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**UNIVERSITY OF NAIROBI**

**DEPARTMENT OF EARTH AND CLIMATE SCIENCES**

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**DEPARTMENT OF EARTH AND CLIMATE SCIENCES ANNUAL REPORT 2021/2022**

**JUNE 2022**

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# INTRODUCTION

The Department of Earth and Climate Sciences is a fusion of the former departments of Geology and Meteorology, both of which have a very long and rich history since the University of Nairobi was established in 1970 (and Geology was established even earlier, in 1956 when the University of Nairobi was still the Royal Technical College of East Africa), as well as hosts and administers two relatively younger but very vibrant research institutes - the Institute for Climate Change and Adaptation (ICCA, est. 2011) and the Wangari Maathai Institute for Peace and Environmental Studies (WMI, est. 2009). The Department’s headquarters are in the Wangari Maathai Institute which occupies 50 acres of beautifully landscaped land within the Upper Kabete area of Nairobi.



Figure 1: A photo of Wangari Mathai Institute (Google images, 2018)

The department has a significant pool of highly trained and skilled professionals in the field of geology, meteorology, environment and climate who have continued to play a significant role in the Kenya’s development and beyond. Due to the inter- and trans-disciplinary nature of the programmes, the alumni of the department are employed in all sectors of the economy. The department aspires to be a centre of international repute committed to scholarly excellence in earth and climate sciences and its interface with society, policy and practice. Our vision is to provide dynamic leadership in the teaching, research, innovation, and consultancy and outreach services for the benefit of humanity, the planet and its diverse resources and ecosystems, and sustainable development.

As part of its mandate in teaching and training, the department offers a several undergraduate and postgraduate programmes, which you can explore further in this website. In support of these various programmes, the department has a suite of laboratories and Remote Sensing-GIS workspaces as well as climate and earthquake monitoring stations that are manned by highly qualified technologists as well as administrators who ensure that our students have a smooth, rich and satisfying experience as they undertake their degree programmes at all levels. We have over 1000 undergraduate students and close to 500 postgraduate students who are carrying out diverse and very interesting research projects at masters and doctoral level. We also have postdoctoral fellows who are associated, particularly through the ICCA and WMI-PES, with the many research projects and related industry, community and outreach programmes that are administered in the department.

We place a lot of emphasis on practical aspects which are embedded within the programmes, and, in addition, internship opportunities are particularly available to undergraduate and masters students during the semester breaks.

# PROGRAMMES OFFERED

Three undergraduate courses were offered in the Department during the period under review. However, due to low enrolment, the petroleum geoscience programme has been archived. The courses offered by the various thematic areas are listed below. ICCA and WMI offers training at post-graduate level only.

1. Bachelor of Science (Geology)
2. Bachelor of Science (Petroleum Geoscience)
3. Bachelors of Science (Meteorology)

Seventeen master’s degree programmes are offered under the four thematic areas. These are:

1. MSc. Meteorology
2. MSc Aviation Meteorology
3. MSc. Agrometeorology
4. MSc. Climate Change
5. MSc. Geology (Mineralogy & Petrology)
6. MSc. Geology (Mineral and Geothermal Resources)
7. MSc. Geology (Environmental Geology and Management)
8. MSc. Geology (Engineering Geology)
9. MSc. Geology (Hydrogeology & Groundwater Resource Management
10. MSc. Geology (Petroleum Geology)
11. MSc. Geology (Marine Geology & Resources)
12. MSc. Geology (Applied Geochemistry)
13. MSc. Geology (Applied Geophysics)
14. MSc. Geology (Seismology)
15. MSc. Geology (Palynology and Micropalaeontology)
16. MSc. Geology
17. MSc. Climate Change Adaptation
18. MSc. Environmental Governance

Four doctoral programme are offered by the four thematic areas. These courses are:

1. PhD in Geology
2. PhD in Meteorology
3. PhD Climate Change Science
4. PhD Climate Change Adaptation
5. PhD in Environmental Governance and Management.

One short course is offered by the WMI

1. Environmental Impact Assessment and Environmental Audit Training

# NUMBER OF STUDENTS (MALES AND FEMALES) PER PROGRAMME

During the period, the Department had an undergraduate population of 462 students, 67 Master of Science students, 12 doctoral students and 35 international students. During 2021 graduation ceremony, 121 students graduated with B.Sc. degrees in various programmes, 12 graduated with master’s degrees and 15 graduated with the doctor of philosophy degree. The breakdown of male and female enrolment and those graduated in 2021 in terms of various sections/units is given in tables 1a, 1b, 1c and 1d.

Table 1: Number of students enrolled in various disciplines in the Department of Earth and Climate Sciences during the 2021/2022 period

1. Undergraduate Courses

|  |
| --- |
| Total No. of Students |
| Year of Study | Male | Female |
| BSc. Geology |
| Year 1 | 61 | 17 |
| Year 2 | 54 | 10 |
| Year 3 | 37 | 10 |
| Year 4 | 51 | 16 |
| Total | 203 | 53 |
| BSc. Petroleum Geoscience |
| Year 1 | 0 | 0 |
| Year 2 | 12 | 1 |
| Year 3 | 3 | 3 |
| Year 4 | 2 | 1 |
| Total | 17 | 5 |
| BSc. Meteorology |
| Year 1 | 25 | 8 |
| Year 2 | 44 | 11 |
| Year 3 | 40 | 7 |
| Year 4 | 34 | 15 |
| Total | 143 | 41 |

1. Post graduate students

|  |
| --- |
| Post graduate students |
| Year of Study | Male | Female |
| Environmental governance |
| Msc. Year 1 | 1 | 3 |
| Msc. Year 2 |   |   |
| PhD | 3 | 1 |
| Climate change  |
| Msc. Year 1 | 6 | 3 |
| Msc. Year 2 | 7 | 2 |
| PhD |  3 |  1 |
| Climate change and adaptation |
| Year 1 | 12 | 9 |
| Year 2 | 13 | 8 |
| PhD | 3 | 2 |
| Geology |
| Year 1 | 1 | 1 |
| Year 2 | 3 | 2 |
| PhD  |   | 2 |
| Meteorology |
| Year 1 | 6 | 1 |
| Year 2 | 2 | 4 |
| PhD |  2 | 1 |

