



FOSSE

Newsletter

2021



**'AN ENTREPRENEURSHIP DRIVEN
FACULTY THAT EQUALLY BRINGS
A SERVICE TO THE COMMUNITY'**

ISSUE #3



"The Scientist is not a person
who gives the right answers; but
he is one who asks the right
questions"

- Claude Levi-Strauss

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In keeping with the action steps articulated in UNESWA's repackaged strategy for 2016 to 2022, the FOSE has launched the Bachelor of Science in Geographic Information Science (BSc. GISc) with the first intake of students starting in October, 2020. The BSc. GISc teaches computing skills with applications to Geography. Students will learn how to use GIS software to solve problems related to mapping, climate change, resource exploration, urban planning, etc. We congratulate the Department of Geography, Environmental Science and Planning (GEP) for introducing such a market driven programme.

Please read through this newsletter to learn more about the FOSE 2020 highlights which include research publications; conference presentations; research grants; outreach activities; awards, appointments and honours. I wish you a healthy and productive 2021.

- Prof. Sandile S. Motsa

Welcome to the third issue of the annual Faculty of Science and Engineering (FOSE) Newsletter. Due to the COVID-19 pandemic, the year 2020 presented multiple disruptions in teaching and learning, research and community service activities. Notwithstanding these challenges, the Faculty members proved to be resilient and innovated their way through the pandemic year. It is good to see that the newsletter is filled with tons of stories that highlight faculty activities and the contributions that the FOSE staff continue to make in the communities they serve.

The FOSE, through the Department of Chemistry and Centre for Sustainable Energy Research (CSER), was one of the first entities in Eswatini to produce hand sanitizers that are crucial in curbing the spread of the COVID-19 pandemic. The CSER assisted the department by securing a donation of 20000L denatured ethanol from USA distillers which was to be used to manufacture the hand sanitizers. The Faculty was to collaborate with the Government through the Ministry of Health's Central Medical Stores (CMS) to mitigate the spread of the COVID-19 virus amongst the population through the distribution of hand sanitizers using a bottom-up approach on a sustainable basis.



The Sanitizer Project spearheaded by the Department of Chemistry





Dr. Sanni Shamsudeen Ademola is a Senior Lecturer in the Department of Computer Science, Faculty of Science and Engineering, University of Eswatini. Dr. Sanni has a Bachelor Degree in Computer Science from University of Ilorin, Ilorin, Nigeria; a Master's Degree in Library and Information Science and a PhD (Doctor of Philosophy with Distinctions) in Information Science from the University of Malaya, Kuala Lumpur, Malaysia. Dr. Sanni has worked as a Research Assistant for Malaysian Citation Center (MCC) and Malaysian Abstracting and Indexing System (MyAIS) Project of the Ministry of Higher Education, Malaysia from June 2009 to December 2014. He was appointed in August 2015 as a Lecturer and later promoted to Senior Lecturer in the Department of Information Technology, School of Computing and Information Technology (SCIT), Kampala International University (KIU), Kampala, Uganda. He served as a visiting Lecturer at the Islamic University in Uganda (IUIU) from August 2018 to July, 2019. During his time at Kampala International University (KIU), he had served as the Coordinator, Center for Digital and Open Distance eLearning (ODEL) and Secretary, Doctoral Committee of the School of Computing and Information Technology.

Dr. Sanni has a passion for academic research and has published 18 scientific journal articles in peer-reviewed scholarly journals in the field of Computer Science, Information Science and Multidisciplinary Science. Dr. Sanni has successfully supervised 10 Master's Degree dissertations and many Bachelor Degree Projects and has presented several academic research papers at both local and international conferences. He has organized and facilitated many seminars and workshops on eLearning/Online Learning Environment; Research Methods; Reference Sources and Services and Computer Applications. His areas of research interest are Information Science, Information Systems, Data Science, Scientometrics, Citation Analysis, Innovation Diffusion and Technology Adoption. Dr. Sanni Shamsudeen is a member of the Nigerian Computer Society (NCS), East African Quality Assurance Network (EAQAN) and Librarians Association of Malaysia. His hobbies are Aerobics, Swimming and Adventure Sports.



Prof. Boluwaji Ade Akinnuwesi is an Associate Professor in the Department of Computer Science, University of Eswatini. He obtained his degrees (B.Sc., M.Sc. and Ph.D) in Computer Science. He focuses on Software Engineering and its Applications and thus applies software development methodologies to model and solve real-life problems. He has developed several software frameworks



for solving some life problems and examples are LASU eHelpDesk software and LASU ePERS software for auto-generation of CVs and APER form for academic staff. His core area of application is Medical Informatics. He applies soft computing and machine learning techniques in developing medical diagnostic systems that could enhance the accurate diagnosis of tropical diseases with overlapping symptoms. While at Lagos State University (LASU), Nigeria as an Associate Professor, he successfully supervised 11 Masters and 2 Doctoral theses. Also, he has served in various academic management and administrative capacities such as Acting Head of Department, LASU; Director of Computer Centre, Bells University of Technology, Nigeria; Member of University Senate, Department/Faculty Board of Studies and several committees in the University. He has served in the capacity of the external examiner to some Universities and Colleges of Education. He also carries out review activities for several journals and conferences. He has published many papers in journals and conference proceedings in his area of research. He is a full member of the following professional bodies: Computer Professional Registration Council of Nigeria, Nigeria Computer Society and Association of Computing Machinery. He was a research scholar at Southern University, Louisiana, USA. His areas of interest are: Software Engineering, Soft Computing, Database Systems, Machine Learning, Medical Informatics, System Analysis and Design.



Dr. Vusi Tsabedze is a Lecturer in the Department of Computer Science. He is a prolific scholar, especially in training, research and consultancy. He holds a PhD in Information Studies from the University of Zululand; MBA in Management strategy with the University of Namibia; MA in information studies with the University of Zululand; BA in Library Science with the University of Namibia; Certificate in Project Management with the University of North Carolina; Certificate in E-Learning with the University of Manitoba and Senior Management Development program with the University of Stellenbosch. Dr Tsabedze has contributed immensely to the research outputs of the University of South Africa. For example, so far this year (2020) he has already published seven (7) book chapters and seven (7) articles in Scopus and ISI indexed journals. He also supervises masters and doctoral students. November 5th, 2020 Dr Tsabedze received an award on Digital Records Curation Programme through International Council on Archives (ICA). In October 2020, one of his journal articles has been nominated for the Best Research Award on New Science Invention. Dr Tsabedze is a stern believer incapacitating LIS professionals in Eswatini through training and curriculum development. Before joining the UNESWA he has been a post-doc research fellow in the Department of Information Science at the University of South Africa. The purpose of the research fellow is to encourage critical discourse and to enhance research capacity. In Eswatini he has worked for Institute of Development Management (IDM) as a Senior Consultant.



