

KENYATTA UNIVERSITY



RESEARCH GRANTS

Project 2010/1				
FUNDING AGENCY	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>			
GRANT NO:	NCST/5/003/3 <sup>RD</sup> CALL PhD/063			
SCHOOL:	<a href="#">APPLIED HUMAN SCIENCES</a>			
DEPARTMENT:	<a href="#">RECREATION MANAGEMENT AND EXERCISE SCIENCE</a>			
PROJECT TITLE	Pulmonary Function of Kenyan Elite Distance Runners at Rest during Sub-Maximal and Maximal Endurance Exercise Performance.			
DURATION	September 2010 to August 2013			
RESEARCH TEAM	<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 33%;">   <b>Researcher:</b>  <a href="#">Francis Mundia Mwangi</a>;                      Kenyatta University                 </td> <td style="width: 33%;">   <b>Supervisor:</b>  <a href="#">Dr. Vincent.O. Onywera</a>;                 </td> <td style="width: 33%;">   <b>Supervisor:</b>  <a href="#">Prof. Mike. Boit</a> </td> </tr> </table>	 <b>Researcher:</b> <a href="#">Francis Mundia Mwangi</a> ; Kenyatta University	 <b>Supervisor:</b> <a href="#">Dr. Vincent.O. Onywera</a> ;	 <b>Supervisor:</b> <a href="#">Prof. Mike. Boit</a>
 <b>Researcher:</b> <a href="#">Francis Mundia Mwangi</a> ; Kenyatta University	 <b>Supervisor:</b> <a href="#">Dr. Vincent.O. Onywera</a> ;	 <b>Supervisor:</b> <a href="#">Prof. Mike. Boit</a>		
BACKGROUND	<p>Kenyan distance runners have dominated international running events for the last four decades. Pulmonary limitations to endurance include exercise-induced arterial hypoxemia, inadequate hyperventilation, excessive widening of the alveolar to arterial oxygen difference and metabolic acidosis. It is not yet known whether Kenyan elite distance runners have an enhanced ability to transfer oxygen from the air to the blood so muscles can use it during sub-maximal and maximal endurance exercise, or the extent to which they experience or overcome these pulmonary limitations to endurance performance. The aim of the study is to assess pulmonary functions parameters of Kenyan elite runners in relation to endurance exercise performance compared with predicted/norm values. This will add to the body of knowledge on Kenyan distance runners and point to whether their pulmonary capacity and functions have bearing on their exemplary performance. The study also will inform pedagogical practices and training methods in the field of exercise and sports science.</p>			
OBJECTIVES:	<ol style="list-style-type: none"> <li>1. To evaluate baseline spirometric values of Kenyan elite middle and long distance runners against norms.</li> <li>2. To evaluate pulmonary (respiratory) values at rest, and during sub maximal and maximal endurance exercise against reference values.</li> <li>3. To find out whether Kenyan elite middle and long distance runners suffer excessive metabolic or respiratory acidosis during sub-maximal and maximal endurance exercises.</li> </ol>			



Project 2011/1

<b>FUNDING AGENCY</b>	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>		
<b>GRANT NO.:</b>	NCST/5/003/3 <sup>RD</sup> CALL PhD/181		
<b>SCHOOL:</b>	<a href="#">HEALTH SCIENCES</a>		
<b>DEPARTMENT:</b>	<a href="#">PAEDIATRIC AND CHILD HEALTH</a>		
<b>PROJECT TITLE</b>	Role of Isoniazid Prophylaxis Therapy (IPT) in Prevention of Tuberculosis in Children under 4years of Age in Household Contact with Adults with Tuberculosis.		
<b>DURATION</b>	November 2011 to December 2013		
<b>RESEARCH TEAM</b>	 <p><b>Researcher:</b> <a href="#">Dr. Florence Nafula Okwara;</a> Kenyatta University</p>	 <p><b>Supervisor:</b> Dr. Oyore John Paul;</p>	 <p><b>Supervisor:</b> Prof. Fred Were</p>
<b>BACKGROUND</b>	<p>Tuberculosis has become an epidemic in this HIV era. Children commonly get infected by adults with TB living in their households. Children under 4years of age often suffer severe forms of TB following infection, and hence poorer outcomes. Isoniazide prophylaxis therapy (IPT) offers a chance of exposed children from getting infected. This is a multicenter longitudinal cohort study evaluating the role of IPT in preventing TB in children in households contact with adults with TB. The study is being done in 3informal settlements in Nairobi namely; Kayole Sub-District hospital, Dandora Health center and Medical Missionary of Mary health center, Mukuru. Convenience sampling of recently diagnosed adults with smear positive TB attending the TB clinics is done and subjects are asked to bring any children under 4years living in their households to the child TB contacts' clinic. A structured questionnaire is used to obtain data on their TB diagnosis and treatment, sociodemographic, economic, cultural and environmental characteristics. The child contacts' undergo a clinical evaluation and nutrition status assessment. A blood and sputum sample where possible is obtained at baseline for liver enzymes, PCR for HIV RNA and for smear microscopy for Acid Alcohol fast Bacilli (Aafb) respectively. Contacts above 3minths also undergo Tuberculin Skin Test at onset. They are then put on isoniazide at 10mg/kg for 6months. Contacts are to be followed up for 1year, where once every 2months, they undergo a clinical assessment and tests include liver enzymes, sputum smears if coughing and compliance monitoring. Any children requiring more specialized tests are referred to Mbagathi District Hospital.</p>		
<b>OBJECTIVES:</b>	1. Determine the rate of TB infection and disease among children in household		

with adult with TB.

2. To investigate the effect of IPT on incidence of active TB in HIV-infected children, in children in household contacts with TB infected adults.
3. To establish the acceptance and compliance of contact screening and UP for child household contacts with adults with TB in high burden settings.
4. To describe the toxicities associated with IPT in high burden settings.
5. To determine IPT failure rate and the predisposing factors thereof.

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RESEARCH GRANTS

<b>Project 20111/2</b>				
<b>FUNDING AGENCY</b>	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>			
<b>GRANT NO.:</b>	NCST/5/003/065			
<b>SCHOOL:</b>	<a href="#">PUBLIC HEALTH</a>			
<b>DEPARTMENT:</b>	<a href="#">COMMUNITY HEALTH</a>			
<b>PROJECT TITLE</b>	HIV/Pulmonary TB Co-Infection amongst Intravenous Drug Users in Mombasa County, Kenya.			
<b>DURATION</b>	November 2011 to November 2014			
<b>RESEARCH TEAM</b>	<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 33%; vertical-align: middle;">   <b>Researcher:</b> Valentine Budambula                 </td> <td style="width: 33%; vertical-align: middle;">   <b>Supervisor:</b> <a href="#">Dr. Michael Otieno;</a> Kenyatta University                 </td> <td style="width: 33%; vertical-align: middle;">   <b>Supervisor:</b> <a href="#">Dr. Tom Were</a> </td> </tr> </table>	 <b>Researcher:</b> Valentine Budambula	 <b>Supervisor:</b> <a href="#">Dr. Michael Otieno;</a> Kenyatta University	 <b>Supervisor:</b> <a href="#">Dr. Tom Were</a>
 <b>Researcher:</b> Valentine Budambula	 <b>Supervisor:</b> <a href="#">Dr. Michael Otieno;</a> Kenyatta University	 <b>Supervisor:</b> <a href="#">Dr. Tom Were</a>		
<b>BACKGROUND</b>	Intravenous drug use (IDU) has been perceived as a European or Asian issue. However, a comprehensive review of literature indicates that drug use is increasing on the African continent, especially in the coastal cities of Eastern Africa such as Mombasa. Since, the HIV/AIDS epidemic began, drug users have been one of the most affected groups. IDU fuels the spread of HIV among affected populations through sharing syringes and needles, sexual as well as vertical transmission. IDUs are more vulnerable to malnutrition, poverty and overcrowding, which are known risk factors for both HIV/AIDS and tuberculosis (TB) infections. Moreover, people living with HIV/AIDS are fifty times more likely to develop active TB than HIV sero-negative people. Furthermore, TB infection accelerates the progression of HIV to AIDS. HIV/AIDS and TB are co-endemic in Sub-Saharan Africa.			
<b>OBJECTIVES:</b>	This study seeks to describe the social economic trends of IDUs and their nutritional status as well as to elucidate the antimicrobial sensitivity patterns of the mycobacterium isolates among IDUs. In addition the study will employ descriptive cross-sectional methods to determine the prevalence and factors associated with HIV/Pulmonary TB co- infections.			



