



Prof. Dr.-Ing. Benedict Mwavu Mutua, PhD, Rer. Nat.

BSc Eng. (EU), MEng.Sc. (MELB), PhD, Post Doc (BOKU), Post Doc (ZAL, KIEL, STUT, TELV)

DVC Planning, Partnerships, Research and Innovation

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1. **Family name:** Mutua
2. **First name:** Benedict Mwavu
3. **Date of birth:** 30th November 1966 , Kitui District
4. **Nationality:** Kenyan
5. **Marital status:** Married
6. **Academic Qualifications:**

Institution [Date from - to]	Degree(s) or Diploma(s) obtained:
BOKU University, Austria 2002-2005	Ph.D. Water Resources and Environmental Engineering
BOKU University, Austria June-December 2005, March-May 2015	Postdoctoral Research - Modelling Catchment Hydrology Postdoctoral Research -Assessing the Impact of Climate Change and Land Use/Cover on Water Resources
University of Melbourne, Australia 1997-2001	MEng. Sc. Civil and Environmental Engineering, (Specialised in Fluid Dynamics and Hydraulic Engineering)
Egerton University, Kenya 1991-1996	BSc. Agricultural Engineering (First Class Honours), (Specialised in Soil and Water Engineering)
Egerton University, Kenya 1987-1990	Diploma. Agricultural Engineering (Distinction), (Specialised in Soil and Water Engineering)
Kirangari High School, Kenya 1985-986	Kenya Advanced Certificate of Education, K.A.C.E (“A” Level, 3 Principals, Maths, Physics, Chemistry)
Kabaa High School, Kenya 1981-1984	Kenya Certificate of Education, K.C.E, (“O” Level, Division 1), (1981 – 1984)
Thitani Primary School, Kenya 1974-1980	Certificate of Primary Education (CPE)

6. (b) Selected Short Courses /Training:

Institution [Date from - Date to]	Certificates/Short Course:
BOKU University, Austria, 4 th January to 27 th February 2015	Short Course on <i>Climate Change Impact on Water Resources</i>
BOKU University, Vienna, Austria, 5 th to 9 th May 2014	Short Course on <i>Modelling Hydrological Systems: Coupling Hydrologic Models to Remotely sensed data for improved Water Resources Management</i>
International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), Zaragoza, Spain 23 rd to 27 th September 2013	Post Graduate Certificate in <i>Drought Forecasting and its use in informed decision making</i>
Eawag (Aquatic Research), Zurich, Switzerland, 10 th to 12 th April 2013	PEAK Practise oriented Eawag Course on <i>Planning and Design of Sanitation Systems and Technologies</i>
Seville, Spain, 10 th to 20 th April 2011	Short Course on <i>Wastewater Treatment Technologies for Small Towns and Communities</i>
Australian National University (ANU), 3 rd to 30 th November 2006	Short Course on <i>Catchment Modelling (Modelling Tools and their Application in Water Resources and Environmental Management)</i>
ITC, Netherlands, 3 rd to 15 th June 2005	Short Course on GIS and Remote Sensing and its application in Water Resources Management
Bet-Dagan, Tel Aviv, Israel, Institute of Hydrology and Meteorology, January-February 2002	International Postgraduate Certificate in <i>Data Base Management in Applied Meteorology and Hydrology</i>

6. (c) Specialised Training for improved Service Delivery:

- i) Trained in Pedagogy at Egerton University in 2008
- ii) Trained in Quality Management Systems: Implementation of ISO 9001: 2008 at Egerton University in 2009
- iii) Trained in Students' Academic Advising at Egerton University in 2009
- iv) Trained in Post Graduate Supervision at Malawi College of Medicine in collaboration with London School of Hygiene & Tropical Medicine in Blantyre, Malawi from 30th August to 2nd September 2010
- v) Trained in E- Learning (use of Moodle soft ware) at Egerton University from 16th to 20th May 2011
- vi) Trained in Development and Publishing of Digital Teaching and Learning Materials by Futuristic Ltd, at Egerton University in May 2011
- vii) Trained in Research Management at Chester Hotel, Nakuru, Kenya from 2nd to 4th October 2012

6. (d) Leadership Training:

- i) Corporate Governance- Trained at the School of Kenya Government in 2012
- ii) Strategic Leadership and Change Management – Trained at Kenya School of Government in 2010/2011
- iii) Transformative and Effective Leadership- Trained at the Kenya School of Monetary Studies (KSMS) in 2013

7. **Membership of Professional bodies:**

- i) Engineers Board of Kenya (EBK) Reg. No. B5069
- ii) Institute of Engineers of Kenya (IEK)
- iii) International Association of Hydrological Sciences (IAHS)
- iv) Kenya Society of Agricultural Engineers (KSAE) Reg. No. KW025
- v) Soil and Water Conservation Society (SWCS)

8. **Professional Research Interests:**

- i) Water Resources Engineering, Hydraulics and Fluid Dynamics
- ii) Water Resources Policies, Planning and Management
- iii) Application of GIS and Remote Sensing in Water Resources Management
- iv) River Basin Management through Hydrological Modelling
- v) Impact of Climate Change and Land use change on Water Resources
- vi) Spatial and Temporal Evolution of Hydrological Processes
- vii) Integrated Water Supply and Sanitation Management
- viii) Decentralised Wastewater treatment Systems for Peri-urban and Rural areas Technologies
- ix) Flood and Drought Management (Modelling, Analysis and Mitigation Processes)

9. **Other skills:**

- i) Competent in Scientific Computer Programming
- ii) Modelling of Water Resources and Environmental Engineering Systems
- iii) Capacity building/development in Applied Research
- iv) Design and Development of Short Courses on GIS and Earth observation for Integrated Water Resources Management (IWRM)
- v) Training Supervisors for Post Graduate Supervision
- vi) Design and Implementation of Urine Diverting Dry Ecological Systems (UDDTs)
- vii) Consultant in Water Resources Management

10. **Recognition, Awards and Visiting Professorial duties:**

- i) Invited as a **Visiting Professor** to teach Fluid Mechanics, IWRM and Hydrology at the Pan African University, Institute of Water Engineering and Energy (PAUWES) at Tlemcen University, Algeria from 28th November to 18th December 2015 and from 1st January to 4th February 2016.
- ii) Awarded three (3) Months, **Professorial Visiting Research** Scholarship at BOKU University, Vienna Austria, under the OeAD Ernst Mach Scholarship through the Centre for International Cooperation & Mobility, Austria from 1st March to 30th May 2015.
- iii) Awarded a scholarship by BOKU University Vienna, Austria to pursue a **Short Course** training in Advanced SWAT Modelling conducted at BOKU University in collaboration with TAMU, USA from 1st to 12th June 2015.
- iv) Awarded a **Certificate of Excellent Performance** by Egerton University for 2014/2015 Academic year.
- v) Awarded a **Trophy for the best achiever** by Egerton University for 2013/2014 Academic year.
- vi) Recognised by *Marquis Who is Who* in the World for my research contribution in the “*Field of Engineering and Science*”. My name was published in the 25th edition, 2007 in *Marquis who’s Who* in the World.
- vii) Recognised as the **best Lecturer** for the category of between 20 and 100 students at Egerton University on 30th January 2010.

- viii) Awarded **PhD Scholarship** by the Austrian Exchange Service, Agency for International Cooperation in Education (ÖAD), to pursue PhD studies at the University of Natural Resources and Life Sciences (BOKU) Vienna, Austria from 2002 to 2005.
- ix) Awarded a **short Post Doctoral Research Scholarship** by the Austrian Exchange Service, Agency for International Cooperation in Education (ÖAD) to carryout research on “*Modelling and Prediction of Stream Flow for ungauged catchments in the Lower Austria Region*” from June – December 2005.
- x) Awarded **Scholarship** by the Government of Israel to attend an International Course in *Database Management for Applied Hydrology and Meteorology in Israel* from *January* – February 2002.
- xi) Awarded the Prestigious Melbourne International **Post Graduate Research Scholarship (MIPGRS)** to pursue a Master of Engineering Science (MEng. Sc) in Australia from 1997 to 2000.
- xii) Granted a Paid study leave to pursue a B.Sc. degree in Agricultural Engineering at Egerton University, Kenya from 1991 to 1995.
- xiii) Awarded Research funds to carry out research on Irrigation practices at *Kitengela* (Kenya), by NACITI Engineers, Kenya from March to September 1990.