Dr. Mpumelelo Matse joined the Department of Physics at UNESWA in October 2020. He graduated with a BSc. in Physics and Mathematics from UNESWA in 2012, and moved to the African Institute for Mathematical Sciences (AIMS) in Cape Town for a 10-month taught MSc program in Mathematical Sciences in the year 2013. Matse later obtained his physics MSc (2015) and PhD (2020) at Simon Fraser University in Canada. His main field of interest is soft matter physics. He applies fundamental theory and computational methods to study transport phenomena in soft matter systems on a wide range of length scales from the atomic level up to the 100-nm scale. He is particularly interested in devising ways to control transport properties in soft matter for applications in the development of novel devices and technologies based on nano-structured soft and biomolecular materials. Matse's PhD thesis was nominated for the 2020-2021 WAGS-ProQuest Innovation in Technology Award, which recognizes the innovative application of technology through originality, creativity, and scholarly significance at the master's or doctoral level. He has published 5 first-authored papers in reputable international journals.



Mr. Melusi Magagula joined the Department of Physics at UNESWA in October 2020 from the Department of Chemistry where he started working in 2016. He did his BSc at UNESWA, BSc. Hons and MSc. In Applied Radiation Science at North West University.



the University of Strathclyde and United Purpose Malawi of scaling up a solar microgrid enterprise in Malawi. Her work involved developing techno-economic models to explore various deployment scenarios that were then used to inform the United Purpose social enterprise business plan. The staff member has recently re-joined the University of Eswatini as a lecturer in the Department of Electrical and Electronic Engineering. Her research interests include rural electrification; off-grid solar PV systems; grid integration of renewables and smart grids.

Miss Nothando Thwala initially joined the Department of Electrical and Electronic Engineering at the University of Eswatini as a teaching assistant in 2016 after receiving her bachelor's degree from the institution in 2015, where she graduated as the top student in electrical engineering and received the SEC award. She holds a Master's degree in Electronic and Electrical Engineering from the University of Strathclyde, in Glasgow, UK. During her studies in the UK she undertook a project by

ESSEX VISIT BY MR. BANELE MATSEBULA



Mr. Matsebula at the University of Essex during his visit

Mr. Banele Matsebula of the Department of Computer Science visited the University of Essex as part of a Royal Academy of Engineering (RAE) funded project from the 11th February to the 30th April 2020. He was attached to the Department of Computer Science and Electronic Engineering under the mentorship of Dr. Faiyaz Doctor. Dr. Doctor has considerable experience in teaching computer engineering degree programmes covering advanced topics such as the Internet of Things Technology and Artificial Intelligence. He also has a growing research interest in the use of Virtual Reality (VR) for building innovative immersive applications and collaborative intelligent environments. The purpose of this visit was to facilitate the development of a virtual innovation lab for enhancing collaboration in innovation and entrepreneurship in Eswatini and other sub-Saharan Africa countries. Specific activities during Mr Matsebula's visit included:

- Research into immersive technologies and machine learning approaches for supporting collaborative activities.
- Determine metrics for evaluating VR and immersive technologies for collaborative environments/activities and develop appropriate evaluation framework(s).
- Acquire background knowledge on capabilities of commercial and open-source VR software, hardware (headsets) for

collaborative activities (training, ideation and product design).

- Use commercial VR software and associated hardware for designing and implementing a tool for collaborative innovation activities.
- Design user-centred empirical studies for evaluating the VR tool against the evaluation framework(s).
- Investigate computational intelligence augmentation methodologies for supporting creative design processes.

The final product should be a tool that can be used as a collaboration platform by start-ups/entrepreneurs in Eswatini and beyond. This tool will be able to guide the entrepreneurs throughout the process. It is an intelligent alternative to a physical Innovation Lab which requires people to be at the same physical location for them to collaborate. The project was initially planned to run from February to August 2020 but due to the Coronavirus pandemic, it had to be extended to November 2021. Mr. Matsebula is currently working on the project from Eswatini as his stay in the UK was cut short.



Mr. Matsebula in front of the Innovation Centre at the University of Essex

BASS FELLOWSHIP FOR PROF. A. MONADJEM



Prof. Ara Monadjem during his stay in Chicago

Prof. Ara Monadjem from the Biological Sciences Department received a BASS fellowship allowing him to spend 6 months of his sabbatical in The Field Museum, Chicago collaborating with Dr. Bruce Patterson studying the systematics of taxonomy of African bats using the museum's vast African specimen collection. Unfortunately, this was cut short by 8 weeks due to the outbreak of the Covid-19 pandemic.



The Field Museum in Chicago, USA

APPOINTMENT OF PROF. SIMISO K. MKHONTA TO SANU BOARD OF GOVERNORS

Prof. Simiso K. Mkhonta from the Physics Department was appointed by Minister of Education and Training to serve in Board of Governors (as Deputy Chairperson) of the Southern Africa Nazarene University effectively from August, 2020 for a period of three years. SANU is a Government Parastatal that was founded by the Church of the Nazarene. It is comprised of three faculties, namely: Faculty of Health Sciences, Faculty of Education, and the Faculty of Theology. The Honourable Minister, Mrs Lady Howard-Mabuza said that she was very pleased to have Prof. Mkhonta in the SANU Board given his extensive higher education experience and leadership skills having served as a Head of Department of our Physics Department.



Prof. Simiso K. Mkhonta, the late Prime Minister – Honourable Ambrose Mandvulo Dlamini, with the SANU Board

Mkhonta is an Associate Professor of Physics and he is also a member of the Eswatini Academy of Sciences. He is also serving as member of the Board of Trustees of the Eswatini Environment Fund that is under the Ministry of Tourism and Environmental Affairs. A fund that was capitalized by Eswatini Government to the tune of 4 million Emalangeni to support community-driven environmental rehabilitation projects. Prof. Mkhonta has PhD in Computational Physics from McGill University in Montreal, Canada. His interest is on the application of computational models to study the dynamics of multi-body systems including numerical weather predictions, infection disease spreading, and pattern formation in two dimensional materials. Prof. Mkhonta will serve on the SANU board until 2023.