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RESEARCH GRANTS

Project 2011/3					
FUNDING AGENCY	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>				
GRANT NO.:	NCST/5/003/2 <sup>ND</sup> CALL PhD/36				
SCHOOL:	<a href="#">PUBLIC HEALTH</a>				
DEPARTMENT:	<a href="#">COMMUNITY HEALTH</a>				
PROJECT TITLE	The Effects of Crystalloid Solution on the Human Coagulation System.				
DURATION	January 2011 to December 2013				
RESEARCH TEAM	<table border="1"> <tr> <td>  <p><b>Researcher:</b> <a href="#">Dr. Gordon Oluoch Ogweno</a>; Kenyatta University</p> </td> <td>  <p><b>Supervisor:</b> Prof. Walter Mwanda.</p> </td> <td>  <p><b>Supervisor:</b> <a href="#">Prof. Nicholas Kamindu Gikonyo</a>; Kenyatta University</p> </td> <td>  <p><b>Supervisor:</b> Dr. Fred Bukachi;</p> </td> </tr> </table>	 <p><b>Researcher:</b> <a href="#">Dr. Gordon Oluoch Ogweno</a>; Kenyatta University</p>	 <p><b>Supervisor:</b> Prof. Walter Mwanda.</p>	 <p><b>Supervisor:</b> <a href="#">Prof. Nicholas Kamindu Gikonyo</a>; Kenyatta University</p>	 <p><b>Supervisor:</b> Dr. Fred Bukachi;</p>
 <p><b>Researcher:</b> <a href="#">Dr. Gordon Oluoch Ogweno</a>; Kenyatta University</p>	 <p><b>Supervisor:</b> Prof. Walter Mwanda.</p>	 <p><b>Supervisor:</b> <a href="#">Prof. Nicholas Kamindu Gikonyo</a>; Kenyatta University</p>	 <p><b>Supervisor:</b> Dr. Fred Bukachi;</p>		
BACKGROUND	<p>Crystalloid solutions are popular for volume resuscitation following blood loss associated with surgery and accidental trauma. The development of impairment of blood clot formation with consequent increased bleeding, commonly attributed to dilution of clotting factors is the greatest limitation to their use. While its being acknowledged that fluid infusion inevitably dilute clotting factors, emerging evidence is beginning to reveal the administration of plasma clotting factor concentrates does not normalize the 'dilutional coagulopathy'. One clear knowledge gap is the influence of crystalloid induced plasma dilution on blood clotting separate from confounding factors associated with tissue trauma as may be found during trauma and surgery and its clinical management based on the current prevailing information. The broad, long term aim of this study is to establish the potential correlational relationship between crystalloid formulation, plasma electrolyte imbalances to coagulation defects, <i>in vitro</i> and <i>ex vivo</i>. This will help bridge the gap in the peri-operative fluid management in the resource-limited settings, where fluid resuscitations often in development of coagulopathy and blood products administrated to correct the condition achieve variable results. This is even more pertinent in countries with limited supply of blood products is compounded by high HIV prevalence.</p>				
OBJECTIVES:	<ol style="list-style-type: none"> <li>1. To determine the effects of crystalloids solutions on the human blood clotting under varying conditions of solute content and concentration using routine coagulation tests.</li> <li>2. To evaluate the effects of crystalloid solutions on clot strength and fibrinolysis using thrombelastography.</li> <li>3. To determine the influence of various crystalloids on blood clot morphology as a function of concentration and dilution.</li> </ol>				

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|  | <ol style="list-style-type: none"><li>4. To determine the correlates of plasma electrolyte changes with blood clotting time, clot strength and lot morphology.</li><li>5. To determine the influence crystalloid concentration and solute type on thrombin generation.</li><li>6. To determine the effects of crystalloid solutions on platelet functions.</li></ol> |
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<b>Project 2012/1</b>					
<b>FUNDING AGENCY</b>	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>				
<b>GRANT NO.:</b>	NCST/5/003/3 <sup>rd</sup> CALL PhD/146				
<b>SCHOOL:</b>	<a href="#">PURE AND APPLIED SCIENCES</a>				
<b>DEPARTMENT:</b>	<a href="#">CHEMISTRY</a>				
<b>PROJECT TITLE</b>	Chemical Analysis and Concentration of Iron in Laterites from Kamahuha in Murang'a, Kenya to Assess Deposits with Economic Value				
<b>DURATION</b>	February 2012 to February 2014				
<b>RESEARCH TEAM</b>	<table border="1"> <tr> <td style="text-align: center;">   <b>Researcher:</b>            Peter W. Njoroge         </td> <td style="text-align: center;">   <b>Supervisor:</b>  <a href="#">Prof. Naftali T. Mureithi;</a>            Kenyatta University         </td> <td style="text-align: center;">   <b>Supervisor:</b>  <a href="#">Dr. Jackson W. Muthengia;</a>            Kenyatta University         </td> <td style="text-align: center;">   <b>Supervisor:</b>  <a href="#">Dr. Ruth Wanjau;</a>            Kenyatta University         </td> </tr> </table>	 <b>Researcher:</b> Peter W. Njoroge	 <b>Supervisor:</b> <a href="#">Prof. Naftali T. Mureithi;</a> Kenyatta University	 <b>Supervisor:</b> <a href="#">Dr. Jackson W. Muthengia;</a> Kenyatta University	 <b>Supervisor:</b> <a href="#">Dr. Ruth Wanjau;</a> Kenyatta University
 <b>Researcher:</b> Peter W. Njoroge	 <b>Supervisor:</b> <a href="#">Prof. Naftali T. Mureithi;</a> Kenyatta University	 <b>Supervisor:</b> <a href="#">Dr. Jackson W. Muthengia;</a> Kenyatta University	 <b>Supervisor:</b> <a href="#">Dr. Ruth Wanjau;</a> Kenyatta University		
<b>BACKGROUND</b>	<p>The main raw material for iron and steel is iron ore. There are occurrences of this mineral in Kenya, which have not been fully evaluated for economic exploitation. The iron and steel industry formed 13% of the manufacturing sector, which in turn contributed around 13% of the GDP in Kenya in 2009. Local deposits of iron ore and laterites containing iron have been identified in several locations and have attracted commercial interests but no extraction is taking place in the country. Laterites containing high levels of iron are widely spread throughout the country and offer an alternative source of iron. This study aims at beneficiating iron minerals from Murang'a region. The study will involve collecting laterites from Kamahuha in Murang'a Kenya. Nature of the minerals will be determined using X-ray diffraction. Total elemental analysis will be determined using Atomic Absorption Spectroscopy (AAS), X-ray Fluorescence Spectroscopy (XFRS) and titrimetric analysis using EDTA. Iron beneficiation will be done on finely ground laterites by roasting with charcoal in a kiln and try to convert the hematite and goethite to magnetite. The concentrated laterites will then be reduced to recover the iron metal.</p>				
<b>OBJECTIVES:</b>	To analyze and concentrate iron in laterites from selected sites in Kamahuha, Kenya for economic extraction of iron.				