1. International students

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Reg No.  | Student Names  | Gender  | County  |
| I10-BACHELOR OF SCIENCE IN METEOROLOGY |
| 1 | I10/138547/2019 | Khumalo Zakhele Percival | M | Swaziland |
| I13-BACHELOR OF SCIENCE IN GEOLOGY |
| 2 | I13/102659/2017 | Latjor Chuol Gakah | M |  |
| 3 | I13/133519/2018 | Maringo Irene | M | Tanzania |
| 4 | I13/142294/2021 | Mohamed Sadia Abdikani | M | Somali |
| 5 | I13/143664/2021 | Osman Bila Hamza | M | Sudan |
| I15-BACHELOR OF SCIENCE IN PETROLEUM GEOSCIENCE |
| 6 | I15/100110/2017 | Liebo Pajwan Oyitjwok | M |  |
| I54-MASTER OF SCIENCE IN CLIMATE CHANGE |
| 7 | I54/39026/2021 | Dorbor-Soko Louise Mamie | M | Liberia |
| 8 | I56/12703/2018 | Ga'al Abdishakur Ahmed | M | Somali |
| 9 | I56/12746/2018 | Nur Yonis Ali Yusuf | M | Somali |
| 10 | I56/40872/2021 | Wilson Leo Klah | M | Liberia |
| I56-MASTER OF SCIENCE IN AVIATION METEOROLOGY |
| 11 | I56/40139/2021 | Oussoumana Boubacar | M | Niger |
| A60-MASTER OF SCIENCE IN ENVIRONMENTAL GOVERNANCE |
| 12 | A60/40839/2021 | Mugisho Mubalama Gilbert | M | D.R. Congo |
| I581-MASTER OF SCIENCE IN METEOROLOGY |
| 13 | I56/40433/2021 | Nassor Aisha Yahya | M | Tanzania |
| 14 | I56/40434/2021 | Kessy Wilfred Paulo | M | Tanzania |
| 15 | I56/40874/2021 | Yagoub Saeed | M | Sudan |
| 16 | I56/40875/2021 | Okau Patricia | M | Uganda |
| 17 | I56/40877/2021 | Yimam Yimer Assefa | M | Ethiopia |
| 18 | I56/40876/2021 | Koriom Samuel Thon Ayor | M | South Sudan |
| 19 | I56/41087/2021 | Gorbe Emmanuel Qurino Nijak | M | South Sudan |
| 20 |  | Musiba Musamba Musiba | M | Tanzania |
| I572-MASTER OF SCIENCE IN ENVIRONMENTAL CHEMISTRY |
| 21 | I56/41124/2021 | Ishimwe Mizero Francois | M | Rwanda |
| 22 | I58/35373/2019 | Safari Queen Kwindja | M | D.R. Congo |
| 23 | I58/36109/2019 | N'dakpaze Gno-Solim Ela | M | Togo |
| 24 | I58/37254/2020 | Kabwazi Mphanda Kabwazi | M | Malawi |
| 25 | I58/37507/2020 | Nimo Hassan | M | Somali |
| 26 | I58/40868/2021 | Abdullahi Fadumo Ahmed | F | Somali |
| 27 | I58/40869/2021 | Mohamed Muqtar Hersi | M | Somali |
| 28 | I58/41605/2021 | Demba Aboubakar | M | Cameroon |
| 29 | I58/41648/2021 | Bonifacio Aminu | M | Ghana |
| 30 | I58/41652/2021 | Akpoterai Lawrence Enejeta | M | Nigeria |
| 31 | I58/41654/2021 | Ndagire Stella | M | Uganda |
| 32 | I58/88954/2016 | Nyirenda Tamara Eunice | M | Malawi |
| I85-PH.D. IN CLIMATE CHANGE AND ADAPTATION |
| 33 | I85/57114/2020 | Lwasa James Henry | M | Uganda |
| 34 | I85/57269/2020 | Kangume Susan | M | Uganda |
| 35 | I85/57384/2020 | Muyama Eunice | M | Uganda |
| 36 | I85/57719/2020 | Chinoko Vitumbiko | M | Malawi |
| 37 | I85/58914/2021 | Teshome Sintayehu Alemayehu | M | Ethiopia |
| 38 | I85/59044/2021 | Najira Shamiso Nandi | M | Malawi |

1. No. of students who graduated in 2021

|  |  |
| --- | --- |
| **Programme** | **No. of Graduates** |
| **Undergraduate programmes** |
| BSc. Geology | 59 |
| BSc. Petroleum Geology | 3 |
| BSc. Meteorology | 59 |
| **Postgraduate programmes** |
| MSc. Climate Change | 2 |
| MSc. Agrometeorology | 1 |
| MSc. Climate Change Adaptation | 3 |
| MSc. Environmental Governance | 3 |
| MSc. Aviation Meteorology | 0 |
| MSc. Geology | 2 |
| MSc. Meteorology | 1 |
| PhD. Geology | 2 |
| PhD. Meteorology | 1 |
| PhD. Climate Change Adaptation | 9 |
| PhD. Environmental Governance and Management | 3 |

# RESEARCH ACTIVITIES UNDERTAKEN BY STAFF AND STUDENTS

During the 2021/2022 academic year, academic members of staff and postgraduate carried out scientific research in different research areas. Some research was through collaborative research grants programme with counterparts spread across the world. These grants were won through competitive proposals. Our masters and doctoral students undertake research through mentorship by their respective supervisors. Table 2 gives a summary of research work undertaken by both academic members of staff and the postgraduate students

Table 2: Research activities by members of staff and postgraduate students during the 2021/2022 academic year

1. Staff

|  |  |  |  |
| --- | --- | --- | --- |
| S/No. | STAFF RESPONSIBLE | RESEARCH/PARTNER INSTITUTION | Period |
| 1. | Prof. D. Olago | REACH is a seven-year global research programme led by Oxford University with University of Nairobi as one of its International Consortium of partners and with funding by UK Aid from the UK Government. The broad aim of the project was to improve water security for the poor by delivering world-class science that transforms policy and practice. It also aimed at strengthening human capacity. | 2015 -2024 |
| 2. | Dr. L. Olaka | Erasmus inter-university mobility between University of Barcelona and University of Nairobi. | 2020 - 2023 |
| 3. | Prof. E. OdadaDr. L. OlakaDr. D. Ichang’i | Evaluation of Artisanal Gold Mining Practice and Its Impact on Water Resources In Migori County, Kenya funded by British Geologic Survey, ODA | 2019 - 2021 |
| 4. | Prof. D. OlagoDr. C. OmuomboDr. L. Olaka | Mikoko project: Conservation and resilience of Kenya’s mangrove forests | 2019 - 2021 |
| 5 | Prof. D. OlagoDr. R. AyahDr. S. DuloDr. J Kanoti | AfriWatSan Project: Sustaining low-cost, urban water supply and sanitation systems in Africa. AfriWatSan is developing the scientific evidence to inform policies and practices sustaining low-cost, on-site water supplies and sanitation systems in urban Africa and to strengthen the capacity of individuals and institutions to conduct this vital research. | 2016 -March 2022 |
| 6 | Dr J. N. MutemiDr. W. GitauDr B. MutaiDr E. Bosire | GCRF Science for Weather Information and Forecasting Techniques (SWIFT) | 2017- 2021 |
| 7 | Dr. Stephen RwigiProf. Gilbert Ouma | Resilience, Factors, Capacity Building | 2020 to Date |
| 8 | Dr F. J. Opijah | DECIMALS (Developing Country Impacts Modelling AnaLysis for SRM) | 2021 to Date |
| 9 | Prof. G. Ouma | Building Research Capacity for Sustainable water and food security in drylands of sub-Saharan Africa (BRECcIA) | Ongoing |
| 10 | Dr. B. K. Mutai | Global Disaster Preparedness Center/American Red Cross: Temporal distribution of heatwave events and its concomitant effect of human health in Nairobi, Tana River, and Turkana in Kenya | April – Oct 2022 |
|  |  |  |  |
|  |  |  |  |