2020 COHORT OF THE AFRICA OXFORD VISITING FELLOWSHIP PROGRAM

Dr. Nosiphiwo Zwane was selected to be part of the 2020 cohort of the Africa Oxford Visiting Fellowship Program. In this program, twenty distinguished African researchers from twelve African countries were selected from nearly two hundred and fifty

outstanding applications from thirty countries (see <http://www.afox.ox.ac.uk/previous-fellows/>). Due to COVID-19 epidemic Dr. Zwane could not visit Oxford in 2020. She will be visiting the Department of Physics, working with Prof Subir Sarkar on Cosmological tests of Cosmic Acceleration due to Inflationary Quantum Fluctuations next year, 2021.

DIGITIZATION OF UNESWA CONTENT: UNDP ACCELERATOR EXPERIMENTS

The Faculty received funding from UNDP, under their Accelerator Experiments programme, to develop digital learning platform. The experiment is aimed at exploring the use of app-based technologies for delivering content and supporting students in the learning process. The goal is to increase access and reduce the costs of tertiary education. The project design takes into consideration the socio- economic conditions of students, data costs and connectivity limitations. It has 4 main objectives, namely:



The team led by Prof. Motsa working on the project

- To digitize existing print modules and create engaging content that stimulates learning through multimodal resources;
- To train students and equip them with a skill set that can land them jobs at international tech companies or help them start their own businesses;
- To offer convenient and cost-effective learning support technologies that complement existing learning platforms; and
- To implement UNESWA policies on blended and develop resources for online and distance learning.

Through research and experimentation, offline resources were developed in the form of Progressive Web Applications (PWA). The PWAs would be very beneficial to students because they run offline and do not depend on network availability or coverage. In addition, the PWAs are typically less than 1Mb in size, which means that they would cost less than 1 Lilangeni to install and can run on the most basic smartphone without taking up a lot of space. The Project team comprised of Prof. S. Motsa, Dr. A. Metfula, Mr E. Mbunge and four students (Khulekani Matsebula, Phathizwe Vilakazi, Siyabonga Msibi and Machawe Shongwe). The students that participated in the project gained vital technological, communication and entrepreneurial skills to position them to be employable or explore business opportunities that exist in the mobile and online markets.

PROF. MOTSA RANKED IN STANFORD UNIVERSITY'S STUDY OF THE WORLD'S TOP 2% SCIENTISTS

A new study led by researchers from Stanford University, together with the publishing house Elsevier and SciTech Strategies, has identified the top 2% of the world's nearly 7 million working Scientists. A team of experts led by Prof. Ioannidis, prepared a publicly available database of the world's top Scientists which is archived in Mendeley.

(<https://data.mendeley.com/datasets/btchxktzyw/2>)

This large database is based on data from Scopus on citations, h-index, hm-index, citations to papers in different authorship positions and a composite indicator. The published list presents unbiased evidence from reputable external sources on the quality of research conducted by scientists. The study recognized Professor Sandile Motsa as one of the world's most cited researchers in his research field of Numerical & Computational Mathematics. This recognition places the Faculty of Science and Engineering in the global map of excellence in Scientific Research.

More information about the study can be found in the journal PLOS Biology on the following link

(<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3000918>)

HUAWEI 5G ACADEMY INSTRUCTOR CERTIFICATION

Dr. Thembelihle Dlamini successfully completed the Huawei certification requirements and he is recognised as a Huawei 5G Academy instructor. He first obtained the Huawei Certified ICT Associates (HCIA-5G) Certificate and the certificate is valid for 3 years. The award ceremony was held in the department of Electrical and Electronic Engineering.



Dr. Thembelihle Dlamini receiving his (HCIA-5G) Certificate



Dr. Thembelihle Dlamini receiving a cell phone gift from Huawei



Dr. Thembelihle Dlamini with the Huawei and UNESWA teams

APPOINTMENT OF DR WISDOM M.D. DLAMINI TO SERVE ON THE GLOBAL ENVIRONMENT FACILITY SMALL GRANTS PROGRAMME NATIONAL STEERING COMMITTEE

Dr. Wisdom M.D. Dlamini from GEP Department was appointed to serve on the Global Environment Facility (GEF) Small Grants Programme (SGP) National Steering Committee. The SGP aims to deliver global environmental benefits in the GEF focal areas of biodiversity conservation, climate change mitigation, protection of international waters, prevention of land degradation, and elimination of persistent organic pollutants through community-based approaches. During the 3-year tenure, Dr. Dlamini and other members of the committee will provide overall guidance and direction to the Country Programme and contribute to developing and implementing strategies for Country Programme sustainability.

MEMBERS OF FACULTY NOMINATED TO THE MULTI-STAKEHOLDER COVID-19 SURVEILLANCE, MODELLING AND DATA MANAGEMENT TECHNICAL WORKING GROUP (TWG)

Prof. S.K. Mkhonta, Dr W.M.D. Dlamini, Dr. J. Malinzi and Dr. S. Padidar were nominated to be a part of the multi-stakeholder COVID-19 Surveillance, Modelling and Data Management Technical Working Group (TWG) under the auspices of the Ministry of Health. This team was constituted to provide technical guidance to the Ministry of Health in as far as the COVID-19 response is concerned. Dr Dlamini contributed a number of presentations focusing on the spatial or geographical aspects of the pandemic in Eswatini.



NINE MEMBERS OF THE FOSE APPOINTED MEMBERS OF THE KINGDOM OF ESWATINI ACADEMY OF SCIENCE (KEAS)

Prof. Themb'alilahlwa Mahlaba, Prof. Simiso Mkhonta, Prof. Cebisile Magagula, Dr. Thabile Ndlovu, Dr. Zodwa Makukula, Dr. Wisdom Dlamini, Dr. Sabelo Dlamini, Dr. Lihle Mafu and Dr. Geina Vilakati have been appointed to be members of the Kingdom of Eswatini Academy of Science (KEAS). The members were appointed into the Academy in recognition of their distinguished and continuing achievements in original Scientific research. The KEAS was established to provide independent, evidence-based scientific advice on issues of national interest and builds public awareness and understanding of Science. The academy also seeks to mobilize resources that can be used for Scientific research and associated activities and to champion, celebrate and support excellence in scientific research performed by Scientists who are in Eswatini. The Academy was launched in 2018 with 5 members who were designated to be "Founding Members". The Founding Members are Prof. Sandile Motsa, Prof. Ara Monadjem, Prof. Priscilla Dlamini, Prof. Lydia Makhubu and Prof. Justice Thwala. Prof. Monadjem was elected President of KEAS. Since then, KEAS had a productive meeting with the acting Minister of Information Communication and Technology on the 27th of November 2020.