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Project 2012/2				
FUNDING AGENCY	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>			
GRANT NO.:	NCST/5/003/3 <sup>RD</sup> CALL MSc/035			
SCHOOL:	<a href="#">PURE AND APPLIED SCIENCES</a>			
DEPARTMENT:	<a href="#">CHEMISTRY</a>			
PROJECT TITLE	Determination of Selected Essential Minerals in Some Indigenous Leafy Green Vegetables and Soils O Which They Grow In Nyeri, Kenya.			
DURATION	February 2012 to February 2014			
RESEARCH TEAM	<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 33%; vertical-align: top;">  <p><b>Researcher:</b> James Kanyoko Waweru</p> </td> <td style="width: 33%; vertical-align: top;">  <p><b>Supervisor:</b> <a href="#">Prof Jane Igoki Murungi</a>; Kenyatta University.</p> </td> <td style="width: 33%; vertical-align: top;">  <p><b>Supervisor:</b> <a href="#">Dr. Ruth Wanjau</a>; Kenyatta University</p> </td> </tr> </table>	 <p><b>Researcher:</b> James Kanyoko Waweru</p>	 <p><b>Supervisor:</b> <a href="#">Prof Jane Igoki Murungi</a>; Kenyatta University.</p>	 <p><b>Supervisor:</b> <a href="#">Dr. Ruth Wanjau</a>; Kenyatta University</p>
 <p><b>Researcher:</b> James Kanyoko Waweru</p>	 <p><b>Supervisor:</b> <a href="#">Prof Jane Igoki Murungi</a>; Kenyatta University.</p>	 <p><b>Supervisor:</b> <a href="#">Dr. Ruth Wanjau</a>; Kenyatta University</p>		
BACKGROUND	<p>Indigenous leafy green vegetables are an important constituent in the diet of many Kenyans. Some of the indigenous leafy green vegetables commonly found in Nyeri includes: togotia (<i>Erucastrum arabicum</i>), tatha (<i>Urtica massaica</i>), terere (<i>Amaranthus hybridus I</i>), managu (<i>solanum nigrum</i>), muhika na ihu (<i>Asystasia mysorensis</i>), among others. Indigenous leafy green vegetables are valuable sources of nutrients especially in rural areas where they contribute substantially to protein, minerals, vitamins, fiber and other nutrients which are usually in short supply in daily diet. The essential minerals supplied by these indigenous leafy green vegetables are important in human nutrition for example boron reduces risk of cancer and osteoporosis, copper and iron are needed to make adenosine triphosphate (ATP) , synthesize of some hormones and blood cells. Their deficiency leads to fatigue. Chromium maintains normal blood sugar level and helps increase cholesterol in blood, while manganese is needed for healthy skin, bone, cartilage and forms part of the antioxidants. Zinc has ability to repair wound, maintain fertility, synthesis protein, cell reproduction, maintain eyesight, act as an antioxidant and boost immunity besides preventing disease. However the levels of these essential elements may be affected by their levels in the soils. Despite large amounts of information on exotic vegetables very few reports are available on the levels of essential minerals in indigenous leafy vegetables from Nyeri and the soils on which they grow. There is need therefore to determine their levels. This study proposes to analyze the levels of Ca, Fe, K, Na, Zn, V, Co, Cr, Mo, Si, Mg, Mn and B in indigenous leafy vegetables and in the soils on which they grow.</p>			

<b>OBJECTIVES:</b>	<ol style="list-style-type: none"><li data-bbox="448 239 1449 300">1. To determine the levels of selected essential minerals in some indigenous leafy vegetables and in the soils on which they grow from Nyeri.</li><li data-bbox="448 338 1501 472">2. To determine the levels of essential elements Ca, Fe, K, Na, Zn, V, Co, Cr, Cu, Mn, Mg in leaves of <i>Erucastrum arabicum</i>, <i>Urtica massaica</i>, <i>Amaranthus hybridus L</i>, <i>Solanum nigrum</i>, <i>Asystasia mysorensis</i> from Othaya, Kieni, Nyeri Town, Mukurweini and Tetu using AAS.</li><li data-bbox="448 510 1469 611">3. To determine the levels of Ca, Fe, K, Na, Zn, V, Co, Cr, Cu, Mn, Mg in soils where <i>Erucastrum arabicum</i>, <i>Urtica massaica</i>, <i>Amaranthus hybridus L</i>, <i>Solanum nigrum</i>, <i>Asystasia mysorensis</i> grow.</li></ol>



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Project : 2011/4				
FUNDING AGENCY	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>			
GRANT NO.:	NCST/5/003/3 <sup>RD</sup> MSc/104			
SCHOOL:	<a href="#">PURE AND APPLIED SCIENCES</a>			
DEPARTMENT:	<a href="#">CHEMISTRY</a>			
PROJECT TITLE	Quantification of Lycopene, B-Cryptoxanthin and B-Carotene in Different Varieties of Mangoes in Machakos County			
DURATION	March 2011 to December 2012			
RESEARCH TEAM	<table border="1"><tr><td><p><b>Researcher:</b> David Muli Musyoki</p></td><td><p><b>Supervisor:</b> <a href="#">Prof. Ahmed Hassan Ali</a>; Kenyatta University</p></td><td><p><b>Supervisor:</b> <a href="#">Dr. Sauda Swaleh</a>; Kenyatta University</p></td></tr></table>	 <p><b>Researcher:</b> David Muli Musyoki</p>	 <p><b>Supervisor:</b> <a href="#">Prof. Ahmed Hassan Ali</a>; Kenyatta University</p>	 <p><b>Supervisor:</b> <a href="#">Dr. Sauda Swaleh</a>; Kenyatta University</p>
 <p><b>Researcher:</b> David Muli Musyoki</p>	 <p><b>Supervisor:</b> <a href="#">Prof. Ahmed Hassan Ali</a>; Kenyatta University</p>	 <p><b>Supervisor:</b> <a href="#">Dr. Sauda Swaleh</a>; Kenyatta University</p>		
BACKGROUND	The study was carried out to determine the levels of $\beta$ -carotene, $\beta$ - Cryptoxanthin and lycopene in different varieties of mangoes in the two districts and to establish any natural variations in the levels of these antioxidants. In addition, the study was to compare the level of lycopene and $\beta$ - Cryptoxanthin at different stages of the fruit ripening process. The compounds were to be analyzed using a reversed phase isocratic non-aqueous HPLC with diode array detector. The study was expected to provide nutrition composition data which may offer some guide on the best source of antioxidants and any variations that may be associated with ripening.			
OBJECTIVES:	To quantify the levels of $\beta$ -carotene, $\beta$ - Cryptoxanthin and lycopene in the five varieties of mangoes in selected parts of Mwala and Machakos District at two different stages of ripening.			



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Project: 2010/3			
FUNDING AGENCY	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>		
GRANT NO.:			
SCHOOL:	<a href="#">PURE AND APPLIED SCIENCES</a>		
DEPARTMENT:	<a href="#">PHYSICS</a>		
PROJECT TITLE	In <sub>x</sub> Se <sub>y</sub> Thin Films for Phase Random Access (PRAM) Memory Applications		
DURATION	September 2010 to November 2011		
RESEARCH TEAM	<table border="1"><tr><td><p><b>Researcher:</b> Wekunda B. Z. Buya</p></td><td><p><b>Supervisor:</b> <a href="#">Dr. Patrick M. Karimi</a>; Kenyatta University.</p></td></tr></table>	 <p><b>Researcher:</b> Wekunda B. Z. Buya</p>	 <p><b>Supervisor:</b> <a href="#">Dr. Patrick M. Karimi</a>; Kenyatta University.</p>
 <p><b>Researcher:</b> Wekunda B. Z. Buya</p>	 <p><b>Supervisor:</b> <a href="#">Dr. Patrick M. Karimi</a>; Kenyatta University.</p>		
BACKGROUND	This research work involved establishing the link between the Indium to Selenium ratio and its effect on the sheet resistivity of the thin films prepared from this compound. The resistivity of a material is an important parameter in memory fabrication. After optimizing the film samples, a memory cell is to be fabricated and characterized to establish its functionality.		
OBJECTIVES:	<ol style="list-style-type: none"><li>1. To synthesize indium and selenium compound into different ratios by molar mass.</li><li>2. To prepare thin films from the samples of the indium and selenium compound.</li><li>3. To study the optical characteristics of the thin films.</li><li>4. To study the electrical characteristics of the thin films.</li><li>5. To optimize the films, fabricate a memory cell and characterize it.</li></ol>		



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<b>Project : 2012/3</b>				
<b>FUNDING AGENCY</b>	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>			
<b>GRANT NO.:</b>	NCST/5/003/3 <sup>rd</sup> CALL MSc/116			
<b>SCHOOL:</b>	<a href="#">PURE AND APPLIED SCIENCES</a>			
<b>DEPARTMENT:</b>	<a href="#">PHYSICS</a>			
<b>PROJECT TITLE</b>	Measurement and Multivariate Chemometric Analysis of Radon Concentration in the Geothermal Fluids Associated with the High Background Radiation Area (HBRA).			
<b>DURATION</b>	February to August 2012			
<b>RESEARCH TEAM</b>	<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 33%; vertical-align: top;">   <b>Researcher:</b>            Geoffrey N. Mayaka         </td> <td style="width: 33%; vertical-align: top;">   <b>Supervisor:</b>  <a href="#">Dr. N.O Hashim;</a>            Kenyatta University         </td> <td style="width: 33%; vertical-align: top;">   <b>Supervisor:</b>            Dr. H.K. Angenyo         </td> </tr> </table>	 <b>Researcher:</b> Geoffrey N. Mayaka	 <b>Supervisor:</b> <a href="#">Dr. N.O Hashim;</a> Kenyatta University	 <b>Supervisor:</b> Dr. H.K. Angenyo
 <b>Researcher:</b> Geoffrey N. Mayaka	 <b>Supervisor:</b> <a href="#">Dr. N.O Hashim;</a> Kenyatta University	 <b>Supervisor:</b> Dr. H.K. Angenyo		
<b>BACKGROUND</b>	Information and models for the geothermally active high background radiation areas diagnostics based on radon signature hardly exists in many parts of the world including Kenya because more attention has been given to the health hazards caused by radon. This research will provide information which will improve the understanding of underlying patterns, relationship and explanatory trends of radon signatures in a typical high background radiation area geothermal field.			
<b>OBJECTIVES:</b>	The main goal of this work is to measure radon concentration in geothermal fluids associated with high background radiation areas using liquid scintillation spectrometry and to perform multivariate chemometric analysis on the data in order to understand underlying patterns, relationships and explanatory trends of radon in relation to geothermal potential.			