1. Student Projects (MSc and PhD)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S/No.** | **Reg. No** | **Name** | **Title of Dissertation** | **Research Supervisors** |
| **PhD** |
|  | I80/80081/2008 | Gladys Kianji | Seismic Hazard assessment for Kenya | Prof. J. Barongo, Prof. E. Mathu |
|  | I80/50015/2015 | Tabitha Wambui | Assessment of hydro geologic controls and impact of climate change on groundwater resources in the Ewaso Ngiro –Lagh Dera basin  | Dr. E DindiDr. Z. KuriaProf. D Olago |
|  | A82/52295/2017 | Lillian Sarah Namuma Kong’ani, | Role of Mediation in Resolving Project Implementation Conflicts for Sustainability: Case of Olkaria Geothermal Plant. | Prof R. Wahome, Dr. T.Thenya, |
|  |   | Wambua, Patricia Mumbi  | Impacts of Community Institutions in forest and water Governance- A case study of Kilungu forest, Kenya | Prof J. Muthama. Dr.T. Thenya |
|  | A82/52192/2017.  | Margaret W. Muriuki, | Impacts of Community Based Conservation Governance on Wildlife Population, Habitat changes and Community Development in Kalama conservancy, Kenya. | Dr. T. Thenya, Dr. J. Mutune |
|  | A82/52411/2017   | Kamugisha Marsiale, | Transformational Governance for food-secure rural households: Tapping the potential of waste-based agro- forestry in western Uganda | Dr. T. Thenya, Prof H.Mutembei |
|  |  A82/53551/2018  | Philip M. Muraguri | Evaluation Of Hand Washing Faucets Water Release Efficiency In Selected Public Access Places Within Nairobi County- | Dr. T. Thenya, Dr J.Muronge |
|  | A82/54351/2019  | Eluzai John Matata. | Challenges And Opportunities With Environmental Impact Assessment In Juba, South Sudan | Dr. T. Thenya, Dr. J. Muronge |
|  | A82/57399/2020   | Darlington S. Tuagben, | "Assessment of Stakeholders Involvement in Natural Resources Management of Mount Nimba Conservation Area of Liberia".  | Dr T. Thenya, Dr. R.Kibugi Dr. E.H. Shannon (University of Liberia) |
|  | A82/53602/2018 | Maureen Kwamboka | Assessment Of The Kenyan Cement Industry In Relation To The Green And Circular Industrial Ecology In Athi River Ward, Machakos County | Dr. T. Thenya, Dr. B. Kathambi |
|  | A82/55215/2019 | Emojong Mercy Amai | An Evaluation on Governance of Exploration And Exploitation of Seabed Resources: A Case Study of Kenya Jurisdiction | Dr. T. Thenya; Dr. A.Momanyi Dr. J.M. Githaiga |
|  | I80/52673/2018 | Jane Wangui Mugo | Modelling Green Gram Production in Kenya under the Current and Future Climates | Dr. J. N. NgainaDr. F. J. Opijah |
|  |  | Josphine Kirui | Investigating The Impact Of Fodder On Smallholder Milk Productivity In Nandi County, Kenya Under Changing Climate | Prof. N. J. MuthamaDr. J. N. NgainaProf. Gachuiri Charles K |
|  |  | Daniel Mbithi | Effect of land-based Black Carbon (BC) aerosols on Climate Change over Kenya | Prof. N. J. MuthamaProf. R. Omwonga |
|  |  | Anthony Musili Mwanthi | Land-Atmosphere Characteristics and their role in medium-Range rainfall Predictability over East Africa | Dr. J. N. MutemiDr F. J. OpijahProf. F. Mutua |
|  | I84/51126/2016 | Jully Odhiambo Ouma | Enhancing Pastoral Livelihood in Arid and Semi-Arid lands of Kenya under Climate Change | Prof. N. J. Muthama |
|  | I84/51132/2016 | Deng Paulino Omoj Omay |  | Prof. N. J. Muthama |
|  | I80/58564/2021 | Oundo Kizito Amua |  | Prof. A. OpereDr. F. J. Opijah |
|  | I80/59065/2021 | Ruth Waswa |  | Dr. F. J. OpijahProf. A. Opere |
| **Masters** |
|  | 185/58214/2021 | Evans Sitati | Assessing present and future livelihood and conservation threats at 2030 and 2063 with land use scenarios. A Case Study of the Maasai Mara Ecosystem |  |
|  | 185/58914/2021 | Sintayehu Alemayehu | Impact of climate change on land suitability, food security and conflict, and adaptations under changing climate and future projections in Ethiopia. |  |
|  | 185/59019/2021 | Calistus Wachana | Enhancing climate change adaptation through climate services co-production for farming communities of Trans Nzoia County |  |
|  | 185/59059/2021 | Abach Owino | Impact of Land Subdivision on People Livelihood and Climate Change |  |
|  | I85/59044/2021 | Najira Shamiso Nandi | Developing Adaptation Strategies for Key Agro ecological Zones in Malawi Using Crop Models and Local Indigenous Knowledge Systems and Practices (LIKSP). |  |
|  | A60/38524/2020 | Waiguchu M. Grace | Assessment of the spatial and temporal changes on sea grasses in the intertidal areas of Lamu, Kenya. Ongoing data collection | Dr. T. Thenya, Dr. J. Mutune, Dr J. Kairo (KEMFRI) |
|  | I56/ 38920/ 2020  | Ng’aari Jane Wambui  | Rift Valley Break up Across the Turkana depression: Focus on velocity trend and elevation change  | Ms. S. Stamps Ms. G. Kianji Dr. C. Gichaba |
|  | I56/37568/2020  | Bernard Sirma Koech  | The Seismicity and crustal; structure of the area around Baringo Using Seismic Methods  | Ms. G. Kianji Dr. A. Wamalwa  |
|  | A60/38660/2020  | Mathan Matheri | Environmental Governance of the Upstream Oil and Gas Industry Kenya: Assessing the Policy and Regulatory Preparedness to Mitigate Environmental Risk.  | Dr. K Muigua , Dr. T. Thenya |
|  | A60/38216/2020.  | Lotuai Angeline Naserian | An assessment of interventions undertaken by CBOs for environmental conservation: Case study Kirisia Forest, Samburu County.  | Dr. R. Kibugi Dr T. Thenya |
|  | A60/37278/2020  | Musura Paulin | Assessment of Tree Cover and Green Spaces in the Sustainable Development of Nairobi City County | Prof J. MuthamaDr. T. Thenya |
|  | I56/38088/2020 | Isaiah Ajang Deng | Application of Ground Magnetic survey for iron ore prospection in Mangala Area, Juba County, South Sudan | Dr. A. K. Waswa |
|  | I58/37507/2020    | Nimo Hassan Osman | Effects of climate-smart agricultural practices on livelihood and resilience of smallholder farmers in southern Somalia | Prof. Gachene, Dr. Leah Oyake |
|  | I58/37240/2020  | Timothy Muchoria Ngure | Assessment of impacts of community led climate adaptation actions on ground water in Turkana County | Dr. L. Olaka |
|  | A60/35046/2019  | Wachira Dennis Wanjohi | Effluent Management. Chrome (Cr) Regulation and Governance in Kenya  | Dr. T. Thenya, Prof Mbaria |
|  | A60/35582/2019  | Kinyua Beatrice Waithira, | Evaluation Of Utilization Of Herbal Plants And Their Characterization As A Management And Conservation Tool In Karima Hill Community Forest | Dr. T. Thenya, Dr. J. Gith |