11. Specific Experience, Collaborative Research and Joint Postgraduate Supervision with Universities in other Countries:

Country	Date from - Date to
Australia - University of Melbourne	1997-2000; Postgraduate training 2002-2005, 2006 to date; -Collaborative Research Projects on Flow Dynamics and Water Resources Management
Austria - University of Natural Resources and Life Sciences (Universität für Bodenkultur Wien, (BOKU))	2002 – 2005; PhD and Postdoctoral Research 2006 to date; -Partnering on Research Projects on Water and Sanitation - <i>Joint Postgraduate Supervision</i> -PhD Training, Post Doctoral Research - <i>Joint Post Graduate Supervision</i> - <i>Staff Exchange Programme</i>
Ethiopia - Mekelle, Haramaya, Hawassa, Bahir Dar, Arba Minch Universities	2006-to date; -On-going Research Projects on Water Resources Management - <i>Joint Postgraduate Supervision</i>
Uganda - Makerere and Mbarara Universities	2006-2010; -Partnering on Research Projects on Water and Sanitation - <i>Joint Postgraduate Supervision</i>
Tanzania - University of Dar es Salaam	2006-2013; -Collaborative Research Projects on Water and Sanitation -Water Resources Engineering - <i>Joint Postgraduate Supervision</i>
UK - Loughborough University, Water, Engineering and Development Centre (WEDC),	2008-to date; -Collaborative Research Projects on Water and Sanitation - <i>Joint Postgraduate Supervision</i>
Mozambique -Eduardo Mondlane University	2008 to 2010; -Partnering on Joint Research Projects on Water and Sanitation

The Netherlands -ITC University of Twente, University of Amsterdam, UNESCO-IHE	2005-todate; -On-going Research Projects on application of GIS and Remote Sensing in Water Resources Management, <i>-Postgraduate Training and Joint Supervision</i>
South Africa - University of Kwa Zulu Natal (UKZN)	2011 to date; -Partnering on Research Projects on Water and Sanitation <i>- Collaborative Postgraduate Supervision</i>
Ghana - Kwame Nkrumah University of Science and Technology	2010 to date; -Partnering on Research Projects on Water and Sanitation <i>Joint Postgraduate Supervision</i>
Malawi - University of Malawi, College of Medicine, Blantyre	2010 to date; -Partnering on Research Projects on Water and Sanitation <i>-Training on Short Courses on Postgraduate Supervision</i>
UK - London School of Hygiene and Tropical Medicine (LSHTM)	2009 to date; -Partnering on Research Projects on Water and Sanitation, -Environmental Health <i>-Joint Postgraduate Supervision</i>
Burkina Faso- Centre Regional Pour L'eau Potable Et L'assainissement A Faible Cout (CREPA)	2011 to date; -Partnering on Research Projects on Water and Sanitation
Spain - Universidad Carlos III de Madrid and Polit�cnica de Madrid	2011 to date; -Partnering on Research Projects on Water resources Engineering, Systems management, -Wastewater Treatment for Small Towns -Collaborative research on Climate Change <i>- Joint Supervision Postgraduate Supervision</i>
Sudan - Gezira University	2009 to date Partnering on Research Projects on Water, Sanitation, Hygiene and Health for Development
UK- East Anglia University	2009 to date Partnering on Research Projects on Water, Sanitation, Hygiene and Health for Development
South Africa - University of Venda	2009 to date; -Partnering on Research Projects on Water, Sanitation, Hygiene and Health for Development <i>-Joint Postgraduate Supervision</i>
South Africa -Tshwane University of Science and Technology	2009 to date; -Partnering on Research Projects on Water, Sanitation, Hygiene and Health for Development <i>- Joint Postgraduate Supervision</i>

12. Key positions at held:

- i) Director- Board of Postgraduate Studies at Egerton University (April to 1st July 2016)
- ii) Associate Professor of Water Resources and Environmental Engineering (4th April 2013 to date)
- iii) Chair - Postgraduate Committee at the Faculty of Engineering and Technology (July 2012 to July)
- iv) Coordinator - Research, Innovation and Patent at the Faculty of Engineering and Technology (July 2012 to July 2016)
- v) Editorial Board Member - Egerton Journal of Science and Technology (July 2014 to date)

- vi) Chair -Training on Postgraduate Supervision at Egerton University (November 2010 to July 2016)
- v) Coordinator - University Open Day Exhibition for the Faculty of Engineering and Technology (July 2012 to July 2016)
- vi) Chair - Sub-Committee on Assessing Internally Funded Research and Innovation projects (2009 to July 2016)

13. Previous Key positions at Egerton University:

- i) Dean - Faculty of Engineering and Technology, Egerton University (6th June 2008 to 23rd July 2012 (Four years))
- ii) Ag. Chairman of Department (COD) - Department of Agricultural Engineering, Egerton University (January - May 2006; May- June 2007; March- April 2008)
- iii) Chair - Development of University Research Policy (2012)
- iv) Chair - Renovation and Refurbishing of the Faculty of Engineering and Technology Workshops and Laboratories (2011/2012 Financial Year)
- v) Chair- Renovation and Refurbishing of the modern Graduation Square (2011)
- vi) Chair- Landscaping for the Faculties of Engineering and Agriculture (2011-2012)
- vii) Council Member- Laikipia University College (2010-2012)
- viii) Chair- Development of two (2) MSc Engineering Programmes in (a) Water Resources and Environmental Management (2006-2007) and (b) Soil and Water Engineering (2007-2008)
- ix) Chair- Decoration and Maintenance Graduation Sub-Committee (2008-2012)
- x) Coordinator - Self Sponsored Students in the Faculty of Engineering and Technology (January 2006 to June 2008).
- xi) Departmental Examination Officer- Department of Agricultural Engineering (2000-2002)

14. International Scientific Committees:

- i) Member of Pan African University (PAUWES) on formulating Water Engineering Postgraduate Programmes (2015 to date)
- ii) Member of *SmallWater 11* Scientific Committee: Main Office in Seville, Spain (2011 to date).
- iii) Member of the *WEDC* International Conference Scientific Committee (2011-to date). Main Office in WEDC, Loughborough, UK.
- iv) Member of the Water Resources Mapping in Africa: Main office in Durban South Africa (2012 to date).

15. Period worked at Egerton University:

From September 27th 1990 to 1st July 2016

16. Employment/Professional Experience and Responsibilities:

Date: From to	Position	Key Responsibilities
1 st July 2016 to date	Deputy Vice Chancellor in charge of Planning, Partnerships, Research and Innovation (PPRI) at Kibabii University	<ul style="list-style-type: none"> • Providing leadership in the management of the Planning, Partnerships, Research and innovation activities of the University • Promoting learning, research, innovation and extension services in the University • Coordinating research activities, student attachment and linkages with the industry • Developing and implement intellectual property policy as well as oversee linkages and • partnerships with other national and international institutions • Planning and mobilize resources for teaching, innovation and extension services • Coordinating all academic collaborations and linkages with other local/international partners initiating programmes in research, scholarships, student and staff exchange
April 2016 to 1 st July 2016	Director Board of Postgraduate Studies at Egerton University	<ul style="list-style-type: none"> • Being responsible for all Postgraduate Students admission, proposals and theses preparations • Vetting of Graduate Curricula as per Rules and Regulations governing them • Admission of Postgraduate Students • Proper Conduct and Supervision of Programmes, the Administration and Processing of Examination Results, Research Projects and Thesis • The general Welfare and Discipline of Postgraduate Students • Administration of Graduate Scholarships and Research Grant
	Associate Professor of Water Resources and	<ul style="list-style-type: none"> • Teaching, Research and Supervision of Undergraduate, MSc and PhD, Postdoctoral Students • Being responsible to the Head of the Department, Dean of the Faculty • Performing University duties assigned to me by the relevant University Authorities • Proving Leadership in Academic and Research and Innovation within the

April 2013 to date	Environmental Engineering at Egerton University	<p>Faculty of Engineering and at the University</p> <ul style="list-style-type: none"> • Providing Academic Advising to Postgraduate and Undergraduate (Years 1 and 5 students) • Chair- Soil and Water Engineering Thematic areas • Member – Faculty of Engineering and Technology Management Board, Faculty Examination Board and Departmental Board
2010-2012	Member of Council- Laikipia University College	<ul style="list-style-type: none"> • Chair- Planning and Development Sub-Committee of the Council • Being involved in Council matters such as approval of University College budgets, policies, handling disciplinary cases, recruitment, etc
June 2008-July 2012	Dean- Faculty of Engineering and Technology, Egerton University	<ul style="list-style-type: none"> • Administration and overseeing execution of all academic programmes within the Faculty of Engineering and Technology (FET) • Providing administrative and academic leaderships to both students and the staff in the Faculty • Managing the examinations processes at the Faculty and preparing the required Faculty documents by the University Senate • Acting as the main link between the Faculty and the University Management Board (UMB) • Member of the University Senate • Member of the University Budget Committee • Member of Deans Committee • Overseeing the preparation, implementation of the Performance Contracting at the Faculty and preparing the quarterly reports • Preparing all the statutory Reports for the Faculty e.g. Faculty Budget Procurement Plans, Performance Contracting Quarterly and Final Reports • Coordinating the implementation of the ISO 9001: 2008 Procedures at the Faculty level • Teaching, Research and Supervision of Undergraduate, MSc and PhD Students • Being responsible to the DVC Academic Affairs • Performing any other duties assigned to me by the DVCs and/or the VC
2007-2013	Senior Lecturer at Egerton University	<ul style="list-style-type: none"> • Teaching, Research and Supervision of Undergraduate, MSc and PhD Students • Academic Advisor for Postgraduate and Year 1 students • Chair- Development of MSc Programmes in Soil and Water Engineering;

