02756 Mg/ha) and minimum tillage-control (MIN-C) (1.1169 and 0.06007 Mg/ha). Minimum tillage, crop residues, *Tithonia diversifolia* and rock phosphate (MINRTiP) and minimum tillage, crop residues, animal manure and legume intercrop (MINRML) had the highest yields (2.7371 and 0.1195 Mg/ha) in Gatanga during long and short rain seasons, respectively, relatively the yields observed CON-C (0.2384 and 0.00621 Mg/ha) and MIN-C (1.154 and 0.0123 Mg/ha). Stover yields increased by 0.33193 and 0.32809 Mg/ha from CON-C and MIN-C, respectively in Meru South and by 0.16981 and 0.14171 Mg/ha in Gatanga to MINMf during the long season while MINRMfM (0.222 Mg/ha) and CONRMf (0.20963 Mg/ha) performed the best in Meru South and Gatanga, respectively during the short rain season. In conclusion, integration of resources offers a suitable solution to declining maize productivity.

## **21. Production constraints and impact of shubhodaya- mycorrhizal bio-fertilizer on banana (*Musa spp*) productivity in Embu County**

**Arphaxard Muthee Ileri**

Banana (*Musa spp*) is one of the most nutritious fruits in the world and with medicinal value. Bananas accounts for 20% of cash crops grown in Embu County. However, its production potential has not been fully realized which stands at 1.52 tons per hectare against international yield levels of 40-50 tons per hectare per annum. A survey and field trials were carried out to determine banana production constraints and evaluate the effect of Mycorrhizal bio-fertilizer on banana productivity in Embu County. To evaluate the effect of Shubhodaya-Mycorrhizal bio-fertilizer on banana productivity, field trials were conducted in farmers' fields in five sites namely Nthambo, Njukiri, Runyenjes, Ugweri and Riandu. This was preceded by soil tests and analysis to determine soil fertility components and the soil pH in the target areas. Six treatments designated as T<sub>1</sub> - 5gm NPK fertilizer alone (control); T<sub>2</sub> - 5gm NPK + 20gm bio-fertilizer; T<sub>3</sub> - 5gm NPK + 30gm bio-fertilizer; T<sub>4</sub> - 5gm NPK + 40gm bio-fertilizer; T<sub>5</sub> - 5gm NPK + 50gm bio-fertilizer; and T<sub>6</sub> -50gm bio-fertilizer alone, were applied on twenty four seedlings of Gal banana variety laid out in a randomized complete block design replicated four times. Growth data was collected on girth of the pseudo-stem, plant height, leaf length and number of suckers per plant at 3, 6 and 9 months after planting. Data on yield components was collected on days to flowering, number of hands per first bunch per stool and weight of the first bunch. Socio-economic analysis established poor husbandry practices, poor soil fertility management practices, low pests and disease management skills, inadequate water utilization and conservation, poor adoption of technologies and poor banana marketing systems as some of the factors associated with the low banana productivity. Soil analysis indicated that soil acidity and low soil fertility are major constraints of banana production in sampled areas. The highest plant growth rate and yields were recorded in treatment T<sub>5</sub> (5gm Multi- K NPK: 13:12:44 + 50gm bio-fertilizer) though it was not significantly different from treatment T<sub>6</sub> (50gm bio-fertilizer alone). This study therefore recommends regular soil analysis to confirm the soil status and integration of 5gm NPK fertilizer with 50gm of Mycorrhizal bio-fertilizer for increased banana productivity in Embu County.