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<b>Project :2009/1</b>			
<b>FUNDING AGENCY</b>	<a href="#"><u>NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</u></a>		
<b>GRANT NO.:</b>	<b>NCST/5/003/PG/114</b>		
<b>SCHOOL:</b>	<a href="#"><u>PURE AND APPLIED SCIENCES</u></a>		
<b>DEPARTMENT:</b>	<a href="#"><u>PHYSICS</u></a>		
<b>PROJECT TITLE</b>	Development of an Improved Fluid Bed Dryer.		
<b>DURATION</b>	January 2009 to September 2012		
<b>RESEARCH TEAM</b>	<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 50%; vertical-align: middle;">   <b>Researcher:</b>            Nickson Kipng'etich Langat         </td> <td style="width: 50%; vertical-align: middle;">   <b>Supervisor:</b>            Prof. Thomas N. Thoruwa         </td> </tr> </table>	 <b>Researcher:</b> Nickson Kipng'etich Langat	 <b>Supervisor:</b> Prof. Thomas N. Thoruwa
 <b>Researcher:</b> Nickson Kipng'etich Langat	 <b>Supervisor:</b> Prof. Thomas N. Thoruwa		
<b>BACKGROUND</b>	<p>Tea is Kenya's largest foreign currency earner. More than four million of Kenya's people are directly or indirectly involved in the industry. According to International Tea Committee, in 2010 a total of 399,006 metric tons of tea were produced in Kenya and 441,021 metric tons were exported to other countries while the remaining quantity were consumed locally. More than 95% and less than 5% of the annual tea production accounts for black tea and green tea respectively. Green tea is made from the top two leaves and buds of a shrub, <i>Camellia sinensis</i>, of the family Theaceae and the order Theales. Green tea leaves are picked and immediately sent to be dried or steamed to prevent fermentation. Besides distinction of varieties of tea, the major difference between the types of tea is the processing method. Despite the large scale production of tea in Kenya, farmers have limited access to green tea processing technologies due to lack of knowledge and high cost of green tea processing. Drying is a key process which determines the physical and chemical characteristics of green tea, such as color and aroma as well as catechin and caffeine content. The key objective of mounting this project is to develop an improved drying system for green tea drying in Kenya. The importance of the proposed project is to establish a cheap and easily adaptable drying technology which can be utilized by small scale tea farmers to process green tea into beverage and medicinal product. This technology when fully utilized will economically empower tea farmers through establishment of small enterprises, factories and societies. Implementation of the project shall be carried out in three phases: laboratory, prototype development and data collection and results utilization</p>		
<b>OBJECTIVES:</b>	<ol style="list-style-type: none"> <li>1. Development of an improved prototype dryer.</li> <li>2. Economic analysis and applicability of prototype dryer.</li> </ol>		



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RESEARCH GRANTS

<b>Project :</b> 2011/5			
<b>FUNDING AGENCY</b>	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>		
<b>GRANT NO.:</b>	NCST/5/003/2 <sup>nd</sup> CALL MSc/48		
<b>SCHOOL:</b>	<a href="#">ENVIRONMENTAL STUDIES</a>		
<b>DEPARTMENT:</b>	<a href="#">ENVIRONMENTAL EDUCATION</a>		
<b>PROJECT TITLE</b>	The Role of Environmental Conservation on Survival of Indigenous Medicinal Knowledge, Meru County, Kenya		
<b>DURATION</b>	February 2011 to August 2012		
<b>RESEARCH TEAM</b>	 <p><b>Researcher:</b> Antonina G. Mugambi</p>	 <p><b>Supervisor:</b> Prof. Paul Kamau Mbugua</p>	 <p><b>Supervisor:</b> <a href="#">Dr. Fuchaka. Waswa.</a> Kenyatta University</p>
<b>BACKGROUND</b>	This research work involved establishing the role played by environmental conservation in survival of indigenous medicinal knowledge in Imenti South District, Meru County Kenya. Because indigenous medicinal materials connect to the three basic human interest i.e. health, income and cultural identity, this could present potentially powerful motivation forces for environmental conservation. Indigenous medicinal practices involve use of materials that are almost entirely collected from the wild, thus strategies to protect the wild are very vital if this knowledge will survive and grow.		



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RESEARCH GRANTS

<b>Project : 2012/4</b>					
<b>FUNDING AGENCY</b>	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>				
<b>GRANT NO.:</b>	NCST/5/003/3 <sup>RD</sup> CALL PHD				
<b>SCHOOL:</b>	<a href="#">ENVIRONMENTAL STUDIES</a>				
<b>DEPARTMENT:</b>	<a href="#">ENVIRONMENTAL EDUCATION</a>				
<b>PROJECT TITLE</b>	Status and Effects of Indigenous Vegetables on Agrobiodiversity and Community Livelihood in Mumias Sugar Belt, Kenya.				
<b>DURATION</b>	January 2012 to December 2014				
<b>RESEARCH TEAM</b>	<table border="1"> <tr> <td>  <p><b>Researcher:</b> <a href="#">Evelyne Chitechi Wemali</a>; Kenyatta University</p> </td> <td>  <p><b>Supervisor:</b> <a href="#">Prof. Michael K. Koech</a>; Kenyatta University</p> </td> <td>  <p><b>Supervisor:</b> <a href="#">Dr. Judy Kariuki</a>; Kenyatta University</p> </td> <td>  <p><b>Supervisor:</b> Dr. James N. Maraga</p> </td> </tr> </table>	 <p><b>Researcher:</b> <a href="#">Evelyne Chitechi Wemali</a>; Kenyatta University</p>	 <p><b>Supervisor:</b> <a href="#">Prof. Michael K. Koech</a>; Kenyatta University</p>	 <p><b>Supervisor:</b> <a href="#">Dr. Judy Kariuki</a>; Kenyatta University</p>	 <p><b>Supervisor:</b> Dr. James N. Maraga</p>
 <p><b>Researcher:</b> <a href="#">Evelyne Chitechi Wemali</a>; Kenyatta University</p>	 <p><b>Supervisor:</b> <a href="#">Prof. Michael K. Koech</a>; Kenyatta University</p>	 <p><b>Supervisor:</b> <a href="#">Dr. Judy Kariuki</a>; Kenyatta University</p>	 <p><b>Supervisor:</b> Dr. James N. Maraga</p>		
<b>BACKGROUND</b>	Sugar cane growing is an important cash crop in Mumias District. Studies show that the average acreage of traditional food crops, indigenous vegetables includes is on the decline in Mumias. Although intercropping of indigenous food crop with sugar cane is practiced by many households, indigenous crops cultivation continues to dwindle. The decline could be attributed to the value attached to sugarcane as a value cash crop compared to food crops. This decline if left unabated, could lead to loss of genetic and species diversity resulting to loss of crops that are adapted to the environmental stress of the region such as indigenous vegetables. Loss of these indigenous crops will not only undermine food security but also interfere with environmental resilience and general livelihoods of the local communities.				
<b>OBJECTIVES:</b>	The main objective of the study is to explore the status and effects of indigenous vegetables on agrobiodiversity and community livelihood in a predominantly sugarcane growing area.				