		Water Resources and Environmental Management • Member- Departmental and Faculty Boards
March - April 2008, May - June 2007, January- May 2006	Ag. CoD – Department of Agricultural Engineering at Egerton University	<ul style="list-style-type: none"> • Coordinating the teaching and administrative duties in the Department of Agricultural Engineering, and any other duties assigned by the Dean, Faculty of Engineering and Technology • Attending Senate and Faculty Management and Examination Boards meeting
June 2006 - July 2008	Coordinator- Self Sponsored Programmes (SSP) Faculty of Engineering and Technology, Egerton University	<ul style="list-style-type: none"> • Coordinating all matters related to SSP in consultation with CoDs in FET and Dean FET
2003-2007	Lecturer at Egerton University	<ul style="list-style-type: none"> • Teaching and conducting research • Performing any other duties assigned by the Head of Department
2000- 2002	Departmental Examination Officer, Department of Agricultural Engineering, Egerton University	<ul style="list-style-type: none"> • In charge of the Departmental Examinations, ensuring that Examination were Processed as per the University Rules and Regulations in consultation with the CoD Agricultural Engineering
2000-2003	Assistant Lecturer	<ul style="list-style-type: none"> • Teaching and conducting research • Performing any other duties assigned by the Head of Department
1998-1999	Tutorial Fellow at the University of Melbourne, Australia	<ul style="list-style-type: none"> • Graduate Assistant in Applied Hydraulics and Fluid Mechanics (Assisting in Teaching and Practicals for BSc. Engineering students at the University of Melbourne, Australia)
1995-1997	Teaching Assistant at Egerton University	<ul style="list-style-type: none"> • Teaching Diploma students and assisting in Practicals for BSc. Agricultural Engineering students • Performing any other duties assigned by the Head of Department
1990-1991	Demonstrator at Egerton University, Department of Agricultural Engineering	<ul style="list-style-type: none"> • Teaching Diploma students and assisting in Engineering Practicals • Performing any other duties assigned by the Head of Department
March-September 1990	Irrigation Engineer at NACITI Engineers, Athi River	<ul style="list-style-type: none"> • In charge of the design and implementation of the Irrigation and Drainage Engineering works • Preparing the Bill of Quantities (BoQs) for the Irrigation and Drainage Systems and the supervising the layout and operation of the Irrigation systems

17. International Professional Work Experience and Appointments:

Date: From to	Position	Key Responsibilities
November 2015 to date	Coordinator for Pan African University, Institute of Water and Energy Sciences (PAUWES) at Tlemcen University, Algeria	<ul style="list-style-type: none"> • Chair and Coordinator of the Working Group on Water Engineering and Water Policy Programmes for Masters and PhD • To set up a Centre/Institute of Excellency to train highly skilled Water Engineers and Water Policy Makers
2012-to date	Regional Coordinator- Water Resources Management for Eastern, Western, Northern and Southern African Nodes	<ul style="list-style-type: none"> • Coordinator for the Water Resources Management Teams in the established nodes in Africa. • Chair the Sub-Committee dealing with water Resources challenges in Developing Countries • Prepare the Strategic Management Plans, Coordinate Data Collections and Analysis of water and sanitation in the selected countries; Kenya, Uganda, Ethiopia, Tunisia, Morocco, Burkina Faso, Tanzania, South Africa, Ghana and Malawi • Presenting the findings to the main office in Addis Ababa after every six months
2010-to date	Southern Coordinator- S::CAN LTD, Vienna, on Innovative Technologies and Knowledge Transfer for Ecological Sanitation Systems	<ul style="list-style-type: none"> • Coordinator for the S::CAN Projects on Ecological Sanitation • Design, Develop and Implement appropriate Integrated Water supply and Sanitation Systems that address water scarcity challenges
2011-todate	Kenyan Rep.- Decentralised Wastewater Treatment Technologies, Main Office Seville, Spain	<ul style="list-style-type: none"> • Coordinating the Eastern African Team on Designing and Implementing Decentralised Integrated Water and Sanitation Technologies for small and fast growing towns and communities • Preparing Quarterly Activities and Financial Reports and submitting them to the main Office in Seville Spain
2009-todate	Egerton University Co-Coordinator for the International Postgraduate Certificate Course in Application of GIS and Remote Sensing in Water Resources Management	<ul style="list-style-type: none"> • Coordinating the execution of the International Postgraduate Certificate Course • Coordinating the preparation of the teaching materials • Coordinating the preparation of the budget for teaching the course • Coordinating the admission of the Postgraduate students

18. Research Experience and Funds Attracted:

Summary of Funded Research Projects (On-going and Completed Projects)

Date from - to	Position	Responsibility	Project Description and/or Title	Amount Attracted
2016-2018	Project Coordinator	Overall Project Coordinator for the Austrian Partnership Programme in Higher Education and Research for Development (APPEAR). A Research Project funded by the Austrian Development Cooperation.	“Strengthening Capacities for Agricultural education, Research and Adoption in Kenya” (<i>SCARA</i>)	€ 269,995.00
2013-2016	Work Package Leader (PI) for Kenya	-Coordinating and Managing the Research Activities as per the Project guidelines -Facilitating the capacity development through Training of 5 MSc. and 3 PhD candidates under this Project	“Sustainable Sanitation for Peri-urban poor communities in the proximity of Eco-Tourism industry”(<i>SUSPET</i>) Project under the ACP-EU Co-operation Programme in Science and Technology (S&TII), the Intra-ACP Envelope of the 10th European Development & Budget Line 2011 21.06.02 Reference: Europe Aid/133437/D/ACT/ACPTPS for 10 African Countries	€ 350,000.00
2012-2015	Eastern Africa Coordinator	Coordinating all the Project activities in Eastern Africa	Effects of climate variability and land use change on the water resources for large river basins in Eastern, Southern, Western and Northern Africa, A EU 7 th Framework Programme on sustainable water resources main office, Seville, Spain (<i>CLWRA</i>).	€ 500,000.00
2011-2014	Project Work Package Leader (PI)	-Country Work Package Leader for CLARA Project -Coordinating all activities in CLARA Project including research and administrative duties	“Capacity-Liked water and sanitation for peri-urban and Rural Areas (<i>CLARA</i>)” Project Contract No. 265676), a EU 7 th Framework Programme (FP7) funded projects dealing with Water and Sanitation.	€ 200,000.00

2011-2014	Co-Principal Investigator	-Designing appropriate Rainwater harvesting systems	“Promotion of surface runoff and rainwater harvesting Technologies for application in Aquaculture and horticulture development in Kitui District, Kenya” Funded by National Council of Science and Technology (NCST). Now the National Commission for Science, Technology and Innovation (NACOSTI).	KES 7,000,000.00
2011-2013	PI for the South Africa – Kenya Joint Science & Technology Research Programme	-Coordinating the research activities for the two partner countries -Chairing the Board that nominated the MSc and PhD students for the partial scholarship offer	“Life cycle costing of rainwater harvesting in two African cities: Johannesburg and Nairobi” Funded by National Council of Science and Technology (NCST) (NACOSTI).	KES 3,000,000.00
2010-2014	Main PhD Supervisor	-PhD Supervisor on the Research Project -Ensuring that the research funds are utilised as the PhD work plan and budget that had been submitted to NCST	“Optimizing Human Waste Treatment and Bio-Resource Recovery using a Hybrid Multi-Port Reactor”. Funded by National Council of Science and Technology (NCST).	KES 1,500,00.00)
2010-2011	Principal Investigator	-Coordinated and supervised the utilisation of the funds as per the set work plan and project budget -Coordinated the design and construction of the wetland	“Hydraulic performance of a Constructed Wetland and Sodis System in effluent Polishing: a Case study of Egerton University ponds, Kenya”. Internally funded by the University.	KES 297,000.00)
2010-2011	Principal Investigator	Coordinated and supervised the utilisation of the funds as per the set work plan and project budget -Coordinated the design and construction and implementation of the milking machine	PI for Innovation Projects on “Design and implementation of a Hand operated Vacuum Pump and Electronic Pulsator suitable for Milking Machines”. Internally funded by the University under – <i>Technology and Innovation Funds</i> .	KES 500,000.00

2009-todate	Co-PI	In charge of research area on “Building African capacity for interdisciplinary research in water supply, sanitation and environmental health in African Universities	“Scientists Networked for Outcomes from Water and Sanitation (SNOWS)” Project Funded by the Wellcome Trust through its African Institutions Initiative	£35,000.00
2006-2010	Project Work Package Leader (PI)	Coordination of all activities in ROSA Project including research and administrative duties. -My main duties were to coordinate and give directions to other researchers in the project. - To ensure that the finances and activities were done as per the project requirements. To organise conferences and workshops. -Working with Community Based Organizations (CBOs) in Sustainable Sanitation and Integrated Water Resources Management.	“Resources Oriented Sanitation for peri-urban Areas in Africa (ROSA)” Project- (Contract No. 037025), a EU 6 th Framework Programme (FP6) funded projects dealing with Water, Sanitation and Health.	€ 300,000.00
2006-2008	Principal Investigator for Kenya	-In charge of research on Water resources. -Coordinated and Supervised Students researching on Integrated Water Resources Management in Arid and Semi Arid areas in Africa	“Water Resources Management in Eastern Africa (WATERMAN)” Project (Contract No. 031694), a EU 6 th Frame Work Programme (FP6) funded project dealing with Integrated Water Resources Management (IWRM).	€150,000.00

2009 to date	Principal Investigator and country representative	<ul style="list-style-type: none"> -Leading researcher and adviser for Sustainable Water, Sanitation, Health and Education for Schools in Peri-urban area and low income areas within Nakuru and Baringo Counties, , Kenya. -In charge of developing Field-based interdisciplinary research in Water, Sanitation Health and Education -Design and implementation of UDDTs for School Design of Decentralised Wastewater and reuse systems 	“School Water, Sanitation, Health and Education (WASHE)” Project sponsored by S:CAN LTD and BOKU University	€400,000.00
2006-2009	Principal Investigator and Lead Researcher	key researcher on the issues concerning the optimisation of the water resources within the Turkwel River Basin	“Optimising the Turkwel River Water Resource for the improved sustainable livelihoods” Research project sponsored by UNEP/UNOPS	€31,250.00.