INVITATION OF PROF. HEINZ R. BECKEDAHL TO CHAIR THE ESWATINI NATIONAL (INTERNATIONAL GEOSCIENCE PROJECT (IGCP) COMMITTEE

Prof. H.R Beckedahl have been invited to chair the Eswatini National IGCP (International Geoscience Project) committee, a subdivision of the UNESCO Eswatini National Committee. IGCP fosters interdisciplinary geoscientific research among researchers from around the world, through joint research work, meetings and workshops. Since its creation in 1972, IGCP has supported over 500 projects

in about 150 countries. IGCP brings together scientists from around the world, and provides them with seed money to devise and conduct joint international research and to publish the results jointly. High on the list of selection criteria are scientific quality and the extent of the international, multidisciplinary cooperation any project will engender. The main drivers behind the IGCP are UNESCO's Division of Ecological and Earth Sciences, and the International Union of Geological Sciences (IUGS). Other sponsors are the National Academy of Sciences (USA), UNESCO's Water Division, and The International Union for Quaternary Research (INQUA).

IGCP's scientific objectives include:

- Increasing our understanding of the geoscientific factors affecting the global environment in order to improve human living conditions
- Developing more effective methods to find and sustainably exploit natural resources of minerals, energy and groundwater
- Increasing our understanding of geological processes and concepts of global importance, including an emphasis on socially relevant issues
- Improving standards, methods and techniques of carrying out geological research, including the transfer of geological and geotechnological knowledge between industrialized and developing countries.

IGCP's scientific objectives (which by extension clearly also apply to IGCP in Eswatini), include:

- Increasing our understanding of the geoscientific factors affecting the global environment in order to improve human living conditions
- Developing more effective methods to find and sustainably exploit natural resources of minerals, energy and groundwater
- Increasing our understanding of geological processes and concepts of global importance, including an emphasis on socially relevant issues
- Improving standards, methods and techniques of carrying out geological research, including the transfer of geological

and geotechnological knowledge between industrialized and developing countries and hence Eswatini.



Prof. Heinz R. Beckedahl the chair of the Eswatini National (International Geoscience Project (IGCP) Committee

OTHER ACHIEVEMENTS BY FACULTY MEMBERS

- Prof. H.R Beckedahl has been appointed as co-editor of the 3 Volume book to be published by Springer Nature series: *Geography of the Physical Environment*
<https://www.springer.com/series/15117>
- Prof. H.R Beckedahl was appointed as an Honorary Research Fellow of the School of Agriculture, Earth and Environmental Sciences, at the University of KwaZulu-Natal for the period 2020 to 2023.
- Dr. S.F. Mamba has been appointed External Examiner by the University of Zululand for Master's dissertation on Assessment of the impact of natural resource conservation on the livelihoods of KwaNibela, Kwazul-Natal for a candidate - Department of Geography and Environmental Studies.

THE DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND PLANNING GRANTED ACCESS TO BIG COMMERCIAL SATELLITE DATA

Although satellite imagery of Earth has been available for years, the technology being keeps getting better and better. Planet, a private company specializing in Earth Observation Labs, has over the recent past been launching hundreds of small but technologically advanced satellites to monitor the globe. As part of its Education and Research Program, the company is offering university researchers, academics, and scientists' access to the huge volumes of data for non-commercial research purposes.

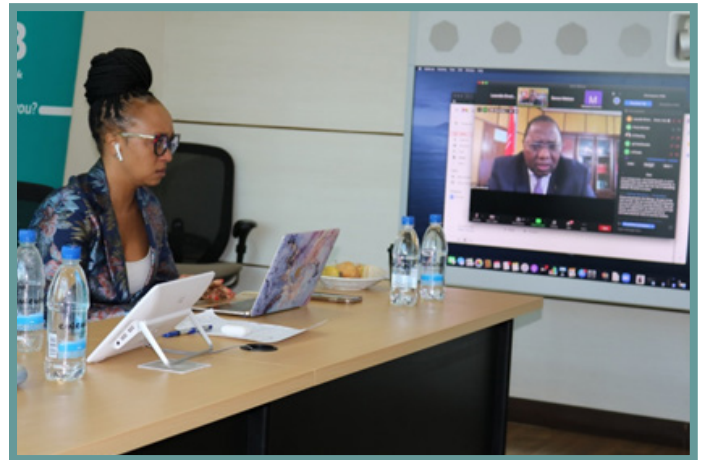
The GEP Department successfully applied for access to millions of Emalangeni worth of high-resolution commercial satellite imagery covering Eswatini. This opens an opportunity for the Department and the University to unlock the power of a one-of-a-kind dataset that can be used to answer several developmental challenges in the country. These include studying forest dynamics, monitoring urban and settlement growth, measuring agricultural yields, and building object-detection algorithms to count, identify, and measure specific resources of interest, among many other potential applications.

The Department's staff, students, and researchers can now gain access to Planet's large trove of remote sensing data, download imagery, analyse trends, and publish the results. With the new BSc in Geographic information Science programme and the country's desire to have its own space programme, this initiative will provide impetus in building the required capacity.



A satellite image showing part of the Simunye sugarcane fields, Hlane National Park and Mlawula Nature Reserve

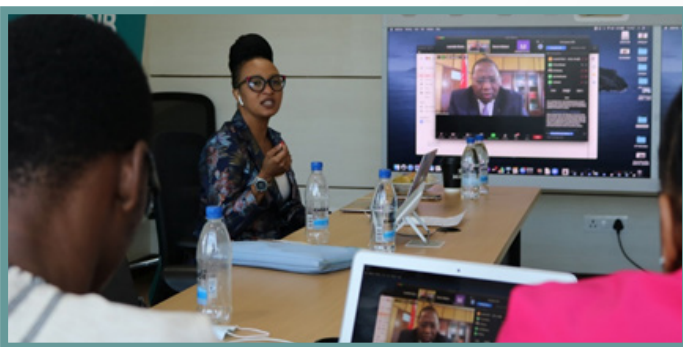
The University of Eswatini (UNESWA) together with Royal Science & Technology Park (RSTP), the Ministry of ICT, the Ministry of Education and Training and Eswatini Investment and Trade Promotion Authority (EIPA) virtually hosted the 4th edition of the ICT Fair under the theme “**Digital Transformation in the New Normal**”, on the 30th October 2020. The Kingdom of Eswatini has been affected by coronavirus (COVID-19) pandemic that spreads rapidly across the world disrupting all aspects of life. The pandemic presents unprecedented challenges as well as opportunities for the adoption of emerging technologies to ensure safe re-opening and post-pandemic business operations. With this in mind, the event was attended and graced by the then His Excellency the Right Honourable Prime Minister Ambrose Mandvulo Dlamini, the Acting Minister of ICT Senator Themba Masuku, together with experts and captains from the industry will be deliberating on the role of the digital transformation in the new normal.