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RESEARCH GRANTS

<b>Project : 2010/4</b>				
<b>FUNDING AGENCY</b>	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>			
<b>GRANT NO.:</b>	NCST/5/003/3 <sup>RD</sup> CALL PhD/003			
<b>SCHOOL:</b>	<a href="#">ENVIRONMENTAL STUDIES</a>			
<b>DEPARTMENT:</b>	<a href="#">ENVIRONMENTAL EDUCATION</a>			
<b>PROJECT TITLE</b>	Potential of Biogas Technology for Climate Change Mitigation and For Improving Livelihoods of Smallholder Farmers in Kiambu County			
<b>DURATION</b>	May 2010 to April 2013			
<b>RESEARCH TEAM</b>	<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 33%; vertical-align: top;">   <b>Researcher:</b>  <a href="#">Salome Wamuyu Muriuki</a>;            Kenyatta University         </td> <td style="width: 33%; vertical-align: top;">   <b>Supervisor:</b>  <a href="#">Prof. James B. Kungu</a>;            Kenyatta University         </td> <td style="width: 33%; vertical-align: top;">   <b>Supervisor:</b>            Dr. Alex K. Machocho         </td> </tr> </table>	 <b>Researcher:</b> <a href="#">Salome Wamuyu Muriuki</a> ; Kenyatta University	 <b>Supervisor:</b> <a href="#">Prof. James B. Kungu</a> ; Kenyatta University	 <b>Supervisor:</b> Dr. Alex K. Machocho
 <b>Researcher:</b> <a href="#">Salome Wamuyu Muriuki</a> ; Kenyatta University	 <b>Supervisor:</b> <a href="#">Prof. James B. Kungu</a> ; Kenyatta University	 <b>Supervisor:</b> Dr. Alex K. Machocho		
<b>BACKGROUND</b>	<p>Energy is one of the basic inputs for all economic activities and sustainable development. With an estimated 80% of Kenya population living in the rural areas, access to reliable and affordable energy supply is severely constrained. Modern cooking fuels such as electricity and liquefied petroleum gas are expensive, and only at the reach of rich Kenyans, Making more than 90% of the rural people to rely primarily on wood fuel to meet their cooking and heating energy needs. In the greater rural Kiambu County, continued overdependence on firewood as the primary source of household energy, has contributed to uncontrolled harvesting of trees, leading to destruction of carbon sinks, loss of ecosystem values and functions and increased concentration of CO<sub>2</sub> in the troposphere. Besides, continued consumption of firewood has contributed to indoor air pollution and increase in respiratory ailments among users in the area. The government and several other development organizations have over last the few decades introduced biogas energy in the area, to provide affordable, clean and sustainable domestic energy to the residents. Nonetheless, only a small proportion of the community has adopted the technology. It is not clear what factors motivate some households to adopt the technology while many others do not adopt. The proposed study is motivated by the need to understand the promise of biogas technology in improving livelihoods and safeguarding the environment in Kiambu. The overall objective is to assess the role of biogas energy technology as a tool for saving wood, mitigating greenhouse gases emission, and improving the livelihoods of rural communities in Kiambu. The study will be conducted in the greater Kiambu County and will specifically target households. Participatory experimental research on biogas technology and field surveys will be employed.</p>			



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RESEARCH GRANTS

Project : 2012/5				
FUNDING AGENCY	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>			
GRANT NO.:				
SCHOOL:	<a href="#">APPLIED HUMAN SCEINCES</a>			
DEPARTMENT:	<a href="#">FOOD, NUTRITION AND DIETETICS</a>			
PROJECT TITLE	Promoting Optimal Infant Feeding Through 'Couple Counseling': A Randomized Controlled Trial in Nyando District Kenya			
DURATION	March 2012 to February 2014			
RESEARCH TEAM	<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 33%;">  <p><b>Researcher:</b> <a href="#">Irene Awour Ogada</a>; Kenyatta University</p> </td> <td style="width: 33%;">  <p><b>Supervisor:</b> Prof. Rosebella Onyango;</p> </td> <td style="width: 33%;">  <p><b>Supervisor:</b> Florence Akeyo</p> </td> </tr> </table>	 <p><b>Researcher:</b> <a href="#">Irene Awour Ogada</a>; Kenyatta University</p>	 <p><b>Supervisor:</b> Prof. Rosebella Onyango;</p>	 <p><b>Supervisor:</b> Florence Akeyo</p>
 <p><b>Researcher:</b> <a href="#">Irene Awour Ogada</a>; Kenyatta University</p>	 <p><b>Supervisor:</b> Prof. Rosebella Onyango;</p>	 <p><b>Supervisor:</b> Florence Akeyo</p>		
BACKGROUND	<p>Optimal infant and young child feeding (IYCF) is important in achieving good health, development and survival. The role of a baby's father has been identified as one of the strongest influences on infant feeding. Several infant feeding support and promotion avenues have been created for mothers. However, few have targeted fathers. Moreover, those interventions targeting fathers have mainly been in developed countries. There is scarce information on effectiveness of infant feeding interventions targeting fathers in Sub-Saharan Africa, and on interventions targeting couples. Maternal counseling has been demonstrated to be effective.</p> <p>The purpose of this study is to assess the effectiveness of "couple counseling" in promoting optimal infant feeding. It will answer the question- does including fathers in infant feeding counseling lead to better infant feeding outcomes. This study comes at a time when reducing child malnutrition and mortality is central in the global agenda. It is consistent with the objectives of both national and global initiatives and strategies related to IYCF like Millennium Development Goal 4 (reducing child mortality) and the social strategy of the Kenya Vision 2030. The information generated by this study will therefore be useful to the Ministry of Public Health and sanitation and other stakeholders concerned with the health of children. The study will contribute to the knowledge base that currently exists on the potential of harnessing paternal participation in IYCF. By substantiating assertions that improving paternal support improves infant feeding practices, it is anticipated that the study will provide impetus to the mainstreaming of paternal participation in IYCF issues. This would for instance lead to re-designing of current counseling strategies to actively include fathers. A significant output of the study is an "IYCF couple counseling guide".</p>			



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RESEARCH GRANTS

<b>Project :</b>			
<b>FUNDING AGENCY</b>	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>		
<b>GRANT NO.:</b>	NCST/5/003/3 <sup>rd</sup> ST&I CALL/239		
<b>SCHOOL:</b>	<a href="#">PURE AND APPLIED SCIENCES</a>		
<b>DEPARTMENT:</b>	<a href="#">ZOOLOGICAL SCIENCES</a>		
<b>PROJECT TITLE</b>	Improving Food Security and Human Health through Integration of Livestock, Medicinal Plants and Water Management to Combat Mosquito Vector in Ahero Rice Paddies.		
<b>DURATION</b>			
<b>RESEARCH TEAM</b>	<table border="1"><tr><td><p><b>Researcher:</b> <a href="#">Prof. Elizabeth Kokwaro;</a> Kenyatta University</p></td><td><p><b>Supervisor:</b> <a href="#">Dr. Michael M. Gicheru.;</a> Kenyatta University</p></td></tr></table>	 <p><b>Researcher:</b> <a href="#">Prof. Elizabeth Kokwaro;</a> Kenyatta University</p>	 <p><b>Supervisor:</b> <a href="#">Dr. Michael M. Gicheru.;</a> Kenyatta University</p>
 <p><b>Researcher:</b> <a href="#">Prof. Elizabeth Kokwaro;</a> Kenyatta University</p>	 <p><b>Supervisor:</b> <a href="#">Dr. Michael M. Gicheru.;</a> Kenyatta University</p>		
<b>BACKGROUND</b>	<p>This project seeks to address food security and human health problems in Ahero, Nyando District. Rice production in Ahero employs full flooding during the various stages of development. It also directly uses inorganic fertilizers and pesticides to provide adequate yield and control pests and vectors in rice paddies. This contributes to increased mosquito breeding, malaria transmission and food insecurity. Increase in mosquito population with irrigation as a major ecological challenge in the sense that it adds to the complexity of the task of maintaining adequate rice production, human and environmental health with regard to rice field management. This puts at risk the livelihoods of communities and other stakeholders in Ahero rice Irrigation scheme. Furthermore, costs of inorganic fertilizers and other agricultural inputs have resulted in rice farmers either applying minimal quantities and or leaving land fallow during off season resulting to low food production</p>		
<b>OBJECTIVES</b>	<ol style="list-style-type: none"><li>1. To build capacity of rice farmers to adopt integration technologies of cow dung, intermittent irrigation and <i>Artemesia annua</i> in Ahero.</li><li>2. Visiting <i>Artemesia</i> processing factories to establish potential market for Ahero farmers.</li><li>3. To train farmers on monitoring of mosquitoes at Ahero rice paddies.</li><li>4. Dissemination of research findings</li></ol>		