|  | A60/34644/2019  | Asoyo Mary | An Assessment Of The Impacts Of Anthropogenic Activities On Karura Forest Ecosystem Management And Conservation Nairobi, Kenya.  | Dr. T. Thenya,Dr. Kagombe J, Kefri |
|  | I58/33512/2019:  | Sharon Chelangat | Challenges and opportunities in operationalizing Integrated MRV framework for Climate action in Kenya. | Dr George Outa and Dr Joanes Atella |
|  | I58/33851/2019 | Marvin Otieno Osumba  | Resource use patterns of marine resources in Diani-Challe Marine Protected Area Under a Changing Climate | Prof. D. Olago Dr. C. Sang |
|  | I58/36033/2019  | Florence Lilian Achieng Onyango  | The extent of the media engagement in the National Adaptation Process in Kenya. | Prof. Opere |
|  | I58/35373/2019 | Queen Kwindja Safari | Impact of Rift Valley lakes floods on waterborne diseases in Lake Baringo region, Kenya | Dr Opondo Dr L. Olaka |
|  | I56/35170/2019 | Maryce Nandeche Obindah | Effect of Intrusions on Gold Mineralization and occurrence at Rambi Target, Kenya | Dr. Mulwa  Dr. Waswa |
|  | A60/12784/2018.  | Gachoka Peter Ndung’u | An Assessment Of The Role Of Indigenous Knowledge On Conservation Efforts In Mau Forest Complex. | Dr. T. Thenya Dr. K. Kiemo |
|  | I56/ 6732/2017  | Acholla Emmanuel Mulehane  | Seismic Hazard Assessment for Kilifi Mombasa and Kwale Counties in Kenya  | Dr. J. K Mulwa Dr. Z.N Kuria  |
|  | I58/82132/2015 | Phoebe Achieng Oduor | Research thesis: Livelihood Impacts on Carbon Sequestration- Case study Mau Forest Complex | Dr L. Olaka and Dr. A. Ndambi, |
|  | A60/81168/2015  | Natalie Waithera | Assessment of the impact of stakeholder initiatives on conflict management and peace building in Imbirikani Group Ranch | Dr. T Thenya, Dr. M. Thumbi |
|  | A60/75127/2014  | Anne Majani Imbuka, | Public participation in governance of water resources: A case study of Njoro River Basin in Nakuru County | Dr. T. Thenya, Dr R. Kibugi |
|  | C50/64536/2013 | Onchonga Olivia Kwamboka | Effects of farming practices on wetlands, in Othaya Sub-County, Kenya | Dr. T. Thenya, Prof Mbaria |
|  | A60/68172/2013  | Erick F. Nyalwali Akotsi, | Assessment of stakeholders’ perceptions on environmental repair of the Nairobi River ecosystem along Kijabe and Gikomba Sections | Dr. T. Thenya, Prof J. Muthama |
|  | A60/67969/2013 | Brenda Mumbi Kamara, | The impact of landuse/cover change in Ngong Road Forest, Nairobi County | Dr. T. Thenya, Dr K. Kiemo |
|  | I56/75658/2014  | Evans Kipoo Maru | Impacts of Climate on Surface Water Resources in Njoro River Catchment, Kenya | Prof. Opere. Dr. Opijah |
|  | I58/87178/2016 | Elvira Symphrose Nalyanya | Influence of Climate Change on Aviation Related Ambient AirQuality at Jomo Kenyatta International Airport | Dr. B. K. MutaiDr. J. N. Ngaina |
|  | I54/87931/2016 | Cynthia Sheila Ogali | Assessing the effects of rising Sea Surface Temperatures (SSTs) and Ocean Acidification on the Coral reef eco-system(A Case of the Kenyan Coral Reef) | Dr. W. GitauDr. B. K. MutaiDr. J. N. Ngaina |
|  | I56/7696/2017 | Cynthia Wacuka | Radiative Forcing from Simulated Methane Concentration over Kenya | Prof J. K. Ng’ang’aDr B. K. Mutai |
|  | I56/9558/2017 | Timothy Kipkoech Tanui | Effects of Exceedance of Thunderstorm-Related Phenomena Thresholds on Aircraft Operations at Selected Airports in Kenya | Dr. B. K. MutaiDr. W. Gitau |
|  | I56/11373/2018 | Rose Nkatha | Influence of Weather on Pneumonia Prevalence in MeruCounty, Kenya | Dr. B. K. MutaiProf. J. K. Ng’ang’a |
|  | I56/12690/2018 | Mahali Esther Makoloi | Impact of climate variability and change on Sorghum yield in Lesotho | Mr. C. B. LukoritoDr. E. Bosire |
|  | I54/12731/2018 | Elizabeth Majani Sunguti | Assessment of the impacts of Climate Variability and Change on Maize Productivity in Narok County, Kenya | Mr. C. B. Lukorito, Prof. C. Oludhe |
|  | I56/16081/2018 | Lino Oscar | Characterization of the Turkana Low-level JetStream and the associated rainfall using CMIP6 Models and ERA5 Reanalysis | Dr. J. N. Mutemi |
|  | I56/16561/2018 | Mdudzi Msibi Sabela | Influence of the variation in some seasonal rainfall parameters on maize production in Eswatini | Dr. F. J. Opijah, Mr. C. B. Lukorito |
|  | I54/31747/2019 | Emmanuel Yusuf | Impacts Of Air Pollution On Pediatric Respiratory Infections Under A Changing Climate In Mombasa, Nairobi And Nakuru Cities | Prof. J. N. MuthamaDr. B. K. MutaiDr. D. M. Marangu |
|  | I54/34207/2019 | Sammy Dakta Domokwang | Assessment of Vulnerability of Pastoralists to Climate Change, A Case Study of West Pokot County, Kenya | Dr. E. N. BosireDr. J. N. Ngaina |
|  | I56/34984/2019 | Charles Tabane Tseole | Assessing the Influence Of El Nino Southern Oscillationand Indian Ocean Dipole Events on Rainfall Variabilityin Lesotho and their Impacts on Maize Yield | Dr. E. N. BosireDr. Kinama |
|  | I54/38049/2020 | Abel O. Balongo  | Designing a Maize Crop Weather-Based Insurance Index (MWII), in response to Rainfall Variabilities on Small Scale Farmers; A case of Kesses Constituency, Kenya. |  |
|  | I54M3/38834/2020 | Muhia Symon. | Effects of Climate Change on Reproductive Performance of Sahiwal Cattle under Extensive Grazing System at KALRO-Naivasha, Nakuru County, Kenya. | Dr. E. N. BosireDr. J. W. Mugo |
|  | I56/38907/2020 | Karen Kirui | Synoptic Controls of Seasonal Rainfall Extremes in East Africa. Case of Anticyclones Adjacent to the African Continent | Dr. J. N. Mutemi |
|  |  I56/38927/2020 | Philoice Ongoche | Assessment of the link between the prevalence and spread of COVID-19 and weather in Kenya. | Dr. B. Mutai Dr. W. Gitau |
|  | I54/38947/2020 | Athman Salim Hussein | Modeling Seawater Greenhouse Evaporator’s Porosity using Environmental Parameters for effective Freshwater Production |  |
|  | 156/38949/2020 | Lynn Chebet Kandie.    | Assessment of the influence of urbanisation on Mesoclimates of the cities of Kenya  |  |
|  | I56/40433/2021 | Aisha Nassor | Examining the spatial and temporal characteristics of rainfall over Zanzibar islands  |  |
|  | I56/40434/2021  | Wilfred Paulo Kessy | Simulation of tropical cyclone activities over southwestern indian Ocean | Dr F.Opijah Dr. Mutemi |
|  |  |  |  |  |