His Excellency the Right Honourable Prime Minister Ambrose Mandvulo Dlamini presenting on Zoom during the virtual ICT Fair 2020

CS INNOVATION CONTEST – DIGITAL TRANSFORMATION IN THE NEW NORMAL

The year 2020 has seen the world faced with the unexpected COVID-19 virus, causing a pandemic that most, if not all financial institutions were unprepared for. COVID-19 resulted in a nationwide lockdown that limited movement, sales and transaction abilities resulting in revenue loss in the financial sector especially banks. It further impacted interest rates resulting in a reduction, thus impacting customers’ interest earnings. With this, First National Bank Ltd proudly sponsored an innovation contest. The contestants were given a problem to design customer solutions for the Bank that could be used to ensure that neither customers nor the Bank would be affected by another pandemic. The solutions are centred on ensuring that the customer receives maximum value on the earnings, and the Bank is not negatively impacted by a restriction in movements or sales in future. The first prize of E30 000 was won by T-D TECH, second prize of E15 000 won by RED APPLE TECHNOLOGIES, and third prize of E10 000 won by ENGINEERS. The 2020 ICT Fair innovation contest awarding ceremony was held on the 4th of December 2020 at the University of Eswatini, Kwaluseni Campus.



The Programme Director, Ms. Gciniwe Fakudze, with His Excellency the Right Honourable Prime Minister Ambrose Mandvulo Dlamini presenting on Zoom in the background during the virtual 2020 ICT Fair



The Head of the Department of Computer Science, Dr. A Metfula with members of the 2020 ICT Fair organizing committee



Mr. Bongani Ntshangase – EIPA, Prof. Justice Thwala – UNESWA Vice Chancellor, Mr. Maxwell Masuku - PS Ministry of ICT, Ms. Nozizwe Mulela - FNB, Mr. Vumile Dlamini – RSTP and the first prize winners of E30 000 ,T-D TECH group



Mr. Vumile Dlamini – RSTP, Mr. Maxwell Masuku - PS Ministry of ICT, Ms. Nozizwe Mulela – FNB, Prof. Justice Thwala – UNESWA Vice Chancellor and Mr. Bongani Ntshangase – EIPA posing with the winners of the ICT Fair 2020 Innovation Contest



Mr. Maxwell Masuku - PS Ministry of ICT, Ms. Nozizwe Mulela - FNB and the second prize winners of E15 000 ,RED APPLE TECHNOLOGIES group



ICT Fair 2020 winners group photo



Mr. Maxwell Masuku - PS Ministry of ICT, Ms. Nozizwe Mulela - FNB and the third prize winners of E10 000, ENGINEERS group



The UNESWA CISCO Academy which is a partnership between UNESWA (Department of Computer Science) and Eswatini Post and Telecommunications Corporation (EPTC), was resuscitated in the year 2019 and has been fully operational ever since. Its main aim is to offer computer networking training to students, it entails setting-up, maintaining and troubleshooting a network of a small-to-medium enterprise. The 2020 UNESWA CISCO graduation ceremony was held on the 25th of December 2020 at the University of Eswatini, Kwaluseni Campus. There were forty-two (42) graduates in 2020. The event was attended by Ms. Zanele Dlamini - Director, UNESWA CTC, Mr. Petros Dlamini - MD EPTC, Prof. Justice Thwala – UNESWA Vice Chancellor, Mr. Thulani Fakudze - Director Technical Services, ESCCOM, Rep of PS Ministry of ICT.



EPTC's MD, Mr. Petros Dlamini making his remarks during the graduation ceremony



From right: Ms. Zanele Dlamini - Director, UNESWA CTC, Mr. Petros Dlamini - MD, EPTC, Prof. Justice Thwala – UNESWA Vice Chancellor, Mr. Thulani Fakudze - Director Technical Services, ESCCOM, Rep of PS Ministry of ICT



One of the UNESWA Cisco academy graduates making his remarks during the graduation ceremony



Prof. Justice Thwala – UNESWA Vice Chancellor, making his remarks during the graduation ceremony



Prof. Justice Thwala – UNESWA Vice Chancellor and Mr. Petros Dlamini - MD, EPTC posing for the lenses with the 2020 UNESWA CISCO academy graduates



UNESWA Management (Prof. Justice Thwala – UNESWA Vice Chancellor, Prof. Gadaga – UNESWA PVC Academic, Dr. Simelane- UNESWA Registrar) posing with EPTC Management (Mr. Petros Dlamini – MD, Ms. Sharon Maziya – GM Corporate Services, Mr. Vusi Magagula – GM IT, Mr. Francis Dlamini – GM Telecommunications)

CISCO ACADEMY TRIP TO NELSON MANDELA METROPOLITAN UNIVERSITY

One of the requirements by CISCO for Academies is that they should affiliate with an Academy Support Center (ASC) and with our Academy we chose the Nelson Mandela Metropolitan University (NNMU). The aim for this according to CISCO is that they (ASCs) will provide training, coaching, mentorship and support to the Academies. The training includes amongst other things the training of Instructors, training of professionals' certain courses that may be useful locally and internationally, i.e. cybersecurity, IoT, etc. Also, the ASC helps with training when there is a syllabus change. This involves advising academies on how to migrate to the new syllabus plus training on new skills and techniques as well as how to operate new devices.



In 2020, on the 26th of February, CISCO enrolled a new syllabus for its networking courses (CCNA, CCNP, CCIE, etc.). This meant that all Academies should start teaching the new syllabus as the old one was discontinued. It is for this reason that the UNESWA CISCO Academy team, which included 3 members of the Computer Science Department and 3 members of EPTC embarked on a trip to NNMU on the 10th of February 2020 to the 14th of February 2020. The team comprised of Administrators and Lecturers of the Academy and the main purpose of the trip was to benchmark with them on several things that concern our Academy.