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RESEARCH GRANTS

Project :2012/6			
FUNDING AGENCY	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>		
GRANT NO.:	NCST/5/003/3 <sup>rd</sup> CALL PhD/170		
SCHOOL:	<a href="#">PURE AND APPLIED SCIENCES</a>		
DEPARTMENT:	<a href="#">ZOOLOGICAL SCIENCES</a>		
PROJECT TITLE	Occurrence of Multiple Strains, Antibiotic Resistances of Enterotoxigenic <i>Staphylococcus Aureus</i> in Foods of Animal Origins, Nairobi Kenya.		
DURATION	March 2012 to March 2014		
RESEARCH TEAM	<table border="1"><tr><td><p><b>Researcher:</b> John M. Mathenge</p></td><td><p><b>Supervisor:</b> <a href="#">Dr. Michael M. Gicheru;</a> Kenyatta University</p></td></tr></table>	 <p><b>Researcher:</b> John M. Mathenge</p>	 <p><b>Supervisor:</b> <a href="#">Dr. Michael M. Gicheru;</a> Kenyatta University</p>
 <p><b>Researcher:</b> John M. Mathenge</p>	 <p><b>Supervisor:</b> <a href="#">Dr. Michael M. Gicheru;</a> Kenyatta University</p>		
BACKGROUND	<p>Staphylococcus food poisoning (SFP) is considered to be one of the leading causes of all food-borne diseases. <i>Staphylococcus Aureus</i> is a very versatile pathogen of human and causes a wide variety of diseases ranging in severity from slight skin infection to more severe diseases such as pneumonia and septicemia. Despite its pathogenicity, <i>S. Aureus</i> is also harbored in the nares of about 20-30% of healthy people, while about 60% of the population harbors the microorganism intermittently. <i>S. Aureus</i> is present on the skin and mucosa of food producing animal reservoirs, such as ruminants and it is frequently associated to subclinical mastitis leading to contamination of milk and dairy products. In the last few decades SFP has been reported as third cause of food-borne illness in the world. SFP results in a considerable economic and social burden. Since approximately 1.5 billion dollars are spent yearly in the US because of it. Among the foods implicated in SFP, milk dairy products and meats, especially handled foods, play an important role since enterotoxigenic strains of <i>S. Aureus</i> have been frequently isolated in them. Detecting the sources of contamination is crucial for epidemiological purposes and several tests, including biochemical and molecular assays, phage typing, have been developed for <i>S. Aureus</i> typing. Antimicrobial resistance is a major public health problem in many countries due to the persistent circulation of resistant strains of bacteria in the environment and the possible contamination of water and food. Several authors have suggested the administration of antibiotics to food producing animals for therapeutic purposes or as growth promoters may be a primary factor in selecting for antimicrobial-resistant bacteria pathogens. <i>S. Aureus</i> has been reported to frequently show multiple antimicrobial resistance patterns. However, there is a scarcity of information on food poisoning outbreaks in general and staphylococcal</p>		

	<p>food poisoning in occurrence of <i>S. Aureus</i> in milk dairy and meat products marketed in Nairobi Kenya, characterize the isolated strains based on their production of SEs, antimicrobial-resistance pattern and also the genotypic and phenotypic of the isolates and relate them with the characteristic mentioned above. The finding will highlight the potential risks for consumers of meat and dairy products, especially in the absence of strict hygienic and preventive measures.</p>
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RESEARCH GRANTS

<b>Project :2011/6</b>									
<b>FUNDING AGENCY</b>	<a href="#"><u>NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</u></a>								
<b>GRANT NO.:</b>	NCST/5/003/3 <sup>rd</sup> CALL Ph.D/135(2)								
<b>SCHOOL:</b>	<a href="#"><u>PURE AND APPLIED SCIENCES</u></a>								
<b>DEPARTMENT:</b>	<a href="#"><u>ZOOLOGICAL SCIENCES</u></a>								
<b>PROJECT TITLE</b>	Geohelminthiasis and Cognitive Function in Primary School-Age in Class 2-6 of Kasarani, Langata and Riruta Districts, Nairobi County, Kenya.								
<b>DURATION</b>	August 2011 to August 2013								
<b>RESEARCH TEAM</b>	<table border="1" style="width:100%; text-align:center;"> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Researcher:</b> Benedict Mugo Mwenji</td> <td><b>Supervisor:</b> <a href="#"><u>Dr. Michael M. Gicheru.</u></a> Kenyatta University</td> <td><b>Supervisor:</b> Dr. Daksha Hirani (Ph.D. Clin. Psychology)</td> <td><b>Supervisor:</b> Prof. Benson A. Estambale (Ph.D)</td> </tr> </table>					<b>Researcher:</b> Benedict Mugo Mwenji	<b>Supervisor:</b> <a href="#"><u>Dr. Michael M. Gicheru.</u></a> Kenyatta University	<b>Supervisor:</b> Dr. Daksha Hirani (Ph.D. Clin. Psychology)	<b>Supervisor:</b> Prof. Benson A. Estambale (Ph.D)
									
<b>Researcher:</b> Benedict Mugo Mwenji	<b>Supervisor:</b> <a href="#"><u>Dr. Michael M. Gicheru.</u></a> Kenyatta University	<b>Supervisor:</b> Dr. Daksha Hirani (Ph.D. Clin. Psychology)	<b>Supervisor:</b> Prof. Benson A. Estambale (Ph.D)						
<b>BACKGROUND</b>	<p>Geohelminthiasis have been associated with several pathological manifestations including mental and muscular fatigue, poor concentration and lowered cognitive function, lethargy, poor general well-being and listlessness in infected children. Current evidence suggests that geohelminthiasis have a detrimental effect on cognitive function and educational achievements in children; these effects tend to be under-estimated. The aim of the study is to determine the prevalence and intensity of geohelminthiasis and their effect on growth, school attendance, cognitive function and academic performance in school age children in Kasarani, Lang’ata and Dagoretti districts, Nairobi County, Kenya. The data and information obtained from the study will influence and guide national health and education strategies on implementation of effective control programmes for geohelminthiasis in Kenya</p>								



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RESEARCH GRANTS

<b>Project :2011/7</b>				
<b>FUNDING AGENCY</b>	<a href="#"><u>NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</u></a>			
<b>GRANT NO.:</b>	NCST/5/003/POST-DOC/1 <sup>ST</sup> CALL/16			
<b>SCHOOL:</b>	<a href="#"><u>AGRICULTURE AND ENTERPRISE DEVELOPMENT</u></a>			
<b>DEPARTMENT:</b>	<a href="#"><u>AGRICULTURAL SCIENCE AND TECHNOLOGY</u></a>			
<b>PROJECT TITLE</b>	Growth Performance of Goats Supplemented with Indigenous Browse Forage Mixtures in Marginal Areas of Kenya.			
<b>DURATION</b>	December 2011 to December 2013			
<b>RESEARCH TEAM</b>	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%; text-align: center;">   <b>Researcher:</b>  <a href="#"><u>Dr. Isaac Maina Osuga;</u></a>            Kenyatta University         </td> <td style="width:33%; text-align: center;">   <b>Supervisor:</b>            Dr. Abdi Y. Guliye;         </td> <td style="width:33%; text-align: center;">   <b>Supervisor:</b>            Prof. Shaukat A. Abdulrazak         </td> </tr> </table>	 <b>Researcher:</b> <a href="#"><u>Dr. Isaac Maina Osuga;</u></a> Kenyatta University	 <b>Supervisor:</b> Dr. Abdi Y. Guliye;	 <b>Supervisor:</b> Prof. Shaukat A. Abdulrazak
 <b>Researcher:</b> <a href="#"><u>Dr. Isaac Maina Osuga;</u></a> Kenyatta University	 <b>Supervisor:</b> Dr. Abdi Y. Guliye;	 <b>Supervisor:</b> Prof. Shaukat A. Abdulrazak		
<b>BACKGROUND</b>	<p>Goats are an important source of food and income for smallholder farmers especially for the ecologically unstable arid and semi arid lands (marginal areas) with greater constraints to food production. There is also new interest in dairy goat among the rest of Kenyan societies because of special health and nutritive value attached to goat milk and goat milk products. However, in Kenya smallholder dairy goat farmers have not achieved the envisaged performance targets although goats tend to have greater feed utilization efficiency in digesting feed constituents, averaging 63% compared to 56% for cows (Devendra and Burns, 1970). The nutrient conversion efficiency for the production of milk in goats is 45.71%, whereas a dairy cow averages 38%. Goats are 8.6% superior to cows in crude fibre utilization. The maintenance requirements of the goats are also less than for a cow. These unique characteristics of the goats make them suitable for marginal areas of Kenya and other developing countries especially for milk production.</p> <p>However, inadequacy and inconsistency of feed supply is a major bottleneck to efficient animal production in the marginal areas. There is therefore a strong need to identify and use renewable resources that can correct nutrient deficiencies in animals in a sustainable manner. In this regard, multipurpose trees and shrubs offer an attractive alternative in feeding by virtue of their high crude protein content (most deficient macro-nutrient in available feeds for feeding animals in the tropics), mineral content as well as integration in tropical farming (Siaw et al., 1993). The conventional approach to fodder trees and shrubs</p>			

	utilization studies has been to study and exploit "single" species, while the reality is that in many parts of the tropical world, animals eat or are fed with "mixtures" of tree and shrub leaves. This research project, therefore seeks to evaluate available feeds in the marginal areas of Kenya and their mixtures for goat nutrition and improved goat production.
<b>OBJECTIVES</b>	The broad objective of the study is to enhance goat production in marginal areas of Kenya using locally available feed resources.