# INTERNATIONAL LINKS AND COLLABORATIONS

The Department of Earth and Climate Sciences has committed to develop links with the rest of world in tackling issues that impact on humankind and other biophysical players. The collaborations are through joint research programme and also capacity strengthening of staff. During the academic year 2021/2022, the Department was involved in several international links and collaborations. These are summarised in table 3 below.

Table 3: A summary of International links and collaborations with other insttitutions and agencies

|  |  |  |
| --- | --- | --- |
| S/N | NAME OF COLLABORATOR/PARTNER | NATURE OF RELATIONSHIP |
|  | Chinese Earthquake Administration | MoU on installation of seismic stations in selected regions in Kenya |
|  | Kenya Wildlife Service, University of Ghent, Belgium | MoU for collaboration on Mount Kenya Lakes Project |
|  | Tulane University and University of Montana, USA | MoU on studies of the rate of spreading and rapturing of the Rift Valley |
|  | United Kingdom Meteorological Office (UK Met Office) | Modularizing foundation training material in seasonal climate prediction for national and societal benefit |
|  | Tanzania Meteorological Agency (TMA) | Staff training and Research |
|  | Uganda Meteorological Department (UMD) | Staff training and Research |
|  | Ethiopia Meteorological Department (EMD) | Staff training and Research |
|  | Sudan Meteorological Authority (SMA) | Staff training and Research |
|  | United Nations Environmental Programme (UNEP) | Consultancy, development and research |
|  | African Technology Policy Studies Network (ATPS) | Consultancy, development and research |
|  | East African Community (EAC) | Consultancy, development and research |
|  | UNESCO/IHP Nile FRIEND Project | FRIEND-Water programme: * the establishment of regional databases
* establishment of a global network for research
* collaboration and exchange of data
* the initiation and coordination of regional research
* dissemination and capacity building
 |
|  | Somalia Water and Land Information Management (SWALIM) | Consultancy, development and research |
|  | Universite De Bourgogne (France), Climate Research Centre (CRC) | Education, Training and Research in climate science |
|  | World Meteorological Organization (WMO) | Education, Training and Research |
|  | Unesco Chair- Water Resources Sudan, UNESCO-CWR of Sudan | Consultancy, development and research |
|  | IGAD Climate Prediction and Application Centre (ICPAC) | Industrial attachment and research facilities to students |
|  | Kenya Meteorological Society | Professional Membership/Affiliation, Research and Mentorship  |
|  | UNDP | Consultancy, development and research |
|  | International Centre for Theoretical Physics (ICTP) | Training and research |
|  | University of Wales at Cardiff | Training and research |
|  | North Carolina State University | Training and research |
|  | University of Oxford | Training and research |
|  | Frieddrich-Schiller-Universitat (Jena) | Training and research |
|  | University of Cape Town- South Africa | Training and research |
|  | University of Connecticut | Training and research |
|  | University of Leeds | Consultancy, development and research |
|  | Norwigian University of Life Sciences (through WaSo project) | Consultancy, development and research |
|  | JKUAT, Kyushu University, JICA, KENGEN and GDC | Geothermal research in Menengai and Olkaria |
|  | Regional Centre for Groundwater Resources, IAEA, MWI, WRA and Water Tower Agency | Isotope hydrology through RA7021 |

Others international collaborations during 2021/2022 academic year included the following:

1. BRECciA: Building Research Capacity for Sustainable water and Food Security in Dry Sub-Saharan Africa. BRECcIA project was completed in March 2022. BRECcIA was a four year UKRI Global Challenges Research Fund (GCRF) program which aimed to develop research capacity across institutions that is self-sustaining and focused on improving food and water security for the poorest of society. The project vision was to strengthen research capacity and capabilities in institutions in Malawi, Kenya and Ghana to carry out impactful research that leads to positive policy and practice change for sustainable water and food security, which will have benefits for the 270 million people living in the Sub Saharan Africa drylands.
2. ARUA- CD: Centre of Excellence Climate and Development. The ARUA-CD consists of three core regional partners: the African Climate and Development Initiative (ACDI, based at the University of Cape Town) in Southern Africa, the Institute for Environment and Sanitation Studies (IESS), based at the University of Ghana, West Africa, and the Institute for Climate Change and Adaptation (ICCA), based at the University of Nairobi.The partnership has a flat governance structure with all three universities playing leadership roles. Each regional hub has extensive existing capacity, local and international networks, as well as research and student teaching experience in climate change and development. With support from African Research Universities Alliance (ARUA) and UK Research and Innovation (UKRI), it provides the project an excellent foundation upon which to build.
3. REACH: Improving water security for the poor. The research is focused on fragile states in Africa and South Asia, regions where water security challenges are greatest and poverty most acute. We are setting up ‘Water Security Observatories’ in Bangladesh, Ethiopia and Kenya to implement in-depth interdisciplinary research on water security and poverty. Findings will be relevant for scaling up and adapting to other countries and contexts.
4. Development Corridors Parnership: Partners from Tanzania, Kenya, China and the UK came together to build Development Corridors capacity so that development corridor decision-making can be based on sound scientific evidence and effective use of planning tools and procedures. Funded by the UK Research Council’s Global Challenges Research Fund the Development Corridors Partnership began in October 2017 and ended in December 2021. The Partnership build capacity to address concerns about development corridors by encouraging scientific collaboration and stakeholder engagement in key issues of corridor planning and management. This included applying the best tools and analyses (and developing new ones if necessary), and communicating recommendations to all stakeholders more effectively.
5. The German Academic Exchange Service (DAAD) in 2021 funded a total of eight interdisciplinary "Global Centres" to address global challenges in a new program. One of these programmes is The African Climate and Environment Centre – Future African Savannas (AFAS) which is hosted conjointly at the Université Félix Houphouët-Boigny (UFHB) with its African Centre of Excellence on Climate Change, Biodiversity and Sustainable Agriculture (CEA-CCBAD) in Côte d’Ivoire and the University of Nairobi (UoN) with its Institute for Climate Change and Adaptation (ICCA), Kenya. AFAS links with the Department of Earth and Climate Sciences (which hosts the ICCA) MSc program on Climate Change Adaptation by adding an additional focus on the potential of Nature-based Solutions (NbS) to address climate change adaptation and biodiversity conservation in West and East Africa’s savannas. Twenty students (10 in UoN and 10 in UHFB) from various parts of East and West Africa were enrolled in September 2021. The programme aims to create experts capable of engaging in science-policy-practice interfaces, specifically related to Climate, Ecosystem Services and NbS in African Savannas.

# PUBLICATIONS WITHIN THE REPORTING PERIOD (2021/2022)

The Department of Earth and Climate has a culture of publishing research findings in high impact journals. The doctoral students must publish their research in credible journals before they are cleared for graduation. In the Academic Year 2021/2022, the following publications were produced by the members of staff and doctoral students:

* 1. **Olago, D. O**., Raini, J., **Omuombo, C.,** Ogonda, G., Muli, J., Okello, C.& Ong’ang’a, O. (2021). Lentic-Lotic Water System Response to Anthropogenic and Climatic Factors in Kenya and Their Sustainable Management. In *Climate Change and Water Resources in Africa* (pp. 193-218). Springer, Cham.
	2. Ong'ech, **D. Olago**, D., Dulo, S., Opondo, M., **Ouma, G**., Albert, M., & Katrina, C. (2021). COVID-19 Impacts on Water Burden among Households in Turkana County. Kenya Policy Briefs, 2(1), 57-58.
	3. **Kaoga, J., Olago, D., Ouma, G., Ouma, G.,** & Onono, J. (2021). Cultural heritage as a pathway for sustaining natural resources in the Maasai’s Pastoral Social-Ecological System in Kajiado County, Kenya. African Journal of Agricultural Research, 17(6), 844-852.
	4. **Nyumba TO**, Sang CC, **Olago DO**, Marchant R, Waruingi L, Githiora Y, et al. (2021) Assessing the ecological impacts of transportation infrastructure development: A reconnaissance study of the Standard Gauge Railway in Kenya. PLoS ONE 16(1): e0246248. <https://doi.org/10.1371/journal.pone.0246248>
	5. Hope, R., Katuva, J., Nyaga, C., Koehler, J., Charles, K., Nowicki, S., Dyer, E., **Olago, D**., Tanui, F., Trevett, A., Thomas, M., & Gladstone, N. (2021).Delivering safely-managed water to schools in Kenya. (REACH Working Paper 8). Smith School of Enterprise and the Environment, University of Oxford
	6. Ngure, M. W., Wandiga, S. O**., Olago, D.** O., & Oriaso, S. O. (2021). Scaling up crop diversification among farming communities for food security under climate change: A case study of the Kenyan pelis programme. *African Journal of Food, Agriculture, Nutrition and Development*, *20*(7), 17025-17044.
	7. **Kaoga, J., Olago, D., Ouma, G., Ouma,** G., & Onono, J. (2021). Long-term spatial-temporal temperature characteristics of a pastoral ecosystem in Kajiado County, Kenya. *African Journal of Agricultural Research*, *17*(6), 896-906
	8. . Njagi, D. M., Routh, J., **Olago, D**., & Gayantha, K. (2021). A multi-proxy reconstruction of the late Holocene climate evolution in the Kapsabet Swamp, Kenya (East Africa). *Palaeogeography, Palaeoclimatology, Palaeoecology*, *574*, 110475.
	9. Garelick, S., Russell, J. M., Dee, S., Verschuren, D., & **Olago, D. O.** (2021). Atmospheric controls on precipitation isotopes and hydroclimate in high-elevation regions in Eastern Africa since the Last Glacial Maximum. *Earth and Planetary Science Letters*, *567*, 116984.
	10. **Kaoga, J., Olago, D., Ouma, G., Ouma, G**., & Onono, J. (2021). The evolving cultural values and their implications on the Maasai Pastoralists, Kajiado County, Kenya. *Scientific African*, *13*, e00881.
	11. Othoo, C., Dulo, S., & **Olago, D**. (2021). Flood-risk vulnerabilities of sanitation facilities in urban informal settlements: Lessons from Kisumu City, Kenya. *East African Journal of Science, Technology and Innovation*, *2*(4).
	12. Triboan, D., Obonyo, E. A., Ayesh, A., Yerima, S. Y., Basak, B., Wang’Ombe, W. **Olago, D**, ... & Madivate, C. (2021, October). A Transdisciplinary Framework for AI-driven Disaster Risk Reduction for Low-income Housing Communities in Kenya. In *2021 IEEE International Conference on Systems, Man, and Cybernetics (SMC)* (pp. 188-193). IEEE.
	13. Dan, M. E., **Olaka, L. A.,** Mamo, M. B., Chalo, D. M., & Cuni-Sanchez, A. (2021). Desert landscape services: Insights from pastoralist communities in northern Kenya. *Ecosystem Services*, *48*, 101243.
	14. Belay, A., Demissie, T., Recha, J. W., **Oludhe, C**., Osano, P. M., **Olaka, L. A**., & Berhane, Z. (2021). Analysis of Climate Variability and Trends in Southern Ethiopia. *Climate*, *9*(6), 96.
	15. Fazi, S., Amalfitano, S., Venturi, S., Pacini, N., Vazquez, E., **Olaka, L. A.,** & Butturini, A. (2021). High concentrations of dissolved biogenic methane associated with cyanobacterial blooms in East African lake surface water. Commun. Biol. 4, 845.
	16. Okoko, G. O., & **Olaka, L. A**. (2021). Can East African rift basalts sequester CO2? Case study of the Kenya rift. *Scientific African*, *13*, e00924.
	17. Osman, M. A., Onono, J. O., **Olaka, L. A**., Elhag, M. M., & Abdel-Rahman, E. M. (2021). Climate Variability and Change Affect Crops Yield under Rainfed Conditions: A Case Study in Gedaref State, Sudan. *Agronomy*, *11*(9), 1680.
	18. Owino, O. W., **Christopher, O.,** Simeon, D., & **Lydia, O.** (2021). African Journal of Environmental Science and Technology. *African Journal of Environmental Science and Technology*.
	19. Owino, O. W., **Christopher, O.,** Simeon, D., & **Lydia, O.** (2021). An analytical assessment of climate change trends and their impacts on hydropower in Sondu Miriu River Basin, Kenya. *African Journal of Environmental Science and Technology*, *15*(12), 519-528.
	20. Kounoudis, R., Bastow, I. D., Ebinger, C. J., Ogden, C. S., Ayele, A., Bendick, R., **Kianji G.,** & Kibret, B. (2021). Body-wave tomographic imaging of the Turkana Depression: Implications for rift development and plume–lithosphere interactions. *Geochemistry, Geophysics, Geosystems*, *22*(8), e2021GC009782.
	21. **Muthama, N. J**. (2021). Enhancing our care for the urban air we breathe.
	22. Harmsen, H., Wang'ondu, V. W., Mbau, J. S., & **Muthama, N. J.** (2021). Randomized hotspot strategy is effective in countering bushmeat poaching by snaring. *Biological Conservation*, *253*, 108909.
	23. **Kathambi, B. E**., **Muthama, J. N**., & Ang'u, C. (2021). Essence of Water Governance for SMEs for Sustainable Consumption in Nairobi, Kenya.
	24. Ouma, B., Wandayi, O. M., **Muthama, J. N.,** George, A., & Villacampa, M. (2021). Knowledge, attitudes and practices synthesis of waste management among horticultural processing MSMES in Kenya. *East African Journal of Science, Technology and Innovation*, *2*.
	25. Ngungi, J. M., & **Muthama, J. N.** (2021). Evaluation of policies as drivers of energy transition and modeling of a low carbon emission scenario for the energy generation sector in Kenya. *East African Journal of Science, Technology and Innovation*, *2*.
	26. Ouma, B., Okoth, M. W., **Muthama, J. N.,** Abong, G. O., & Villacampa, M. (2021). Capacity building influence on waste management among horticultural processing medium and small microenterprises in Kenya. *East African Journal of Science, Technology and Innovation*, *2*.
	27. Obiero, L. M., George, A., Wandayi, O. M., & **Muthama, J. N**. (2021). Energy and Water Use for Processing by Horticultural Micro, Small and Medium Enterprises. *East African Journal of Science, Technology and Innovation*, *2*.
	28. **Muthama, N. J**. (2021). Transitioning to green growth in Kenya: The Horticulture Productivity, Fuel Consumption and Short-Lived Climate Pollutants nexus. *East African Journal of Science, Technology and Innovation*, *2*.