Mr G. Kudyachete - CICSO trainer of trainers, Nelson Mandela Metropolitan University, and UNESWA CISCO academy trainers

Dr. A.S. Metfula – Head of the Department of Computer Science, UNESWA, Mr. G. Kudyachete - CICSO trainer, Nelson Mandela Metropolitan University and UNESWA CISCO Academy members



Dr. A.S. Metfula, with the CISCO trainer from the Nelson Mandela Metropolitan University, Mr G. Kudyachete, and other UNESWA CISCO Academy members



Dr A.S. Metfula - Department of Computer Science, UNESWA, Ms F. Dlamini - UNESWA CISCO Academy, Mr. Themba Mavimbela - EPTC



The EPTC team that are part of the UNESWA CISCO Academy who attended the training, Mr. Themba Mavimbela, Ms. Fulatsa Sibanyoni, Mr. Nhlanhla Shabangu



Mr. Sifiso Sithole - UNESWA CISCO Academy trainer, with Mr. Nhlanhla Shabangu – ETPC and Mr G. Kudyachete- CICSO trainer of trainers, Nelson Mandela Metropolitan University



In the year 2020, the Centre for Sustainable Energy Research continued to contribute to national and international research, and enhancing UNESWA's profile through numerous projects. These projects are detailed below.

H2Atlas Africa Project

The H2ATLAS Africa Project is coordinated by Southern Africa Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL) for the Southern African Development Community (SADC) region with the Centre for Renewable Energy and Energy Efficiency (SACREEE) as a key stakeholder. It is funded by German Federal Ministry of Education and Research (BMBF). The CSER is part of a consortium of research institutions in SADC identified to carry out the work on exploring the production of hydrogen using renewable energy resources. Hydrogen is a clean and flexible energy carrier. It can be used in a variety of applications electricity generation using fuel cells; vehicle transportation including cars, truck and buses; aircraft; combined heat and power plants; industrial uses and others. Hydrogen energy systems are highly efficient and only produce water and heat as a by products and therefore do not pollute, and suitable for sustainable development growth. The theme of this project is *“Go Green Go Africa: Germany-Africa Partnership for sustainable energy solution through green hydrogen.”*

Greenhouse Gas Mitigation Assessment to Inform the Update of Eswatini's Nationally Determined Contribution (NDC)

This project was to conduct energy sector mitigation analysis to determine the amount of greenhouse gas likely to be emitted by the country up to 2030. In addition, it is to develop mitigation scenarios for the reduction of GHG gases for alignment with commitments made by the country in its NDC in 2015. The project was implemented for the Ministry of Tourism and Environmental Affairs and was funded by UNEP – Climate and Clean Air Coalition, in Paris France. This project is partial fulfilment of the commitments made by the Kingdom of Eswatini to the Paris Agreement.

Regulatory Impact Assessment of Phasing Out Inefficient Lighting in Eswatini

This work involved the assessment of the available lighting devices in retail stores in all the regions of the country, and installed systems in the residential sector and in municipalities. The data collected included the quantities of the mentioned products and their price. This information was used to determine the impact of phasing out inefficient lighting to the supply side (retailers, wholesalers, importers and the electricity utility), the consumer side (residential and municipalities) and the regulatory side (Eswatini Energy regulatory Authority, Ministry of Natural Resources and Energy, Eswatini Revenue Authority, and Customs and Excise Officials) . Cost-benefit analysis was also conducted. Existing relevant legislation were reviewed and suggestion was made for further regulation required. Options were provided for phasing out inefficient lighting. The project was funded by the Eswatini Energy Regulatory Authority. It is part of Regional Programme to eliminate inefficient lighting in the region and to protect countries from the dumping of inferior lighting technologies.

Donation of Equipment to the Centre for Sustainable Energy Research by Ubombo Sugar Limited

In February 2020, Ubombo Sugar Limited (USL) donated equipment to the Centre for Sustainable Energy Research. The equipment included a desktop computer system with a colour printer/scanner, an overhead projector, and an air conditioner

Presenting the items was the Chief Executive Officer of USL, Mr. Oswald Magwenzi, accompanied by the Environment manager Ms Hlelile Ginindza and the Cogeneration Manager Mr. Machawe Ndlovu. The donation was accepted by the Vice Chancellor Professor Justice Thwala, in the presence of the Registrar, Dr. Salebona Simelane, the Dean of the Faculty of Science and Engineering Prof. Sandile Motsa and the Coordinator of the CSER Dr. Mduduzi Mathunjwa.



The Chief Executive Officer of USL – Mr. Oswald Magwenzi posing with the VC – Prof. Justice Thwala, Registrar – Dr. Salebona Simelane, Dean of FOSE – Prof. Sandile S. Motsa and CSER Coordinator – Dr. Mduduzi Mathunjwa



The Chief Executive Officer of USL – Mr. Oswald Magwenzi handing over the donation to the VC – Prof. Justice Thwala, while the Registrar – Dr. Salebona Simelane and CSER Coordinator – Dr. Mduduzi Mathunjwa look on



Dean of FOSE – Prof. Sandile S. Motsa, expressing a point to the VC – Prof. Justice Thwala, the Chief Executive Officer of USL – Mr. Oswald Magwenzi, the Registrar – Dr. Salebona Simelane, and CSER Coordinator – Dr. Mduduzi Mathunjwa



CSER Coordinator – Dr. Mduduzi Mathunjwa addressing the Chief Executive Officer of USL – Mr. Oswald Magwenzi with his team, while the VC – Prof. Justice Thwala looks

BIOLOGICAL SCIENCES DEPARTMENT

The Biological Sciences Department was instrumental in setting up the Eswatini COVID-19 dashboard, and two members (Dr. S. Padidar and Prof. T.A. Mahlaba) sat on the UNESWA Scientific Research Committee on COVID. Dr. Padidar also sat on the Surveillance, Data Management, and Modelling Technical Working Group of the Ministry of Health. The department collaborated with the Department of Physics in conducting an online survey on compliance to COVID-19 prevention measures.

ELECTRICAL AND ELECTRONIC ENGINEERING DEPARTMENT

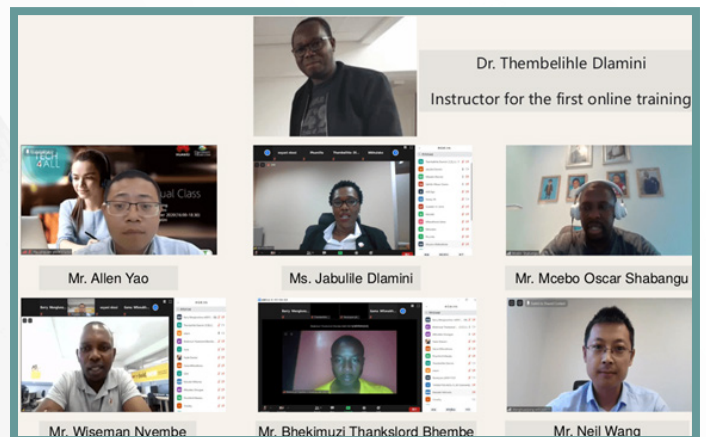
During the pandemic, the department of electrical and electronic engineering partnered with Huawei technologies to set up the Huawei ICT Academy on the 8th of August 2020. The Huawei ICT Academy is a non-profit partnership program set up between Huawei and a selection of higher education institutions. It authorizes global universities and colleges to deliver Huawei Certified ICT courses to students. Through the school enterprise cooperation, together with the University of Eswatini (UNESWA, Huawei technologies will provide high-quality ICT training to support industry development. The Huawei ICT academy will offer the following courses: Big Data, Artificial Intelligent(AI), Internet of Things (IoT), Cloud Computing, Cloud Service, Storage, Intelligent Computing , Routing & Switching, Security, WLAN and 5G. Towards this goal, 5 lecturers were recruited to participate in the program, whereby there were expected to first undergo specialized training and then become Huawei course instructors after passing the prescribed exams.