19. Major Research Project Proposal(s) Submitted for Funding:

- i) The Horizon 2020 Call: H2020-WATER-2015-two-stage Topic: WATER-5c-2015 Type of action: RIA Proposal number: 689492-1. Title of proposal: ***Data-Driven Decision making for sustainable Planning Operation and Maintenance of water supply systems in Eastern Africa (D3POM)*** {€ 2.624.563. 00} (2016-2019).
- ii) Austrian Partnership Programme in Higher Education and Research for Development (APPEAR). A call for research projects to be funded by the Austrian Development Cooperation. Proposal: ***Feasibility study for joint Water-Sanitation Master Programme (WatSan Master)***, proposed period {€ 250,000.00} (2016-2019).
- iii) The 12th European Development Fund; African Union Research Grants (2016-2019): Reference, HRST/ST/AURG/CALL1/2011. The African Component of the ACP Research Programme for Sustainable Development in Water and Sanitation. Ref: EuropeAid/130-741/D/ACT/ACP: Funds applied for under this call is {€1,750,000.00}.
- iv) Supporting the African-led development of world-class researchers and research leaders in Africa. The main objective is to produce world-class scientific research that addresses African health and research priorities through scientific discourse and collaborative supervision. The call theme is Developing Excellence in Leadership, Training and Science Initiative (DELTAS) Africa. The proposal Title is **SNOWS for BREADTH**. Funds applied for {£40,000, 000.00} (2015-2019).
- v) Royal Society - DFID Africa Capacity Building Initiative researchers aiming to strengthen research and training capacity across sub-Saharan Africa by creating sustainable scientific networks. Proposal on **Designing and Implementing new Technologies on Water and Sanitation for sub-Saharan Africa**: Funds applied for {£3,500,000.00} (2015-2017).

20. Publications (Books, Book Chapters and Articles in Refereed Journals):

2011-2016: Books and Book Chapters:

1. James M. Raude, **Benedict M. Mutua** and Japheth O. Onyando. (2011). *Surface Runoff and Soil Loss under varying Rainfall Intensity in Selected Land Use Practices from River Njoro Catchment-Kenya: A Book* published by LAP Lambert Academic Publishing. ISBN 978-3-8443-0356-8. Printed in the UK. pp 1-78.
2. Raphael M. Wambua, **Benedict M. Mutua**, and James M. Raude. (2015). Stochastic Drought Forecasting Exploration for Water Resources Management in the Upper Tana River Basin, Kenya. A **Book Chapter** in the *Handbook of Research on Computational Simulation and Modeling in Engineering*, **Chapter 17**: 512-546. DOI: 10.4018/978-1-4666-8823-0.ch0 17.

2016: Selected Scientific Articles Published in Refereed Journals

3. Wambua, R. M., **Mutua, B. M.** and Raude, J. M. (2016). Prediction of Missing Hydro-Meteorological Data Series using Artificial Neural Networks (ANN) for Upper Tana River basin, Kenya, *American Journal of Water Resources*, 4(2): 35-43.

2015: Selected Scientific Articles Published in Refereed Journals

4. Wambua, R. M., **Mutua, B. M.** and Raude, J. M. (2015). Hydrological drought frequency estimation using stream flow drought index and modified Gumbel method in upper Tana River basin, *International Journal of current research and review*, 7(22): 42-51.

5. Raphael M. Wambua, **Benedict M. Mutua**, and James M. Raude. (2015). Hydrological Drought Frequency Estimation using Stream Flow Drought Index and Modified Gumbel Method in upper Tana River Basin, *International Journal of Current Research and Review*, 7(22):42-51.
6. Macben Makenzi, Nelson Timonah, **Benedict M. Mutua** and Ismael Abisai. (2015). Degradation Prevalence Study of Field-Aged Photovoltaic Modules Operating Under Kenyan Climatic Conditions. *Science Journal of Energy Engineering*, 3(1): 1-5.doi: 10.11648/j.sjee.20150301.11.
7. Macben Makenzi, Nelson Timonah, **Benedict M. Mutua** and Ismael Abisai. (2015). Power Degradation and Its Climatic Correlation in Field-Aged Photovoltaic Modules Operating in Kenya. *International Journal of Science & Technology*, 3(1): 140-153.
8. Raphael M. Wambua, **Benedict M. Mutua**, and James M. Raude (2015). Spatio-temporal Drought Characterization for the Upper Tana River Basin, Kenya Using Standardized Precipitation Index (SPI). *World Journal of Environmental Engineering*, 3(4): 111-120. DOI: 10.12691/wjee-3-4-2.
9. Imbenzi J. Serede, **Benedict M. Mutua** and James M. Raude. (2015). Calibration of Channel Roughness Coefficient for Thiba Main Canal Reach in Mwea Irrigation Scheme, Kenya. *Hydrology*, 3(6): 55-65. doi: 10.11648/j.hyd.20150306.11.

2014: Selected Scientific Articles Published in Refereed Journals

10. Marshal M. Kyambia and **Benedict M. Mutua**. (2014). Detection of trends in extreme streamflow due to climate variability in the Lake Naivasha basin, Kenya. *International Journal of River Basin Management (IJRBM)*, 12(4):1-7.doi:10.1080/15715124.2014.967255.
11. Raphael M. Wambua, **Benedict M. Mutua** and James M. Raude. (2014). Performance of Standardized Precipitation Index (SPI) and Effective Drought Index (EDI) in Drought forecasting using Artificial Neural Networks (ANNs) for upper Tana River basin, Kenya. *International Journal of Engineering Research & Technology (IJERT)*, 3(11): 547-556.
12. Imbenzi J. Serede, **Benedict M. Mutua**, James M. Raude. (2014). A Review for Hydraulic Analysis of Irrigation Canals Using HEC-RAS Model: A Case Study of Mwea Irrigation Scheme, Kenya. *Hydrology*, 2(1):1-5.doi: 10.11648/j.hyd.20140201.11.
13. Raphael M. Wambua, **Benedict M. Mutua** and James M. Raude. (2014). Drought Indices Assessment for Sustainable Water Resources Management-a Case Review for upper Tana River basin, Kenya. *International Journal of Engineering Research & Technology (IJERT)*, 3(10):429-438.
14. Marshal M. Kyambia and **Benedict M. Mutua**. (2014). Analysis of drought effect on annual stream flows of River Malewa in the Lake Naivasha Basin, Kenya. *International Journal of Current Research and Review (IJCRR)*, 6(18): 1-6.
15. Raphael M. Wambua and **Benedict M. Mutua**. (2014). Evaluation of Drip Irrigation and Greenhouse Systems in production of tomatoes in Arid and Semi-Arid lands, Kenya. *European International Journal of Science and Technology*, 3(5): 1-12.
16. Wesley K. Kirui and **Benedict M. Mutua**. (2014). Simulation of Catchment Hydrologic Response under Changing Land Use: Case of Upper Molo River Catchment, Kenya. *European International Journal of Applied Science and Technology*, 1(4): 1-25.

17. Kelly A. W. Kariuki, **Benedict M. Mutua**, and Musa R. Njue. (2014). Using Intermittent Sand Filters of Various Depths to Remove NH₃-N, NO₃N and NO₂N from the Wastewater of Sugar Milling Factory. *Civil and Environmental Research*, 6(8): 24-30.
18. Wambua, R.M., **Mutua, B. M.**, Raude, J.M. (2014). Drought Forecasting Using Indices and Artificial Neural Networks for Upper Tana River Basin, Kenya-A Review Concept. *J Civil Environ Eng*, 4 (4): 152. doi:10.4172/2165-784X.1000152.

2013: Selected Scientific Articles Published in Refereed Journals

19. V.O. Odongo, J.O. Onyando, **B.M. Mutua**, P.R. van Oel, and R. Becht. (2013). Sensitivity analysis and calibration of the Modified Universal Soil Loss Equation (MUSLE) for the upper Malewa Catchment, Kenya. *International Journal of Sediment Research*. 28 (2013): 368-383.
20. Dishon M. Mkaya, **Benedict M. Mutua** and Peter M. Kundu. (2013). Evaluation of the impact of land use change on catchment hydrology: The case of Wundanyi River catchment in Taita Hills, Kenya. *Research Journal of Agricultural and Environmental Management*, 2(5): 092-098, May, 2013.