	29. Wambua, P. M**., Muthama, N. J., & Thenya, T.** (2021). Challenges, opportunities and sustainability of community forest associations and water resource users associations: A case of Kilungu catchment, Kenya. *Journal of Sustainability, Environment and Peace*, *4*(1), 10-20.
	30. Cinny Tubman, L., Muigua, K., & **Muthama, N. J.** (2021). Assessment of the Influence of Beach Management Units on Fisheries Governance in Migingo Island, Kenya. *Journal of Sustainability, Environment and Peace*, *4*(2), 47-57.
	31. Mbithi, P. M., Mbau, J. S., **Muthama, N. J.,** Inyega, H., & Kalai, J. M. (2021). Higher Education and Skills Development in Africa: An Analytical Paper on the Role of Higher Learning Institutions on Sustainable Development. *Journal of Sustainability, Environment and Peace*, *4*(2), 58-73.
	32. Kirui, J. W., **Muthama, N. J**., Gachuiri, C. K., & Ngaina, J. N. (2021). Adaptation and mitigation strategies to climate change by smallholder dairy farmers: A case of Nandi County in Kenya. *Journal of Sustainability, Environment and Peace*, *4*(1), 39-47.
	33. Harmsen, H., Mbau, J. S., **Muthama, J. N**., & Wang'ondu, V. W. (2021). Comparing law enforcement monitoring data and research data suggests an underestimation of bushmeat poaching through snaring in a Kenyan World Heritage Site. *African Journal of Ecology*, *59*(4), 912-923.
	34. Kirui, J., Ngaina, J., **Muthama, N. J**., & Karuku, G. C. (2021). Spatiotemporal characteristics of smallholder milk production under changing climate: A case of Nandi County, Kenya. *East African Journal of Science, Technology and Innovation*, *3*(1).
	35. Manoa, D. O., Mwaura, F., **Thenya, T.,** & Mukhovi, S. (2021). Comparative analysis of time and monetary opportunity costs of human-wildlife conflict in Amboseli and Mt. Kenya Ecosystems, Kenya. *Current Research in Environmental Sustainability*, *3*, 100103.
	36. Kaua, C. G., **Thenya, T.,** & Mutheu, J. M. (2021). Analyzing Effects Of Climate Variability In The Nexus Of Informal Microfinance Institutions: A Case Study Of Tharaka South Subcounty, Kenya. *Challenges in Sustainability*, *9*(1), 1-15.
	37. Ochieng, C. N., **Thenya, T**., Shah, P., & Odwe, G. (2021). Awareness of traditional knowledge and attitudes towards wildlife conservation among Maasai communities: The case of Enkusero Sampu Conservancy, Kajiado County in Kenya. *African Journal of Ecology*, *59*(3), 712-723.
	38. **Kong’ani, L. N. S**., Wahome, R. G., & **Thenya, T.** (2021). Variety and management of developmental conflicts: the case of the Olkaria IV geothermal energy project in Kenya. *Conflict, Security & Development*, *21*(6), 781-804.
	39. Tanui, F., Dulo, S., **Ouma, G.,** & **Kuria, Z**. (2021). Petrography and Geochemistry of the Rocks in Lodwar, Kenya and their Influences on Groundwater Quality. *Africa Journal of Physical Sciences ISSN: 2313-3317*, *6*.
	40. Mwangi, M., Kituyi, E., & **Ouma, G.** (2021). A systematic review of the literature on the contribution of past climate information services pilot projects in climate risk management. *Scientific African*, *14*, e01005.
	41. Thongoh, M. W., Mutembei, H. M., Mburu, J., & **Kathambi, B. E**. An Assessment of Integration of MSMEs and CSA into Livestock Red Meat Value Chain: A Case Study of Kajiado County, Kenya.
	42. **Kathambi, B**., & Ogutu, F. A. (2021). Effects of Institutional Framework Lapses in Solid Waste Management; Case of Ngomongo, Nairobi, Kenya.
	43. Kathambi, B., Ogutu F., (August 2021), Ecological impacts of improper waste management frameworks on biodiversity conservation in Nairobi County, Kenya.J. Bio. Env. Sci. 19(2), 91-101,
	44. Mwangi, M., Kituyi, E., & **Ouma, G**. (2021). A systematic review of the literature on the contribution of past climate information services pilot projects in climate risk management. *Scientific African*, *14*, e01005.
	45. Mkalama, B., Ndemo, B. , Maalu, J. & Pokhariyal, G. (2021) Determinants of Innovativeness in Manufacturing Small and Medium Enterprises in Kenya: Unpacking Entrepreneurial Orientation4, *Business Research*
	46. Muendo, B.M., Shikuku, V.O., Lalah J.O., Getenga, Z.M., Wandiga S.O.& Rothballer, M.(2021) Enhanced degradation of diuron by two Bacillus isolated from diuron contaminated sugarcane and pineapple – cultivated soils in Kenya, *Applied Soil Energy*
	47. Richard Muita, Andrew Dougill, **Joseph Mutemi**, Stella Aura, Richard Graham, David Awolala, Elias Nkiaka, Linda Hirons,and **Franklin Opijah** (2021): Understanding the Role of User Needs and Perceptions Related to Sub-Seasonal and Seasonal Forecasts on Farmers’ Decisions in Kenya: A Systematic Review. Front. Clim., 07 April 2021 | <https://doi.org/10.3389/fclim.2021.580556>
	48. Alexander J. Roberts, Jennifer K. Fletcher, James Groves, John H. Marsham, Douglas J. Parker, Alan M. Blyth, Elijah A. Adefisan, Vincent O. Ajayi, Ronald Barrette, Estelle de Coning, Cheikh Dione, Abdoulahat Diop, Andre K. Foamouhoue, Morne Gijben, Peter G. Hill, Kamoru A. Lawal, **Joseph Mutemi**, Michael Padi, Temidayo I. Popoola, Pilar Rípodas, Thorwald H.M. Stein and Beth J. Woodhams (2021): Nowcasting for Africa: advances, potential and value. First published: 23 March 2021 <https://doi.org/10.1002/wea.3936>
	49. Lee, J.-Y., J. Marotzke, G. Bala, L. Cao, S. Corti, J.P. Dunne, F. Engelbrecht, E. Fischer, J.C. Fyfe, C. Jones, A. Maycock, **J. Mutemi**, O. Ndiaye, S. Panickal, and T. Zhou, 2021: Future Global Climate: Scenario-Based Projections and NearTerm Information. In Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 553–672, doi:10.1017/9781009157896.006
	50. Douglas J. Parker, Alan M. Blyth, Steven J. Woolnough, Andrew J. Dougill, Caroline L. Bain, Estelle de Coning, Mariane Diop-Kane, Andre Kamga Foamouhoue, Benjamin Lamptey, Ousmane Ndiaye, Paolo Ruti, Elijah A. Adefisan, Leonard K. Amekudzi, Philip Antwi-Agyei, Cathryn E. Birch, Carlo Cafaro, Hamish Carr, Benard Chanzu, Samantha J. Clarke, Helen Coskeran, Sylvester K. Danuor, Felipe M. de Andrade, Kone Diakaria, Cheikh Dione, Cheikh Abdoulahat Diop, Jennifer K. Fletcher, Amadou T. Gaye, James L. Groves,Masilin Gudoshava, Andrew J. Hartley, Linda C. Hirons, Ishiyaku Ibrahim, Tamora D. James, Kamoru A. Lawal, John H. Marsham, **J. N. Mutemi**,Emmanuel Chilekwu Okogbue, Eniola Olaniyan, J. B. Omotosho, Joseph Portuphy, Alexander J. Roberts, Juliane Schwendike, Zewdu T. Segele, Thorwald H. M. Stein, Andrea L. Taylor, Christopher M. Taylor, Tanya A. Warnaars, Stuart Webster, Beth J. Woodhams, and Lorraine Youds, 2022: Growing Science Capability to Bring about a Revolution in Weather Prediction, American Meteorological Society (<https://doi.org/10.1175/BAMS-D-20-0047.1>)
	51. David Olufemi Awolala, **Joseph Mutemi**, Elijah Adefisan, Philip Antwi-Agyei, and Andrea Taylor, (2022): Profiling User Needs for Weather and Climate Information in Fostering Drought Risk Preparedness in Central-Southern Nigeria. Frontiers in Climate Science. Front. Clim., 23 May 2022 | https://doi.org/10.3389/fclim.2022.787605.