To enable ICT skills and knowledge growth among the students, and industry partners, the department have launched the first virtual class and carried out the first online ICT course (5G technologies) in November 2020. The first course was offered by Dr. Thembelihle Dlamini after obtaining his Huawei

Certified ICT Associate (HCIA)-5G certification in October, where Allen Yao, CEO of Huawei Eswatini, presented the 5G certificate. The online course was attended by 22 students, and out of them 10 students were able to pass the exam and the rest were not able to write the exam due to technical issues.



The invitation to the virtual class



Some participants of the first online training moments

The main role of the academy at UNESWA is to:

- Promote ICT Talent Cultivation and Industry Development
- To Deepen High-level Cooperation and Promote Huawei Certification

GEP DEPARTMENT

Sustainable Futures Network, Eswatini Hub

The GEP Department is the host of Sustainable Futures Network, previously referred to as Sustainable Futures in Africa (SFA), Eswatini Hub. Dr. Sizwe Mabaso is currently serving as the hub director, with other members of the GEP Department also actively participating in the activities of the hub. Besides UNESWA, other hub partners include the National Disaster Management Agency (NDMA), Eswatini Environment Authority (EEA) and the Coordinating Assembly for Non-governmental Organisations (CANGO). The Network is primarily hosted in the University of Glasgow, Scotland, and having other hubs, initially in African countries (Nigeria, Botswana, Uganda and Malawi). However, with the change in the network structure, the network is experiencing a global growth, with other hubs being established in more European, South American and Asian countries.

Whose Crisis Project Under the Sustainable Futures in Africa Network

Under the Sustainable Futures, GEP Department is currently undertaking a research project entitled: Whose Crisis?: The Global Covid-19 crisis from the perspective of communities in Africa. The aim of the project is basically to determine livelihood issues post and pre COVID-19 era in Africa. Several countries such as Botswana, Eswatini, Uganda and Nigeria are part

of this project and they have since formed individual country hubs which are working together towards addressing certain issues related to COVID-19. The project hired a research project administrator, Miss Thandeka Ndlela, and project research assistant, Mr. Dane Armstrong. In addition, other members of the GEP Department (Dr. M.C. Joseph, Dr. S.S. Seyama, Dr. S.F. Mamba, Dr. S.D. Mabaso and Prof. H.R. Beckedahl) have actively participated on the project, with Dr. Joseph tasked with managing the project.

In consultative meetings held in September 2020 and November 2020 together with other hub partners, the GEP department identified areas of focus which are: Food insecurities post and pre COVID-19 lockdown; COVID-19 and employment issues; COVID-19 induced temporal (and permanent) job loss and socio-economic issues; Access to water and COVID-19 issues.

Departmental Partnership with ACAT/Lilima Eswatini

The GEP Department continued in the year 2020 to foster and strengthen partnerships with external stakeholders, one being ACAT Eswatini. In December 2020, Dr. S.N. Seyama and Prof. H.R. Beckedahl were invited to the annual year end meeting of the institution held on the 16th December 2020 at Mbuluzi ACAT Conference Centre. In that meeting, Prof. Beckedahl trained ACAT personnel on land rehabilitation. Following from the meeting, GEP Department was invited to work together with



ACAT in their rural rehabilitation project, in the hope of securing further funding from the German BMZ in the future. Furthermore, by the close of the year 2020, the Department was working towards establishing an MOU between UNESWA and ACAT.

Launch meeting on ACAT's Donga Rehabilitation project

A few months earlier, through an invite from ACAT, Dr. S.S. Seyama and Dr. S.D. Mabaso attended a launch meeting of Donga Rehabilitation project as part of Climate Change Resilience Building project at Hluthi, Shiselweni district on the 16th October 2020. The project title is: Strengthening resilience building for selected households in the Shiselweni

and Lubombo regions affected by drought associated with climatic change. It is a three-year project funded by the German Government and implemented by Africa Co-operative Action Trust (ACAT) in seven constituencies in the two Regions. These are: Mpholonjeni, Hlane, Dvokodvweni all in the Lubombo Region. Hosea, Shiselweni 1, Shiselweni 2 and Zombodze Emuva all in the Shiselweni Region. The launch was a pilot project for donga rehabilitation and wetland conservation in specific areas such as Hluthi, Manyiseni Wetland and Mgudwini Wetland. ACAT and the GEP Department are in the process of signing a Memorandum of Understanding to work together in this project in various areas such as capacitating staff members, research and publications of these activities.



Hon. Minister of Tourism and Environmental Affairs, Moses Vilakati, with delegates at conserved Manyiseni wetland



The public participating during the launch meeting on Donga Rehabilitation project as part of Climate Change Resilience Building project at Hluthi, Shiselweni



Wares made with material harvested from the wetlands and upcycled material in display at Hluti, Shiselweni during the project launch

GEP Department Rehabilitation Work in Degraded Areas

The GEP Department has continued to work closely with stakeholders such as rural communities, Eswatini Environment Authority (EEA) and NGOs such as World Vision and ACAT towards the rehabilitation of degraded areas in the country.

In the year 2020, the department was directly involved in three rehabilitation projects, namely, Sigcineni, Ngcayini and Nkonjwa. The inputs and interventions in these communities were varied. Prof. H.R. Beckedahl was invited by World Vision Eswatini to be part of the rehabilitation team working on the project funded by the Eswatini Environment Fund to rehabilitate the degraded road in the Enseleni Area. This is part of the rehabilitation work started by GEP last year and funded by the Environment Fund of the EEA.



Photos of a gully at Ngcayini 1A) before and 1B) after rehabilitation during 2020.