2012: Selected Scientific Articles Published in Refereed Journals

21. Raude, J.M., **Mutua, B.M.** and Kamau, D.N. (2012). Design of Pilot Scale Horizontal Subsurface Flow Constructed Wetland System Treating Greywater. *International Journal of Current Research and Review*, 4(2): 92-104.
22. Caroline W. Maina, **Benedict M. Mutua** and Steve O. Oduor. (2012). Simulation of constructed wetland treatment in wastewater polishing using PREWet model. *Journal of Desalination and Water Treatment*, 41(1-3): 356-363. DOI: 10.1080/19443994.2012.664739.

2011: Selected Scientific Articles Published in Refereed Journals

23. C. W. Maina, **B. M. Mutua** and S. O. Oduor. (2011). Evaluating performance of vertical flow constructed wetland under various hydraulic loading rates in effluent polishing. *Journal of Water Sanitation and Hygiene*, 1(2):144-151. DOI: 10. 2166/Washdev 2011.025.

2010: Selected Scientific Articles Published in Refereed Journals

24. Maina, C.W., **Mutua, B.M.**, Oduor, S.O. and Raude, J.M. (2010). Water Quality and Self-Purification Ability of River Njoro, Kenya. *Eger. J. Scie. Technol*, 10: 123-138.
25. Akuja T.E., Ngigi M.W., Gichaba C.M., Guliye A.Y., **Mutua B.M.**, Abdulrazak S.A. and Karachi M. (2010). Optimization of Turkwel river water resources for improved sustainable livelihoods: A socio-economic approach, *Journal of Applied Biosciences*, 35:2310-2324.
26. E. Muchiri, **B. M. Mutua** and E. Müllegger. (2010a). Private sector involvement in operating a sanitation system with urine diversion dry toilets in Nakuru, Kenya. *Sustainable Sanitation Practice (SSP)*, 1(2): 22-25.
27. R. M. Gacheiya and **B.M. Mutua**. (2010b). Implementation of urine-diversion toilets in schools in Nakuru, Kenya. *Sustainable Sanitation Practice (SSP)*, 1(4): 14-17.

2009: Selected Scientific Articles Published in Refereed Journals

28. Wambua, R. M., **Mutua, B.M.**, Nyaanga, D.M. and Kundu, P.M. (2009). Classification of Catchment Risk Areas using Spatially Distributed Event- Based Soil Erosion: A Case of Upper Njoro River Catchment, Kenya. *Int. Journal of Design & Nature, and Ecodynamics*, 3(4): 1–15.
29. Akuja, T.E., **Mutua, B.M.**, Guliye, A.Y., Gichaba, C.M., Ngigi, M.W., Karachi and M., Abdulrazak, S.A. (2009). Trends and current status of indigenous knowledge among the inhabitants of the Turkwel riverine in Kenya: IKS community development and resilience. *Indilinga, African Journal of Indigenous Knowledge Systems*, 8(2): 209-217
30. J. Raude, **B. M. Mutua**, M. Chemelil, L. Kraft, and K. Sleytr. (2009). Household grey water treatment for peri-urban areas of Nakuru Municipality, Kenya. *Sustainable Sanitation Practice (SSP)*, 1(1): 10-15.

2008: Selected Scientific Articles Published in Refereed Journals

31. Wambua, R.M., **Mutua, B.M.** and Nyaanga, D.M. (2008). Estimation of Spatially distributed event-based Runoff and Sediment yield within Njoro Catchment, Kenya. *Journal of Pure and Applied Science*, 1(1): 39-49.

2007: Selected Scientific Articles Published in Refereed Journals

32. **Mutua, B.M.** and Klik, A. (2007). Predicting daily streamflow in ungauged rural catchments: the case of Masinga catchment, Kenya, *Hydrological Sciences Journal*, 52(2): 292-304.

2006: Selected Scientific Articles Published in Refereed Journals

33. **Mutua, B.M.** and Klik, A. (2006). Modelling Long-Term Mean Hillslope Erosion at a Large Catchment Scale, *International Journal of Ecodynamics*, 1(1): 72-89.
34. **Mutua, B.M.** and Klik, A. (2006). Estimating Spatial Sediment Delivery Ratio on a Large Rural Catchment, *Journal of Spatial Hydrology*, Spring, 6(1): 64-80.
35. **Mutua, B.M.**, Klik, A. and Loiskandl, W. (2006). Modelling Soil Erosion and Sediment yield at a catchment scale: the case of Masinga catchment, Kenya. *Journal of Land Degradation and Development*. John Wiley & Sons, 54(17): 557-570 DOI 10.1002/ldr.753.
36. **Mutua, B.M.** and Maina-Gichaba, C. (2006). Effect of land Use Change on Hydrological Regime in a Rural Catchment: A case of River Njoro Catchment, Kenya. *Journal of Soil Physics and Rural Water Management*, 4(2): 137-142.

2005: Selected Scientific Articles Published in Refereed Journals

37. **Mutua, B.M.**, Klik, A. and Loiskandl, W. (2005). Predicting Sediment Loading into Reservoir and its Storage Capacity Reduction. *Journal of Water Management and Hydraulic Engineering* 2005, 12(3): 159-168.

2004: Selected Scientific Articles Published in Refereed Journals

38. **Mutua, B.M.** and Klik, A. (2004). Soil erosion management at a large catchment scale using the RUSLE-GIS: The case of Masinga catchment, Kenya, *Journal of Management of Information Systems (MIS)*, 32: 287-296.

2001: Selected Scientific Articles Published in Refereed Journals

39. **Mutua, B. M.** and Malano, H. M. (2001). Analysis of manual and centralised supervisory control operations to improve level of service: a case study of Pyramid Hill No 1 Channel, Victoria, Australia, *Irrigation and Drainage Systems*, 15: 1-19.

2012-2016: Articles submitted, under review or accepted in refereed Journals

40. **Benedict M. Mutua**, Francis Musyoka and George Orina. (2016). Prediction of Missing Hydro-Meteorological Data Series using Artificial Neural Networks (ANN) for ungauged River basins in Kenya. (Submitted to *Advances in Water Resources Journal*).
41. **Mutua, B.M.**, Nata, T. and Loiskandl, W. (2015). Integrated water resources management at river-basin scale: The case of Awash basin, Ethiopia (Under review in *Journal of Applied Research in Water Resources Management*).
42. Raphael M. Wambua, **Benedict M. Mutua** and James M. Raude. (2015). Detection of drought-risk areas using trends of spatial and temporal drought characteristics in upper Tana River basin, Kenya. Paper submitted for publication in the *Journal of Hydrological Sciences*.
43. Raphael M. Wambua, **Benedict M. Mutua** and James M. Raude. (2015). Assessment of spatio-temporal drought characteristics using SPI drought index for upper Tana River basin, Kenya. Paper submitted for publication in the *Journal of Water Resources Management*.
44. **Mutua, B.M.** and Gichaba-Maina, C. (2014). Supporting operational catchment-management through GIS-enabled prediction of flow-regimes on ungauged rivers. The case of Turkwel River (submitted in the *Journal of Spatial Hydrology*).
45. **Mutua, B.M.** and Mwangi, J. (2014). Mapping groundwater recharge and discharge zones in the arid and semi-arid areas of Kenya: A remote sensing approach (Under review in the *Journal of Hydrology*).
46. Mwetu, K. K., **Mutua, B. M.**, Loiskandl, W., Fürst, J. F. & Yillia, P.T. (2014). Monitoring land use and land cover change using time series of satellite images for a rural catchment in Kenya, *Physics and Chemistry of the Earth* (Article currently under peer-review).
47. Kirui, W., **Mutua, B.M.** and Onyando, J.O. (2014). Evaluation of trends and effects of land cover changes on stream flow and runoff generation (submitted in the *International Journal of Geographical Information Science*).
48. **Mutua, B.M.** and Gichaba-Maina, C. (2014). Human induced effects on flow regimes: The case of Turkwel River, Kenya (submitted in the *Journal of Hydrology*).
49. Kyambia, M. M., Onyando, J. O. and **Mutua, B. M.** (2013). Predicting Design Storms for Basin Conservation Planning in Lake Naivasha Basin, Kenya, (Accepted to be published in the *Journal of Land Degradation and Development*).
50. Kirui, W. K., **Mutua, B.M.** and Onyando, J.O. (2013). Effects of land degradation on catchment hydrologic response: A Case of upper Molo River Catchment, Kenya (Under review to the *International Journal of Water Resources and Environment*).