# CONSULTANCIES BY STAFF MEMBERS

Members of staff are allowed and encouraged to undertake consultancy work in areas of international and national interests. In the Annual year 2021/2022, members of staff were involved in a number of consultancy works. These are summarise in table 4 below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Staff** | **Title of Grant** | **Funding Organization** | **Date** | **Amount** |
| Dr. Maggie Opondo | REACH | Foreign, Commonwealth & Development Office (FCDO) of the UK Government | 2015 - 2024 | N/A |
| GCRF Decent Work in Regional Value Chains | Economic & Social Research Council (UK) | 2019 – 2022 | 83,000 GBP |
| Governing Adaptation Finance for Transformation (GAP) | DANIDA | 2021 – 2026 | 11999998 DK |
| Dr. L. Olaka | National Geoparks Committee | UNESCO | 2018 – to date |  |

# NUMBER OF STAFF AND THEIR DESIGNATIONS

Table 4: List of Academic members of staff during the period 2021/2022

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Name** | **Academic Rank** | **Qualification** |
|  | Prof. F. M. Mutua | Professor  | PhD |
|  | Prof. N. J. Muthama | Professor | PhD |
|  | Prof. C. M. Nyamai | Ass. Professor | PhD |
|  | Prof. David N. Mungai | Ass. Profesor | PhD |
|  | Prof. D. O. Olago | Ass. Professor | PhD |
|  | Prof. A.O. Opere | Ass. Professor | PhD |
|  | Prof. C. Oludhe  | Ass. Professor | PhD |
|  | Prof. G.O. Ouma | Ass. Professor | PhD |
|  | Dr. D. W. Ichang’i | Senior Lecturer | PhD |
|  | Dr. E. W. Dindi | Senior Lecturer | PhD |
|  | Dr. C.M. Gichaba | Senior Lecturer | PhD |
|  | Dr. F. J. Opijah | Senior Lecturer | PhD  |
|  | Dr. J. N. Mutemi | Senior Lecturer | PhD |
|  | Dr. Wilson Gitau | Senior Lecturer | PhD |
|  | Dr. Z. N. Kuria | Senior Lecturer | PhD |
|  | Dr. J.K. Mulwa | Senior Lecturer | PhD  |
|  | Dr. Thuita Thenya | Senior Lecturer | PhD |
|  | Dr. Jane M. Mutune | Lecturer | PhD |
|  | Dr. S. K. Rwigi | Lecturer | PhD |
|  | Ms. G. K. Kianji | Lecturer | M.sc |
|  | Dr. L. A. Olaka | Lecturer  | PhD |
|  | Dr A. K. Waswa | Lecturer | PhD |
|  | Dr. D. D. O. Waga | Lecturer | PhD |
|  | Mr. C. B. Lukorito | Lecturer | M.Sc |
|  | Dr. B. K. Mutai | Lecturer | PhD |
|  | Dr. E. N. Bosire | Lecturer | PhD |
|  | Dr. J. W. Mugo | Tutorial Fellow | Ph.D |
|  | Dr. J. R. Kanoti  | Tutorial fellow | PhD |
|  | Dr. C. A. Omuombo | Tutorial fellow | PhD |
|  | Dr James Kaoga | Tutorial fellow | PhD |
|  | Ms. Eunice Boruru  | Tutorial fellow | MSc |
|  | Ms. T. W. Githinji | Tutorial fellow | MSc |
|  | Dr. B. E. Kathambi | Tutorial Fellow | PhD |
|  | Dr. Abdimajid N. Abdi | Tutorial Fellow | Ph.D |
|  | Ms. L.N. Kong’ani | Tutorial Fellow | Msc |
|  | Mr. Cohen Ang’u | Tutorial Fellow | Msc |
|  | Ms. Linda Obiero | Graduate Assistant | MBA |
|  | Ms. Phyllis Wamaitha | Graduate Assistant | Msc |

Table 5: List of Nonteaching staff during 2021/2022

|  |  |  |  |
| --- | --- | --- | --- |
| NO | NAME | Rank | Qualification |
| 1 | Mr. T.N. Katoo | Chief Technologist | Bsc |
| 2 | Mr. W. B. Masieyi | Principal Technologist  | M.Sc |
| 3 | Mr. Henry Kahi | Principal Technologist | Msc |
| 4 | Mr. B. K. Mutegi | Assistant Chief Technologist | MSc |
| 5 | Mr. S. G. Mbiga | Senior Technologist | BSc |
| 6 | Ms. E. N. Kamau | Senior Technologist | BSc |
| 7 | Ms. J. K. Mulu | Senior Technologist | Bsc |
| 8 | Mr. D. W. Mutua | Senior ICT Technologist | Diploma |
| 9 | Mr. P. M. Kaunga | Technologist | MMTC-IMTR |
| 10 | Mr. Joash Lagat | Technologist  | MMTC-IMTR |
| 11 | Mr. R. K. Gichini | Technologist | Certificate |
| 12 | Ms. C. A. Chiaji | Technologist | BSc |
| 13 | Ms. P. A. Waringa | Technologist | Certificate |

Table 6: List of administrative staff during 2021/2022

|  |  |  |  |
| --- | --- | --- | --- |
| No | Name | Rank | Qualification |
| 1 | Mrs Nancy Ireri | Administrator |  |
| 2 | Ms. Carol Githinji | Secretary |  |
| 3 | Ms. Lilian Wanjiru Kairu |  |  |
| 4 | Jane Watiri |  |  |
| 5 | Martha Mugo |  |  |
|  |  |  |  |

# LIST OF VISITING PROFESSORS DURING 2021/2022

1. Prof. Juan Manuel García-Ruiz, Research Professor, University of Granada, Spain
2. Jens Emborg, Assoc. Professor, University of Copenhagen, Denmark
3. Vibeke Vindeløv, Professor Emerita, University of Copenhagen, Denmark

# LIST OF COMMUNITY ENGAGEMENT PROGRAMMES DURING 2021/2022

1. EXPERIENTIAL FIELD TRAINING PROGRAMME - SUSTAINABLE LAND USE (SLUSE)

The experiential field programme by WMI was designed to allow students to participate effectively in interdisciplinary assignments at the community level. The programme is meant to give student first-hand experience of the activities that the community and other stakeholders at the grassroots level are involved in. The program has been offered since 2012 jointly with the University of Copenhagen and Roskilde University (RUC).

1. MONTHLY EXPERIENTIAL LEARNING PROGRAMME

The Institute conducts monthly experiential learning activities at various sites with selected themes. The programme was designed to help link theory and practice by engaging students on various national, county and community environmental issues. The recent monthly experiential learning activities were conducted at John Michuki Memorial Park and the Wangari Maathai Institute Campus

1. THE FIFTEENTH SESSION OF THE CONFERENCE OF THE PARTIES (COP15) OF THE UNITED NATIONS CONVENTION TO COMBAT DESERTIFICATION (UNCCD) IN ABIDJAN, CÔTE D’IVOIRE, FROM 9 TO 20 MAY 2022.

The COP15 theme, ‘Land. Life. Legacy: From scarcity to prosperity', is a call to action to ensure land, the lifeline on this planet, continues to benefit present and future generations.

1. CLIMATE TALKS STUDENT FORUM EARTH DAY, APRIL 22ND 2022 AEST

The International Universities Climate Alliance is inviting student representatives from across our 56 universities globally to join a global virtual #ClimateTalks Student Forum during Earth Day on April 22nd 2022. Earth Day has been celebrated globally for more than 50 years and is an event dedicated to promoting awareness of the health of our environment.

1. WANGARI MAATHAI DAY / AFRICA ENVIRONMENT DAY

In January 2012, the African Union (AU) adopted a decision calling for the joint celebrations of the African Environment Day and Wangari Maathai Day in order to pay tribute to the late Nobel Laureate's green legacy. The celebrations are observed every year (3rd March), spearheaded by Wangari Maathai Institute in partnership with the Green Belt movement. Celebrations for the year 2021 were observed on March, 3 at the John Michuki Memorial Park, Nairobi.

1. PUBLIC ENGAGEMENT ON THE IMPACTS OF HUMAN BEHAVIOR ON PLANETARY HEALTH

On 23 March 2022, the Institute for Climate Change and Adaptation (ICCA), the University of Nairobi and The Mawazo Institute co-hosted in-person presentations and a plenary session. This event explored scientific approaches, critical research, and transformative practices that can help better understand planetary health and its implications for the African continent.

1. THE SCIENCE OF METEOROLOGY: ADVANCES IN METEOROLOGICAL TRAINING AND RESEARCH

The Meteorology section hosted a Webinar today 16th June 2021 on the science of Meteorology under the theme advances in meteorological training and research. This is part of the UoN@50 celebrations.