**Keywords:** *banana, production constraints, soil analysis, mycorrhizal-biofertilizer*

## **22. Agronomic performance of selected chickpea varieties in Mbeere, Embu County, Kenya**

**Judith Wafula Katumo**

Chickpea is a legume rich in proteins, improves soil fertility through nitrogen fixation and survives under limited soil moisture. A wide gap exists between the worldwide potential production of 5ton ha<sup>-1</sup> and the the average Kenyan production of 0.3 ton ha<sup>-1</sup>. Human population is rapidly increasing and this necessitates increase in food production through use of optimum plant spacing, selecting chickpea varieties with high genetic potential and through heterosis. Soil fertility level are also changing hence need to determine optimum N and P<sub>2</sub>O<sub>5</sub> application rates. The main aim of the study will be to optimise on agronomic performance of selected chickpea varieties in Mbeere, Embu county, Kenya. An experiment will be carried out at Mbeere, Embu County to determine effect of spacing and N rates on growth, nodulation, yield and protein content of selected chickpea varieties grown in Mbeere. The experiment will be a split split plot arrangement in a randomized complete block design with three replicates over two seasons. Main factors will be spacing in three levels (S1: 50 x 10; S2: 50 x 20 and S3: 50 x 30 cm), followed by N fertilizer rates in four levels of 0-L<sub>0</sub>, 5.4- L<sub>1</sub>, 10.8 L<sub>2</sub>- and 16.2- L<sub>3</sub> kg/ha and P<sub>2</sub>O<sub>5</sub> (0 -L<sub>0</sub>, 13.8- L<sub>1</sub>, 27.6-L<sub>2</sub> and 41.4- L<sub>3</sub>) kg/ha . The four chickpea varieties will form the sub-sub factors and will be assigned to the sub-sub plots. An independent intervarietal hybridisation in three replicates will also be done to determine heterosis levels. All intercultural operations will be done when necessary. Physiological traits will be observed from germination to 50% physiological maturity. The soils shall be tested at beginning and harvest time to note variability during experimentation. Data collected will be subjected to a two-way analysis of variance according to the Generalized Linear Model of statistical analysis System at 5% level of significance. The mean separation will be done using least significant difference test at 95% confidence level using SAS edition 9.2 for study factors. It is anticipated that this study will identify superior chickpea varieties adapted to Kenyan conditions especially Mbeere region and similar ecological zones, provide data on optimal growth conditions and recommend the best varieties under study that farmers and researchers can use to improve the crop's production potential. It will also recommend the best N and P<sub>2</sub>O<sub>5</sub> fertilizer rates and spacing of chickpea for enhanced nodulation and grain protein content.

**Keywords:** *Chickpea, spacing, heterosis, nitrogen levels, Mbeere, Kenya*

### 23. Mycorrhizal fungi associated with *Aspilia pruliseta* on phosphorus availability to sorghum plants

**James Peter Muchoka**

Global reserves of phosphorus (P) are getting depleted and this poses an enormous challenge to food production. Phosphorus is one of the major limiting nutrients for plant productivity. Use of inorganic fertilizers is currently the main way of correcting this situation but is constrained by the high costs of the fertilizer that most farmers cannot afford. Use of plant/mycorrhizal fungi relationship to replenish phosphate is one of the biological techniques being considered. In this study, association of *Aspilia pruliseta* Schweif with mycorrhiza fungi (MF) and their role in enhancing P availability to Gadam sorghum (*Sorghum bicolor* L.) will be investigated. It is hypothesized that co-association of mycorrhizal fungi and *Aspilia pruliseta* enhance availability of phosphate to sorghum. The main objective of this study will be to determine effects of mycorrhiza in the rhizosphere of *Aspilia pruliseta* on phosphorus availability to sorghum crop. Field and green house experiments will be carried out. The green house experiments will be conducted at the University of Embu while field experiments will be done in Tunyai and Gakurungu in Tharaka Nithi county and Karurumo in Embu county. The green house experiments will involve the use of potted plants in the green house with four treatments; *Aspilia pruliseta* vegetation covered soils; soil types; soil depth and mycorrhiza fungi (MF) inoculated gadam sorghum. The treatment combinations will be carried out in a series of four experiments on a randomized complete block design (RCBD) on a split-split model replicated thrice. Data collected will be subjected to analysis of variance (ANOVA). The effects of various treatments given will be compared using multi t-test and any differences between treatments will be examined using least significant difference (LSD) at  $P \leq 0.05$ . The expected outcome of this study will be mass production of MF spores to be used as seed inoculum for the manufacture of inexpensive and sustainable biophosphate fertilizer.

**Keywords:** *mycorrhizal fungi, Aspilia pruliseta, inoculum*



## **UNIVERSITY OF EMBU**

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Enhancing human capacity for societal development.

### **Our Core Values**

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Innovativeness.  
Professionalism.  
Customer focus.  
Teamwork.