21. Selected Publications in Peer-reviewed Conference Proceedings:

2010-2015: Publications in Peer-reviewed Conference Proceedings

1. **Benedict M. Mutua** and Willbold Loiskandl. (2015). Application of ArcSWAT model in Modelling the impact of Climate Change on River Flow Regimes in the Upper Tana River basin, Kenya. Paper presented at the 34th International Conference on Water Resources Management in Large River basin held in Vienna on 7th to 9th April 2015.
2. **Benedict M. Mutua**, Willbold Loiskandl and Andreas Klik. (2015). Calibrating ArcSWAT model for Large River Basins. International Conference on Modelling for Water Resources Management held in at the Kiel University, German on 10th to 13th February 2015.
3. Raphael, M. Wambua, **Benedict M. Mutua**, and James M. Raude. (2015). Drought forecasting under climate change scenarios using artificial neural networks for sustainable water resources management in upper Tana River basin, Kenya. Paper presented at International Conference e held in Dresden NEXUS Conference, United Nation University, DNC2015 on 25th to 27th March 2015.
4. Lechner, M., **Mutua, B.M.**, Pressl, A., Ketema A.A., Meinold, K., Casielles, R., Naidoo, V., Coulibaly, Y., Mahi, M., Fontessa, T.D., Langergraber, G. (2014): The CLARA Simplified Planning Tool, In: *Proceedings of 12th IWA Specialized Conference on Small Water and Wastewater & 4th IWA Specialized Conference on Resource Oriented Sanitation*, Thanikal, J.V., Torrijos, M. (eds), Muscat, Oman, pp.31-33.
5. Lechner, M., Pressl, A., Ketema A.A., Meinold, K., Casielles, R., **Mutua, B.M.**, Naidoo, V., Dissa, A., Jaait, M., Dalecha, T., Langergraber, G. (2014): A tool to compare life-time costs of water supply and sanitation systems, In: *Book of Abstracts of 2nd IWA Spezialized International Conference on "EcoTechnologies for Wastewater Treatment (ecoSTP2014)"*, Canziani, R., Fatone, F., Katsou, E. (eds.), Verona, Italy, pp 63.
6. **Mutua, B.M.** and Gacheiya, R.M. (2014). *Development of a Simplified Planning Tool for Integrated Water Supply and Sanitation Systems for Njoro Township, Kenya*. Proceedings of the 8th Egerton University International Conference in conjunction with WEDC, UK held on 26th to 28th March 2014 at Egerton University.
7. Kyambia, M.M. and **Mutua, B.M.** (2014). *Predicting Design Storms for Basin Conservation Planning in Lake Naivasha Basin, Kenya*. Proceedings of the 8th Egerton University International Conference in conjunction with WEDC, UK held on 26th to 28th March 2014 at Egerton University.
8. Kyambia, M.M. and **Mutua, B.M.** (2014). *Analysis of Drought Effect on Annual Stream flows for River Malewa in the lake Naivasha Basin, Kenya*. Proceedings of the 8th Egerton University International Conference in conjunction with WEDC, UK held on 26th to 28th March 2014 at Egerton University.
9. Dalecha, T., Assefa, E., Ketema, A.A., Weissenbacher, N., Krasteva, K., Lechner, M., Müllegger, E., Casielles, R., Feki, F., **Mutua, B.M.**, Naidoo, V., Dissa, A., Jaait, M., Langergraber, G. (2013): Capacity-Linked water supply and sanitation improvement for Africa's peri-urban and Rural Areas (The CLARA project). In: *Proceedings of International Conference on Science and Technology towards the Development of East*

Africa (ICST-2013), Gabbiye, N., Kaba, E., Manocha, B.L., Singh, K.K., Sharma, S. (eds.), Institute of Technology, Bahir Dar University, Bahir Dar, Ethiopia, pp.311-318.

10. **Mutua, B.M. (2012)**. *Enhancing collaboration on Water Technologies: An overview of the EC FP6 and FP7 funded projects*. Paper presented during the 12th International Conference on the Water Challenge - Every Drop Counts, held from 22nd to 25th May 2012 in Brussels, Belgium.
11. Raude, J.M., Maina, C.W. and **Mutua, B.M. (2012)**. *Performance evaluation of ecological Sanitation Systems in Nakuru*. Paper presented during the Ecosphere Technologies Envirosan Sanitation Solutions. Global Dry Toilet Associated of Finland. Conference held from 21st to 24th August 2012 at the Holiday Inn Hotel, Yliopistonkatu 44.
12. **Mutua, B.M.** and Gacheiya, R.M. (2011). *Implementing ecological sanitation as a means towards decentralized wastewater treatment, the case of peri-urban areas in Nakuru Municipal Council, Kenya*. Paper presented during the *Smallwatt 11* 3rd International Congress held at the Hotel Barceló Renacimiento, Seville Spain from 25th to 28th September 2011. Theme: Wastewater in Small Communities Towards the Water Framework Directive (WFD) and the Millennium Development Goals (MDGs).
13. Maina, C.W., **Mutua, B.M.** and Oduor, S.O. (2011). *Treatment Efficiencies for Constructed Wetland using Vetiver Grass as a Wetland Plant*. Paper presented at the 6th Egerton University Research Week and International Conference held at the ARC Hotel, Egerton University Kenya from 21st to 23rd September 2011.
14. Raude, J.M., **Mutua, B.M.** and Kamau, D.N. (2011). *Analysis of Treatment Dynamics of Subsurface Flow Constructed Wetlands in Treatment of Greywater*. Paper presented at the 6th Egerton University Research Week and International Conference held at the ARC Hotel, Egerton University Kenya from 21st to 23rd September 2011.
15. Kyambia, M.M., **Mutua, B.M.** and Onyando, J.O. (2011). *Time Series Analysis of Extreme Stream flows in Lake Naivasha using Statistical Parameters Method*. Paper presented at the 6th Egerton University Research Week and International Conference held at the ARC Hotel, Egerton University Kenya from 21st to 23rd September 2011.
16. Mwetu, K. K., **Mutua, B.M.**, Loiskandl, W., Furst, J. & Yillia, P.T. (2010). Monitoring land use and land cover change using time series of satellite images for a rural catchment in Kenya. (Submitted to *Elsevier Editorial System(tm) for Physics and Chemistry of the Earth*). Special Issue: 10th Waternet.
17. Mwetu, K.K., **Mutua, B.M.** and Loiskandl, W. (2010). Linking stakeholders to catchment hydrology: Control and management of impacts of climate and land cover change on the hydrology. In: Natural Resources 2010 Conference Proceedings held on 25-27 October 2010 in Hannover, Germany.
18. Mwetu, K.K., Wambua, R.M and **Mutua, B.M. (2010)**. Assessment of land cover and climate change impacts on the hydrology, a case study of East Mau catchment in Kenya. In: 2010 Kenya's International conference Proceedings on biodiversity, land use and climate changes, held on 15-17 September, 2010, Nairobi, Kenya.

2009: Publications in Peer-reviewed Conference Proceedings

19. Mwetu, K. K., **Mutua, B. M.**, Kundu, P. M., Fürst, J. and Loiskandl, W. (2009). *Effects of deforestation and climate variability on river discharge in the Njoro River catchment, Kenya*. In: Semenye, P. P.; Mondob, H. O. (Eds.), Proceedings of the SUMAWA Mau Forest Complex Conference, pp 99-111. Egerton, Kenya; ISBN: 9966-05-180-5 [SUMAWA Mau Forest Complex Conference, Egerton University, APR 27-29, 2009].
20. **Mutua, B.M.** (2009). *Towards the development of simplified technologies on Sanitation Systems for small communities*. The 4th International Conference on Sanitation and Hygiene for small communities in developing countries held at the Loughborough University, UK from 19th -23rd October 2009.
21. **Mutua, B.M.** (2009). *Implementation of sustainable sanitation services in peri-urban and urban areas in sub-Saharan Africa*. Presented during the 7th International Workshop on Water, Sanitation, Hygiene and Education WASHE, in Geneva, Switzerland from 14th - 19th September 2009.
22. Mwetu, K. K, Kundu, P. M, **Mutua, B. M.**, Fürst, J. and Loiskandl, W. (2009). *Response of river flow regime to land-cover and climate change in Njoro River Catchment, Rift Valley Province in Kenya*. In: Kovar P, Maca P, Redinova J, Eds, Water Policy 2009 Water as a Vulnerable and Exhaustible Resource ; ISBN: 978-80-213-1944-8.
23. Wambua, R. M. and **Mutua, B. M.** (2009). Assessment of land resources degradation Proceedings of the international conference, held at ARC, Egerton University, September 15th -17th 2009.
24. Gacheiya, R. M. and **Mutua, B.M.** (2009). *Sanitation challenges in learning institutions: The case of Nakuru Municipality, Kenya: Water, Sanitation and Hygiene: Sustainable Development and Multisectoral Approaches*; 34th WEDC International Conference, Addis Ababa, Ethiopia. 18-22 May 2009.
20. Ojwando, K.O. and **Mutua, B.M.** (2009). *Water, sanitation and hygiene: sustainable development and multisectoral approaches*. Proceedings of the 34th WEDC International Conference, United Nations Conference Centre, Addis Ababa, Ethiopia, 18-22 May 2009.
21. Langergraber, G., Meinzingler, F., Lechner, M., G. de Brujne g., Sugden, S., Niwagaba, C.B., Kimaro, T.A., **Mutua, B.M.**, Kassa K., Komakech, R., Kimani, S.N., Kinyange, P. and Ayele, W. (2009). *Implementation of sustainable sanitation in Eastern African Cities – the ROSA approach*. Proceedings 2009, Twelfth International Waste Management and Landfill Symposium S. Margherita di Pula, Cagliari, Sardinia, Italy; 5 - 9 October 2009. ISBN 978-88-6265-007-6.