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RESEARCH GRANTS

Project :2012/7

FUNDING AGENCY

[NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY](#)

GRANT NO.:

NCST/5/003/3<sup>rd</sup> CALL/MSc/097

SCHOOL:

[AGRICULTURE AND ENTERPRISE DEVELOPMENT](#)

DEPARTMENT:

[AGRICULTURAL SCIENCE AND TECHNOLOGY](#)

PROJECT TITLE

Characterization of Sweet Potato (*Ipomea batata L. Lam*) Landraces using Morphological and DNA Markers in East Kamagak Location of Rachuonyo District

DURATION

March 2012 to November 2012

RESEARCH TEAM



**Researcher:**  
Rosally Anyango Onyango



**Supervisor:**  
[Dr Wilson M. Thagana](#);  
Kenyatta University



**Supervisor:**  
[Dr Joseph Onyango Gweji](#);  
Kenyatta University

BACKGROUND

Sweet potato is one of the most important crops for food security and income generation in Kenya. The crop is increasing in importance as adverse climate limit crop production in many areas. The study aims at identifying sweet potato landraces that have high productivity and nutritional quality and high consume acceptance in East Kamagak location of Rachuonyo District. Identification of sweet potato landraces is paramount in addressing food security not only in the study region but elsewhere in the country.

OBJECTIVES

1. To characterize landraces of sweet potato landraces in East Kamagak area using morphological characteristics and DNA markers.
2. To collect germplasm of the landraces and compare their performances alongside newly bred varieties; identify superior varieties and recommend them for cultivation by the farmers.
3. To build capacity of the farmers in Western Kenya to produce, process and market sweet potato.



KENYATTA UNIVERSITY

RESEARCH GRANTS

<b>Project</b>				
<b>FUNDING AGENCY</b>	<a href="#"><u>NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</u></a>			
<b>GRANT NO.:</b>				
<b>SCHOOL:</b>	<a href="#"><u>AGRICULTURE AND ENTERPRISE DEVELOPMENT</u></a>			
<b>DEPARTMENT:</b>	<a href="#"><u>AGRICULTURAL SCIENCE AND TECHNOLOGY</u></a>			
<b>PROJECT TITLE</b>	Identification and Characterization of Sorghum ( <i>Sorghum Bicolor</i> (L.) Moench) Grown In Eastern Kenya; And Improvement of On-Farm Seed Production			
<b>DURATION</b>				
<b>RESEARCH TEAM</b>	<table border="1"><tr><td><p><b>Researcher:</b> <a href="#"><u>Catherine W. Muui;</u></a> Kenyatta University</p></td><td><p><b>Supervisor:</b> <a href="#"><u>Prof. Reuben M. Muasya;</u></a> SEUCO</p></td><td><p><b>Supervisor:</b> <a href="#"><u>Dr. Duncan T. Kirubi;</u></a> Kenyatta University</p></td></tr></table>	 <p><b>Researcher:</b> <a href="#"><u>Catherine W. Muui;</u></a> Kenyatta University</p>	 <p><b>Supervisor:</b> <a href="#"><u>Prof. Reuben M. Muasya;</u></a> SEUCO</p>	 <p><b>Supervisor:</b> <a href="#"><u>Dr. Duncan T. Kirubi;</u></a> Kenyatta University</p>
 <p><b>Researcher:</b> <a href="#"><u>Catherine W. Muui;</u></a> Kenyatta University</p>	 <p><b>Supervisor:</b> <a href="#"><u>Prof. Reuben M. Muasya;</u></a> SEUCO</p>	 <p><b>Supervisor:</b> <a href="#"><u>Dr. Duncan T. Kirubi;</u></a> Kenyatta University</p>		
<b>BACKGROUND</b>	<p>Sorghum (<i>Sorghum bicolor</i> (L.) Moench) is an under-utilized crop and one of the most important cereal crops in semi-arid tropics. In Kenya, sorghum is grown in the often drought-prone marginal agricultural areas of Eastern, Nyanza and Coast Provinces. Due to its C<sub>4</sub> photosynthetic nature, the crop is well adapted to low lands that have higher temperatures, prone to drought and flooding. Sorghum is closely related to maize in utilization, therefore could be an alternative crop in arid areas prone to drought. Farmers maintain landraces through preference selection and obtain seed from different sources such as previous harvest, local market, borrowing from neighbours and commercial outlets. Germplasm collected from the local sources provides greater genetic variability and can furnish useful traits to broaden the genetic base of the under-utilized crop species. Decline in use is eroding the genetic base, preventing use of distinctive useful traits in crop adaptation and improvement, and may result total disappearance. There is lack of available genetic resources for widespread use yet there are many land races in Eastern Kenya that are not known and their genetic diversity has not been established. There is also lack of information on seed production strategies and therefore a lack of quality seeds, lack of information on use, importance and on improved cultural management. Sorghum is highly tolerant to drought, water-logging, saline-alkaline, infertile soil and high temperatures. As an indigenous Kenyan crop, sorghum could provide food security and become a suitable alternative in Eastern Kenya. The region has different landraces maintained by cultural preferences and traditional practices by the farmers.</p> <p>The purpose of this research is to identify the key sorghum landraces grown in eastern</p>			

	Kenya, establish their morphological and genetic diversity, establish quality levels for seed used by farmers, and popularize sorghum as an alternative food crop.
<b>OBJECTIVES</b>	<ol style="list-style-type: none"><li>1. To identify the common sorghum landraces grown by farmers in eastern Kenya</li><li>2. To characterize sorghum landraces grown by farmers in eastern Kenya</li><li>3. To establish the quality of seeds used by farmers</li><li>4. To identify varieties with quality traits</li><li>5. To improve quality of on farm saved seeds</li></ol>



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RESEARCH GRANTS

Project :2012/8				
FUNDING AGENCY	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>			
GRANT NO.:	NCST/5/003/3 <sup>rd</sup> CALL PhD/060			
SCHOOL:	<a href="#">PURE AND APPLIED SCIENCES</a>			
DEPARTMENT:	<a href="#">BIOCHEMISTRY AND BIOTECHNOLOGY</a>			
PROJECT TITLE	<i>Agrobacterium tumefaciens</i> Transformation of Sweet Potato ( <i>Ipomea batata L. Lam</i> ) with C-Repeat Binding Factor 1 (CBF1) and Cytokinin Dehydrogenase (CKX1) Staked Genes to Enhance Drought Tolerance			
DURATION	January 2012 to December 2014			
RESEARCH TEAM	<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 33%;">  <p><b>Researcher:</b> Nzaro G. Makenzi</p> </td> <td style="width: 33%;">  <p><b>Supervisor:</b> <a href="#">Prof. Jesse Machuka;</a> Kenyatta University</p> </td> <td style="width: 33%;">  <p><b>Supervisor:</b> Dr. Sylvester Anami.</p> </td> </tr> </table>	 <p><b>Researcher:</b> Nzaro G. Makenzi</p>	 <p><b>Supervisor:</b> <a href="#">Prof. Jesse Machuka;</a> Kenyatta University</p>	 <p><b>Supervisor:</b> Dr. Sylvester Anami.</p>
 <p><b>Researcher:</b> Nzaro G. Makenzi</p>	 <p><b>Supervisor:</b> <a href="#">Prof. Jesse Machuka;</a> Kenyatta University</p>	 <p><b>Supervisor:</b> Dr. Sylvester Anami.</p>		
COLLABORATORS	Dr. Nyamongo D. and Dr. Mutisya J. of Kenya Agricultural Research Institute (KARI).			
BACKGROUND	<p>Sweet potato is a tuber-bearing species that is high yielding and relatively drought tolerant, with wide adaptability to various climates and farming systems that represents an economically important crop in tropical, subtropical and warm temperate regions. Sweet potato, therefore as one of the orphaned crop, has the potential to play a major role in human nutrition, food security, and poverty alleviation in developing countries. However, the productivity of sweet potato as a crop is adversely affected by biotic and abiotic stresses coupled with poor planting materials. Conventional breeding methods have been employed to improve the crop but are laborious and time consuming for products to reach the farmers. Thus modern biotechnology methods involving transformation is the alternative that offers quicker solution to this problem. The objectives of this study is to develop sweet potato varieties that are more drought tolerant through <i>Agrobacterium tumefaciens</i> transformation with CKX1, CBF1 and stacked CKX1, CBF1 genes using PMI as a selectable marker; carry out molecular analysis of the transformed sweet potato varieties under stress and non stress condition compared with wild type varieties and finally evaluate drought stress tolerance of transformants in the green house and in the field compared to the wild type varieties. Such varieties will go a long way in assisting the resource poor smallholder farmers to be self-sufficient in the food production and assist the country to achieve the millennium development goals.</p>			