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*Knowledge Transforms*

## ANNEX 2: LIST OF PARTICIPANTS

**LIST OF PARTICIPANTS OF FIRST ANNUAL POSTGRADUATE SEMINAR**

	<b>Name of Participant</b>
1.	Prof. Daniel Mugendi Njiru
2.	Prof. Kiplagat Kotut
3.	Prof. Nancy Lukhaji Budambula
4.	Prof. Simon Taaliu Thurania
5.	Dr. John Mbaka Gichimu
6.	Dr. Bernard Mukiri Gichimu
7.	Dr. Boaz Kipyego Too
8.	Dr. Edith Esther Arunga
9.	Dr. Elijah Maina Kimani
10.	Dr. Felix Kipchirchir Ngetich
11.	Dr. Felix Rotich
12.	Dr. Franklin Nyabuto Nyabuga
13.	Dr. Fredrick Mugendi Njoka
14.	Dr. Geoffrey Nkari Gatumo
15.	Dr. George Simba Nyamato
16.	Dr. Jeseo Maina Kinyua
17.	Dr. Josiah Njiru Gitari
18.	Dr. Justine Muhoro Nyaga
19.	Dr. Kiriati
20.	Dr. Mark Otieno
21.	Dr. Millien Kawira Erastus
22.	Dr. Philip Wafula Mayeku
23.	Dr. Phyllis Wambui Muturi
24.	Dr. Reuben Otsyula
25.	Dr. Robert Mathenge Mutwiri

	<b>Name of Participant</b>
26.	Dr. Romano Mwirichia Kachiuru
27.	Dr. Samuel Chege Mwangi
28.	Dr. Samuel Nduati Kariuki
29.	Dr. Simon Muriithi Karuku
30.	Ms. Beatrice Mugambi
31.	Ms. Beatrice Ng'ang'a
32.	Ms. Bridget Wanjiru
33.	Ms. Caroline Koech
34.	Ms. Elizabeth Kishoin
35.	Ms. Elizabeth Njagi
36.	Ms. Eunice Koskei
37.	Ms. Eunice Wangari
38.	Ms. Frida Wanjiku Karani
39.	Ms. Gatumbu Karambu Kiende
40.	Ms. Harriet Karimi
41.	Ms. Hellen Njura
42.	Ms. Irene Mwangi
43.	Ms. Janice Nyaga
44.	Dr. Joanne Atieno Ogunah
45.	Ms. Judith Wafula
46.	Ms. Linda Kaaria
47.	Ms. Maryanne Mucheru
48.	Ms. Miriam Ogake Mochache
49.	Ms. Mirriam Nzivo
50.	Ms. Njenga Veronica Nyokabi

**LIST OF PARTICIPANTS OF FIRST ANNUAL POSTGRADUATE SEMINAR**

	<b>Name of Participant</b>
51.	Ms. Peris Nderitu
52.	Ms. Peter Kinuthia
53.	Ms. Petronilla Serebwa
54.	Ms. Susan Kerubo Onsongo
55.	Ms. Susan Wanjugu Gachora
56.	Ms. Victoria Nyaga
57.	Ms. Wanjira Gitonga
58.	Ms. Ann Kathomi
59.	Ms. Ann Waruita
60.	Mr. Abdi Zeila Dubow
61.	Mr. Abel Nyagemi
62.	Mr. Alex Kipnyargis
63.	Mr. Alex Muriithi
64.	Mr. Alexander Kanyi
65.	Mr. Allan Shivachi
66.	Mr. Anthony Mbatha
67.	Mr. Antony Kimani
68.	Mr. Charles Andrew Onyari
69.	Mr. Daniel Musau Wambua
70.	Mr. Daniel Mutiso Nthiwa
71.	Dr. David Muchangi Mugo
72.	Mr. Elisha Njoka
73.	Mr. Eliud Murimi
74.	Mr. Erick Otieno
75.	Mr. Francis Kaloi

	<b>Name of Participant</b>
76.	Mr. Francis Ngure
77.	Mr. Ileri Muthee
78.	Mr. Isaac Kibet
79.	Mr. James Muchoka
80.	Mr. Jared Anyona Nyakundi
81.	Mr. Jeff Kimanga
82.	Mr. John Githaka
83.	Mr. John Toroitich
84.	Mr. Julius Maore
85.	Mr. Justine Miriti
86.	Mr. Kaburu Ngai
87.	Mr. Kelvin Muchungu
88.	Mr. Kelvin Munene
89.	Mr. Nathan Okoth
90.	Mr. Neliah Moraa
91.	Mr. Paul Waweru Ndungu
92.	Mr. Peterson Mutembe
93.	Mr. Sammy Mwanzia
94.	Mr. Samson Muriithi
95.	Mr. Samuel Gitonga Njeru
96.	Mr. Samuel Njiiri Ndirangu
97.	Mr. Stephen Muia
98.	Mr. Stephen Muteti Mbunzi
99.	Mr. Zephaniah Mbaka