2006 - 2008: Publications in Peer-reviewed Conference Proceedings

22. **Mutua, B.M.** (2008). ROSA Project, Nakuru Kenya. At Ouagadougou, Burkina Faso, NETSSAF, International. Conference 24th – 27th September, 2008.
23. **Mutua, B.M.** (2008). *Sustainable Sanitation in Peri-Urban areas in Kenyan Municipals Councils*. International Conference on Sanitation and Hygiene, AfricaSan 2008 held at Internal Convention Centre, Durban South Africa 18th – 20th February 2008.
24. Mwetu, K. K., **Mutua, B. M.**, Kundu, P. M., Fürst, J. and Loiskandl, W. (2008). *Spatial-temporal land cover mapping using imagery in River Njoro catchment, Kenya*. In: ESRI

(Eds.), Proceedings 3rd ESRI Eastern Africa User Conference (EAUC), Nairobi, Kenya. [3rd ESRI Eastern Africa User Conference (EAUC), Nairobi, OCT. 23-24, 2008].

25. Langergraber, G., Meininger, F., Lechner, M., de Brujne, G., Sugden, S., Niwagaba, C.B., Mashauri, D., **Mutua, B. M.**, Teklemariam, A., Achiro, I., Kiarie, S.C., Laizer, J.T. and Ayele, W. (2008). *The ROSA project – A new approach to sustainable sanitation in Eastern African cities*. In: Proceedings of the 6th IWA World Water Congress, 8-12 September 2008, Vienna, Austria; (CD-ROM, paper 664279).
26. Wambua, R. M., Kimani, P. K., **Mutua, B. M.** and Nyaanga, D.M. (2007). *Spatially Distributed Event-Based Runoff, Sediment Yield and Soil Erosion within Catchments: The Case of Upper Njoro River Catchment*-Proceedings of the international conference, Egerton University, ARC, July, 2007.
27. **Mutua, B.M.** and Gichaba, C.M. (2006). *Effect of land use change on hydrological regime in a rural catchment: A case of River Njoro Catchment, Kenya*. SOPHYWA International Symposium 28-29th September 2006 BOKU, Vienna Austria.

2004-2005: Publications in Peer-reviewed Conference Proceedings

28. **Mutua, B.M.** and Klik A. (2005). *Modelling soil erosion impacts under different land use and Management practices at a large scale catchments* In: Heidrun Mühle, Burghard, C, Meyer: International conference on sustainable Land Use in Intensively used agricultural regions, 20.-22.9.2005, Leipzig, Germany, pg 77.
29. **Mutua, B.M.** and Klik A. (2005). *Modelling spatial sediment yield at a large scale rural sediment yield at a large scale rural catchment*. In: Jerzy Rejman: International symposium COST 634 on On- and Off-site Environmental Impacts of Runoff and Erosion, 15-17.9.2005, Lublin, Poland, pg 30.
30. **Mutua B.M.**, Klik A. & Loiskandl W. (2005). *Predicting sediment loading into Masinga Reservoir and its storage capacity reduction*. In: Universität für Bodenkultur: 9th Symposium on Water Management and Hydraulic Engineering, 4.-7.9.2005, Ottenstein/Austria, S., pg 159.
31. **Mutua B.M.** and Klik A. (2004). *Application of Rusle-Gis in mapping spatial soil erosion in a large rural catchment in kenya*. In: Ivana Ticha: Sustain Life Secure Survival II, Socially and Environmentally Responsible Agribusiness, 22.-25.9.04, Prag, pg 101.
32. **Mutua, B.M.** and A. Klik. (2004). *Soil erosion management at a large catchment scale using the RUSLE-GIS: the case of Masinga catchment, Kenya*. In: Brebbia: Management Information Systems 2004: Incorporating GIS and Remote Sensing, 13.-15.September 2004, Boston, 287-296; ISBN 1-85312-728-0.

22. Selected Technical and Scientific Reports:

2010: Technical Scientific Reports

1. Langergraber, G., Weissenbacher, N., Ayele Shewa, W., Kassa Ayano, K., Meininger, F., Gacheiya, R. M., **Mutua, B. M.**, Tendwa, O. M., Kimaro, T.A., Müllegger, E., Freiburger, E., Schreiner, S., Moseti, Y. and Lechner, M. (2010). *The ROSA project. EcoSan Club*. [2.28 MB].

2. Muchiri, E.W., Muellegger, E. and **Mutua, B.M. (2010)**. Private sector involvement in operating urine diverting dry toilets in Nakuru, *Sustainable sanitation practice* Vol. 2 <http://www.ecosan.at/spp/issue-2-operation-maintenance/article-4/view>.
3. Muchiri E.W. and **Mutua, B.M. (2010)**. Pilot UDD Toilets at a church and nursery school in Nakuru, Kenya. *Sustainable Sanitation alliance (SUSANA)* http://www.susana.org/docs_ccbk/susana_download/2-127-en-cs-rosa-uddt-churchandnurseryschoolsusana.pdf.
4. Muchiri E.W., Raude J.M. and **Mutua, B.M. (2010)**. *Pilot UDD toilets and grey water treatment systems at Crater view secondary school in Nakuru, Kenya.* http://www.susana.org/docs_ccbk/susana_download/2-125-en-cs-rosa-uddt-craterviewsecondaryschool-susana.pdf.
5. Muchiri E.W. and **Mutua, B.M. (2010)**. *Pilot UDD Toilets at a residential plot in Nakuru, Kenya.* Sustainable Sanitation alliance (SUSANA). http://www.susana.org/docs_ccbk/susana_download/2-115-en-cs-rosa-uddt-residentialsusana.pdf.

23. Post Graduate Supervision:

2009-2016: Ph. D Theses Supervised and students graduated

1. Delbari Masoomah. PhD. Thesis (2009): Title: “*Using sequential Gaussian simulation to assess the field-scale spatial uncertainty of soil water content*”. PhD Thesis at the Institute of Hydraulics and Rural Water Management, Universität für Bodenkultur (BOKU), Vienna.
2. Mwetu, Kennedy Kitonga. PhD. Thesis (2010): Title: “*Modeling responses of hydrology to Land use/Land cover change and climatic variability: A case study in River Njoro catchment of Kenya*”. Dissertation am Institut für Hydraulik und landeskulturelle Wasserwirtschaft; Universität für Bodenkultur (BOKU), Wien.
3. Raude, J. M. PhD. Thesis (2013): Title: “*Hydraulic Performance of Horizontal Subsurface Flow Constructed Wetland System in Treatment of Greywater: The Case of Peri-Urban Areas in Nakuru Municipality, Kenya*”.
4. Ashetu, T. B. PhD. Thesis (2014): Title: “*Application of selected Global Climate Models (GCMs) to analyse climate change impacts on the spatial and frequency patterns of drought using a potential drought hazard mapping approach: A case of Amhara Region, Ethiopia.*”
5. Terauk, J.O. M. PhD. Thesis (2015): Title: “*Modeling Sediment Transport and River Bed Evolution in River System, Spain*”
6. Nicole, F.S. PhD. Thesis (2016). “*Hydraulic modeling of flow, water levels and inundations: Serein River case study, France*”.

2007- 2016: MSc. Theses Supervised and students graduated

1. Raude, J.M. MSc. Thesis (2007). Title: “*Surface Runoff and Soil Loss under varying Rainfall Intensity in Selected Land Use Practices from River Njoro Catchment-Kenya.*”

2. Kirui, W. K. MSc. Thesis (2008). Title: *“Evaluation of trends and effects of land cover changes on stream flow and runoff generation: The case of upper Molo catchment, Kenya”*.
3. Wambua, R. M. MSc. Thesis (2008). Title: *“Determination of Spatial Distribution of Runoff and Sediment Yield within Njoro Catchment, Kenya”*.
4. Laura, K. MSc. Thesis (2009). Title: *“Characterisation of Greywater from Peri-urban areas in Nakuru, Kenya”*. Title: *“Characterisation of Greywater from Peri-urban areas in Nakuru, Kenya.”*
5. Odongo, V. O. MSc. Thesis (2010). Title: *“Evaluating the MUSLE Model for Sediment Yield Prediction for upper Malewa River Catchment in Kenya”*.
6. Maina, C.W. MSc. Thesis (2011): Title: *“Evaluating the Hydraulic Performance Of Vertical Flow - Constructed Wetland System In Effluent Polishing”*.
7. Atambo, D. O. MSc. Thesis (2012): Title: *“Prediction and Determination of Sediment Deposition in Irrigation Canals: A Case study of Katilu Irrigation Scheme Turkana South District, Kenya”*.
8. Kyambia, M. M. MSc. Thesis (2012): *“Title Characterization of the Trends in Hydrological Extremes for Adaptation Planning to Climate change.”*
9. Mkaya, D. M. MSc. Thesis (2013): Title: *“Evaluation of the Impact of Land Use Change on Catchment Hydrology: The Case of Wundanyi River Catchment in Taita Hills, Kenya”*.
10. Kariuki, K.A.W. MSc. Thesis (2014): Title: *“Optimization of Intermittent Sand Filter for Treatment of Effluent from Sugar Factory.”*
11. Kyra, B. MSc. (2015): Master International Development Studies, University of Amsterdam. Title: *“Stranded Resources in the Context of Inclusive Development: A Multi-Layered Research with a Focus on Kenya”*.
12. Imbenzi, J. S. MSc. (2015): Title: *“Hydraulic Analysis of Thiba Main Canal Reach in Mwea Irrigation Scheme, Kenya”*.
13. Makenzi, M.M. MSc. (2015): Title: *“Degradation analysis of photovoltaic modules operating under Local Conditions”*.
14. Herut, M.A. MSc. (2016): Thesis Title: *“Analysis of drought in the region of Awassa Basin, Ethiopia using the Standardized Precipitation Index”*.
15. Theuri, C.K. MSc. (2016): Thesis Title: *“Application of HEC-RAS model in optimizing canal operational procedures”*.