<b>OBJECTIVES</b>	<ol style="list-style-type: none"><li data-bbox="440 199 1485 264">1. To collect sweet potato varieties from KARI gene bank, plant, carry out growth and stress tolerance analysis in the greenhouse.</li><li data-bbox="440 297 1485 362">2. To regenerate sweet potato varieties through somatic embryogenesis and optimize PM! Selection protocol for sweet potato.</li><li data-bbox="440 396 1453 423">3. To clone CKX1 and CBF1 into plasmid vector for transformation of sweet potato.</li></ol>
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KENYATTA UNIVERSITY

RESEARCH GRANTS

Project :											
FUNDING AGENCY	<a href="#">NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY</a>										
GRANT NO.:	NCST/5/003/ST&I/WOMEN										
SCHOOL:	<a href="#">PURE AND APPLIED SCIENCES</a>										
DEPARTMENT:	<a href="#">BIOCHEMISTRY AND BIOTECHNOLOGY</a>										
PROJECT TITLE	Delivering Technologies to Salvage and Sustain the High Tunnel (Greenhouse) Innovation for Profitable Smallholder Tomato Production in Rural Kenya.										
DURATION											
RESEARCH TEAM	<table border="0"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Researcher:</b> Dr. Jesca Njeri Mbaka; <a href="#">KARI Thika</a></td> <td><b>Supervisor:</b> <a href="#">Dr. Maina Mwangi</a>; Kenyatta University</td> <td><b>Supervisor:</b> <a href="#">Prisca Githuka</a>; <a href="#">KENFAP</a></td> <td><b>Supervisor:</b> Charity Gathambiri Food specialist;</td> <td><b>Supervisor:</b> Juster Gitonga; Social scientist;</td> </tr> </table>						<b>Researcher:</b> Dr. Jesca Njeri Mbaka; <a href="#">KARI Thika</a>	<b>Supervisor:</b> <a href="#">Dr. Maina Mwangi</a> ; Kenyatta University	<b>Supervisor:</b> <a href="#">Prisca Githuka</a> ; <a href="#">KENFAP</a>	<b>Supervisor:</b> Charity Gathambiri Food specialist;	<b>Supervisor:</b> Juster Gitonga; Social scientist;
											
<b>Researcher:</b> Dr. Jesca Njeri Mbaka; <a href="#">KARI Thika</a>	<b>Supervisor:</b> <a href="#">Dr. Maina Mwangi</a> ; Kenyatta University	<b>Supervisor:</b> <a href="#">Prisca Githuka</a> ; <a href="#">KENFAP</a>	<b>Supervisor:</b> Charity Gathambiri Food specialist;	<b>Supervisor:</b> Juster Gitonga; Social scientist;							
COLLABORATORS	Kenya Agricultural Research Institute-( <b>KARI Thika</b> ); Kenya National Federation of Agricultural Producers ( <b>KENFAP</b> )										
BACKGROUND	Tomato production is mainly by smallholder farmers and has been conventionally under open field conditions until recently when production under modified high tunnels popularly known as ‘greenhouses’ was pioneered by a few farmers and has gained massive adoption in the last 2 to 3 years. The rapid growth in adoption and uptake of the high tunnel innovation has spawned numerous local enterprises that are fabricating and vending tailor-made tunnels for horticultural purposes. The high tunnel production system economizes on space which is advantageous in the context of dwindling arable farm sizes. It is also less labor. Unfortunately the implementation of the high tunnel and other agricultural innovations is under serious threat by pest and diseases. By far the most serious threat to utilization of the high tunnel for tomato production is bacteria wilt caused by <i>Ralstonia solanacearum</i> . Under open field production conditions, areas with high rainfall are unsuitable for tomato production due to prevalence of fungal diseases such as late blight ( <i>Phytophthora infestans</i> ) and early blight ( <i>Alternaria solani</i> ). These diseases are no constraint under high tunnels because the environment is controlled. Under open field conditions, fungal diseases have been effectively controlled by use of fungicides, while bacterial wilt relies on crop rotation and use of plant resistance.										

	<p>Crop rotation is rendered ineffective due to diminishing land sizes and the long survival of bacteria wilt pathogen in water, plant, debris and soil. Plant resistance remains one of the effective options of bacteria wilt management but is limited by lack of resistant varieties with the other traits with high market demand. Efforts are now in the early stages to explore opportunities for using grafted seedlings mainly by grafting superior cultivators on wilt resistant rootstocks. This project aims to accelerate progress towards identifying solutions to bacterial wilt, the most binding constraint threatening success of the high tunnel tomato production technology.</p>
<b>OBJECTIVES</b>	<p>To identify and address knowledge and technology gaps for profitable and sustainable tomato production enterprises in high tunnels in Kiambu, Murang'a, Embu and Kirinyaga counties.</p>



KENYATTA UNIVERSITY

RESEARCH GRANTS

Project :2012/9

FUNDING AGENCY [NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY](#)

GRANT NO.: NCST/5/003/3<sup>rd</sup> CALL PhD/020

SCHOOL: [PURE AND APPLIED SCIENCES](#)

DEPARTMENT: [BIOCHEMISTRY AND BIOTECHNOLOGY](#)

PROJECT TITLE Agrobacterium Tumefaciens mediated Transformation of Sweet Potato with *Xvald1* and *Xvsap1* Genes Isolated from *Xerophytaviscosa* to Enhance Drought Tolerance.

DURATION January 2012 to December 2014.

RESEARCH TEAM



**Researcher:**  
Wilton Mwema Mbinda



**Supervisor:**  
[Dr. Allan Jalemba Mgtu;](#)  
Kenyatta University



**Supervisor:**  
[Dr. Richard Okoth Odour.;](#)  
Kenyatta University

BACKGROUND

Sweet potato is an important component in traditional farming system and feeds millions of people in developing countries. Despite its importance, sweet potato is greatly constrained drought which limits sweet potato productivity. Drought stress reduces the yield and yield stability of sweet potato and increases the incidence of crop failure in dry land production environments. Unique plants such as *Xeropyta viscosa* which exploits a broad range of physiological and molecular responses to enable survival under extreme stress conditions are valuable sources of useful genes for crop improvement. Two genes; *XvAld1* and *XvSap1* that encode aldose reductase and a membrane signaling protein respectively, have been isolated from *X. viscosa* under dehydration stress. Introduction of such pertinent genes into susceptible crops could enhance drought tolerance. The aim of the study is to generate drought-tolerant transgenic sweet potato expressing *XvAld1* and *XvSap1* genes. Responsive cultivators will be stably transformed using *Agrobacterium tumefaciens*. The expression cassette of the two target genes will be cloned into pNOV2819 vector that contains manA gene to enable selection with mannose. Stable integration of the transgenes and estimation of the gene copy number will be confirmed by Southern and Western blot analysis. QRT-PCR will be performed to quantify the expression of *XvAld1* and *XvSap1* genes in the transgenic plants. Phenotypic variations between transgenic and wild type plants will be visually scored and the other plants will be subjected to abiotic stresses and their performance compared. Development on the drought-tolerance transgenic sweet-potato will make enormous impact on global food production to cushion the stress emanating from climate change.

<b>OBJECTIVES</b>	To transform Kenyan sweet potato genotypes with <i>XvAld1</i> and <i>XvSap1</i> genes via <i>Agrobacterium tumefaciens</i> mediated transformations for enhanced drought tolerance.
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