2013-2016: Ph. D Theses under External Examinations

1. Wambua, R.M. PhD. (2014): *“Drought Assessment and Forecasting using Artificial Neural Networks for the Upper Tana River Basin, Kenya”* Registered at Egerton University, Kenya.

2. Mwangi, J.M. PhD. (2014): Title: “*Estimation of long term Soil Moisture using a Distributed Parameter Hydrologic Model and verification using Remotely Sensed Data: A case of Lake Baringo Basin*”. Registered at the University of Ancona, Italy.

2012-2016: PhD and MSc. Theses drafts being examined by Supervisors

1. Njeru, P. N. MSc. (2014): Title: “*Determination of the Optimum Design conditions of a small scale Irrigation system’s settling basin*”.
2. Odhiambo, J. O. D. PhD. (2013): Title: “*Optimizing Human Waste Treatment and Bio-Resource Recovery using a Hybrid Multi-Port Reactor*”. Registered at Egerton University, Kenya.
3. Muiruri, M. MSc. (2013): Thesis Title: “*Spatial Modeling for soil erosion and sediment yield delivered to reservoirs using Geowep model: The case of Sasumua Catchment, Nyandarua County, Kenya*”.
4. Kanda, M. MSc. (2013): Title: “*Evaluation of effects of Land use change on Surface Runoff, total phosphorous and total nitrogen at the Upper Ewaso Nyiro South Catchment, Kenya*”.
5. Lolmingani, P. MSc. (2012): Title: “*Simulation of Water Flow Distribution System using EPANET Model: A case study of Water Distribution Network in Maralal, Kenya*”.

2014-2016: MSc and PhD Proposals on-going

1. Lokwaliwa, M.A. MSc. (2014). Title: “*Changes in evapotranspiration and its impacts on water resources availability in the Njoro River catchment, Kenya*”.
2. Omulo, T. O. MSc. Proposal. (2015): Title: “*Agricultural Drought Monitoring using Satellite based and Hydro-meteorological data in Lake Baringo Drainage Basin, Kenya*”.
3. Kambombe, O. C. MSc. Proposal. (2016): Title: “*Application of ArcSWAT Model to Assess the Impact of Climate Change and Land use/land cover on Stream Flow- Case of Phalombe River basin, Malawi*”.
4. Musyoka, F.M. MSc. Proposal. (2016): Title: “*Impact of Climate Change on the Hydropower Generation in the Seven Folk Dams, Upper Tana River Basin, Kenya*”.
5. Onyancha, G.O. MSc. Proposal. (2016): Title: “*Application of WEAP Model in Allocating Water Resources in the Upper Nzoia River Basin, Kenya*”.
6. Maina, C.W. PhD. Proposal. (2015): Title: “*Analysis of Soil Erosion and Reservoir Sedimentation for Sustainable Catchment Management: A Case Study of Lake Naivasha and Thika Dam*”.
7. Kyambia, M. K. PhD. Proposal. (2016): Title: “*Application of ArcSWAT Model in Assessing and Predicting the Impact of Land use/Land Cover and Climate Changes on Water Resources for Ungauged River Basins- Case of Athi River Basin in Kenya*”.
8. Chelangat, G.T. PhD. Proposal. (2016). “*Impact of Climate Variability on Catchment Hydrology and Ecosystem Services: Case of Mara River Catchment, Kenya*”.
9. Akivaga, E. PhD Proposal. (2016). “*Assessing the Impact of Climate Variability in the Context of Water-Energy Nexus: Case of Tana River basin, Kenya*”.

10. Ngugi, H. N. PhD Proposal. (2016). *“Modeling Flash Floods Propagation Characteristics and Mitigation Measures in Narok Town, Kenya”*.

24: Recently Externally Examined MSc and PhD Theses:

1. Masuud, W.M. MSc. Thesis (2015). *“Design and implementation of controlled irrigation system powered by solar energy in the arid and semi-arid areas in Tonga basin, Tanzania”*.
2. Tena-Eshetu, P.T. PhD. Thesis (2015). *“Application of ArcSWAT model using point hydrological and global data in determining the impact of Climate variability on water resources within the Awassa basin, Ethiopia”*.
3. Senteu July Seema, MSc. Thesis (2014): *“optimisation of a hybrid tropical domestic wastewater constructed wetland for nitrogen transformations and removal using a dynamic simulation model”*.
4. Niwagamba, C.N. PhD. Thesis (2015). *“Application of ICT in planning, operation and management of water supply services in fast-growing small towns: A case of Kitugum Township in Northern Uganda”*.
5. Ndiiri, J.A. PhD. Thesis (2014). Comparison of water savings of paddy rice under system of rice intensification (SRI) growing rice in Mwea, Kenya.
6. Siringi Daniel Ogwoka, PhD. Thesis (2014): *“Remediation and optimization of chicken processing plant wastewater treatment by electrocoagulation”*.
7. Otieno, J. O.O. PhD. Thesis (2013): *Evaluation of CFSR Climate data for Hydrologic Prediction in data-scarce Watersheds: An Application in the Blue Nile River Basin”*.

25. Additional Professional Responsibilities:

1. External Examiner for both Undergraduate and Postgraduate students at:
 - (i) Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya (2010 – 2015)
 - (ii) South Eastern University of Kenya (SEKU), Kenya (2011 to date)
 - (iii) External Examiner for PhD and MSc Theses in many Universities (2007 to date)
2. Reviewer/Editor of refereed Journals for:
 - (i) Editor, Egerton Journal for Science and Technology (2014 to date)
 - (ii) International Journal of Land Degradation and Development (2006 –to date)
 - (iii) Journal of Spatial Hydrology (JOSH) (2006-2014)
 - (iv) Journal of Water Resources Management (WARM) (2008-to date)
 - (v) Journal of Sustainable Research in Engineering (JSRE) (2008 to date)
 - (vi) Journal of Water, Sanitation and Hygiene for Development (2009 to date)
3. External Academic Programme Peer Reviewer
 - (i) South Eastern University of Kenya (SEKU) (2009 to date)
 - (ii) Pan African University at Tlemcen, Algeria (2015 to date)

26. Outreach Professional work and Community Service:

1. Developed a Simplified Planning Tool for Integrated Water and Sanitation Systems for Njoro Township. This is a planning tool to be used by Town Water Engineers, Planners

and Consultants for designing sustainable water and sanitation systems for Njoro and other townships. This was done from the CLARA Project funds (2011-2014).

2. Prepared a short Course and trained the Water Engineers, Planners and Consultants from Within Nakuru and Baringo Counties on the use of the Simplified Planning Tool for Integrated Water and Sanitation Systems
3. (i) Designed and implemented water and sanitation systems for Schools in Nakuru and Baringo Counties (2006-2015).

(ii) Designed and implemented innovative Urinals for girls, Urine Dry Diverting Toilets (UDDTs) for Schools (2006-2015).

(iii) Developed and prepared a comprehensive participatory Strategic Sanitation & Waste Plans (SSWPs) for the then Nakuru Municipal Council. This was done from the ROSA Project funds (2006-2010).

(iv) Prepared a Collaborative Support Programme to enhance *Schools' Sustainable Water, Sanitation, Hygiene and Education*. This is being funded by S::CAN, Austria (2010-todate).

27. Current and Past Committees and Other Responsibilities:

- i. Chairman, Faculty of Engineering and Technology Postgraduate Committee
- ii. Member, Egerton University Building, Planning and Development Committee
- iii. Chairman, Maintenance and Decoration Graduation Sub-Committee
- iv. Chairman, Consultancy and Coordination Committee
- v. Member, Egerton University Publication Committee
- vi. Chairman, Egerton University Research and Consultancy Overheads Committee
- vii. Member, Egerton University Innovation and Linkages Committee
- viii. Member, Egerton University Budget Committee
- ix. Member, Egerton University Botanic Garden
- x. Member, Egerton University Corruption Prevention Committee (CPC)
- xi. Team Leader of the Community outreach and Capacity Building in Nakuru County on Integrated Water Supply and Sanitation
- xii. Member, Scientific Proposal and Manuscript reviewer at Egerton University
- xiii. Member, Faculty of Engineering and Technology Management Board
- xiv. Member, Faculty of Engineering and Technology Board of Examiners
- xv. Member, School Board of Governors, Ngongoni Secondary School, Migwani West District (Kitui County)
- xvi. Chairman, Nakuru Christian Centre Men Fellowship, Nakuru County

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