A series of photographs of the gully system in the Sigcineni area threatening the road system (note the road culvert). The rehabilitation is being undertaken by Dept of Public Works, together with EEA/EEF, World Vision , GEP and the community.





PHYSICS DEPARTMENT

Academics Without Borders Project

The Department with the assistance of the Dean, Prof S. Motsa has been awarded a grant by the Academics Without Borders to support a collaboration between the Department and Prof. Peter Berg and his group at the University of Alberta. The collaboration will focus on the development of ebooks for Computational Physics based courses using interactive environment such the Jupyter environment platforms.

The Department has recently launched programme is the MSc in Computational Physics that is offered by the Physics Department. This programme include one year of coursework and a final year of research work. The coursework includes an ambitious and cutting-edge list of courses in computational physics and scientific computing such as Quantum Computing, Computational

Statistical Methods, Tools for High Performance Computing, Numerical Weather predictions, and Computational Nanoscience. The collaboration will enhance the profile of UNESWA within the field of Scientific Computing, and modernize our teaching and learning using interactive online content.

The two year AWB funded project will also include a short-term travel by University of Alberta volunteers to the Kingdom of Eswatini.

The AWB is a a non-profit organization whose mission is to support Capacity building in Universities in the developing countries by funding partnership project between local expertise and expert volunteers from Canada. The project is an outcome to the application by Prof. Motsa, Dr S. Nkambule and Prof. Mkhonta on the AWB call for proposals in October 2020.

DEMYSTIFYING THE SEXUAL OFFENSES AND DOMESTIC VIOLENCE ACT (SODV) 2018 SEMINAR: EMPOWERING UNIVERSITY OF ESWATINI STUDENTS TO EMPOWER THEIR COMMUNITIES

On Friday 06th March 2020, the Department of Geography, Environmental Science and Planning through the funding to the tune of about E20, 000.00 that Dr. M.C. Joseph received from the UK Commonwealth Scholarship Commission under its Alumni Community Engagement Fund 2019-2020 organized an awareness raising educational seminar. This seminar was held in the University Sports Emporium, and was organized to familiarize and popularize the newly enacted Sexual Offenses and Domestic Violence Act of 2018 (SODVA) to the students of the University of Eswatini. It was intended to raise awareness and dispel negative stereotypes that are attached to the SODVA. The event involved presentations by different stakeholders from within and outside the University on different topics that relate to sexual and gender-based violence. The keynote speaker for the event was Hon. Themba Masuku, the Deputy Prime Minister of the Kingdom of Eswatini. The speakers equipped the attendees with important information to start appreciating the role progressive legislations such as the SODVA play towards the attainment of gender equality and empowerment of women and girls across the Commonwealth.

This event was initially targeted only to students, but it became popular to both students and staff of the University of Eswatini. The event was initially organized to be attended by only 180. A number of students and staff members contacted the organizer requesting for permission to attend the event. On the basis of this and in line with the regulations of the University of Eswatini, an informed decision was taken two days before the event to make attendance open to anyone who is willing. University staff members and the invited guests were not required to register. A total of 306 students registered to attend the event including 16 executive committee members of 7 students clubs and societies who were specially invited to attend due to their roles as student leaders.

The high-profile opening ceremony was chaired by the Dean of the Faculty of Science & Engineering which saw the following special

guests making remarks/address during the meeting:

1. Welcome Remarks: Prof. J. Thwala, Vice Chancellor of the University of Eswatini
2. Keynote Address: Hon. T.N. Masuku, Deputy Prime Minister of Eswatini
3. Special Address: Ms. N. Ndongo-Seh, UN Resident Coordinator in Eswatini
4. Closing Remarks: Prof. T.H. Gadaga, UNESWA Pro-Vice-Chancellor (Academic)

Other special guests included Prof. P.E. Zwane, UNESWA Pro-Vice Chancellor (Administration), Mr. B. Stewart, Principal Secretary – Ministry of Education and Training, Ms. M. Mndawe, Principal Secretary in the Deputy Prime Minister's Office, Mrs. Masuku, Deputy Prime Minister's wife, Mr. M. Dlamini, Kwaluseni Inkhundla Member of Parliament, as well as Members of the Parliamentary Portfolio Committee on the Deputy Prime Minister's Office.

Thereafter, the technical session of the workshop took place, with the GEP Head of Department, Dr. S.D. Mabaso and GEP member of Department, Mr. I.B. van Zuydam directing and moderating this session.

Presenters from external organizations included Sergeant N. Bhembe - Royal Eswatini Police Service (Matsapha Police Station), Mr. T. Churchyard - Kwakha Indvodza, Ms. S. Nkosi-Nxumalo - Swaziland Action Group Against Abuse (SWAGAA), and Ms. P. Hlatshwayo - Ngwane Teachers College. Internally, presented included Dr S.M. Nyawo – Theology and Religious Studies Department, Mr. S.J.M. Gama - Law Department, Ms. N. Ndwandwe - Student from the GEP Department, Dr. F.S. Shabalala - Community Health Nursing Department, Mr. C.N. Dlamini - Sociology & Social Work Department, and Dr. Z.P. Ncube - Computer Science Department. At the end of the event, Dr M.C. Joseph, Commonwealth Alumni made his appreciation remarks.



Keynote Speeches

In his *welcome remarks*, the Vice Chancellor of the University of Eswatini, Prof. J. Thwala lamented on the seriousness of gender-based violence as a scourge which knows no boundaries. He stated that the University of Eswatini as an institution of higher learning is saddened to be experiencing incidents of gender-based violence. He cited an example of a female student who was brutally attacked by someone who she expected to provide protection to her. The Vice Chancellor went on to indicate that the University is putting measures in place to guide against gender-based violence of all kinds. He mentioned a comprehensive gender policy the University has developed still awaiting approval by the University Council.

In her *special address*, the United Nation Resident Coordinator in Eswatini, Ms. N. Ndongo-Seh congratulated the Kingdom of Eswatini for enacting the SODV Act. She emphasized that this legislation came at the right time to address serious challenges of gender-based violence and high levels of teenage pregnancy the country is faced with. She stated that women and girls are more vulnerable to gender-based violence mainly because of poverty and low levels of education. She said in Eswatini 87 of every 1000 school going girls fall pregnant and drop out of school every year. She said one girl dropping out of school due to teenage pregnancy is too many. She pledged that the UN agencies will continue to support Eswatini to fulfil its development goals.

In his *keynote address*, the Deputy Prime Minister (DPM) of Eswatini, Hon. T.N. Masuku explained how the SODV Act came to be. He stated that the discussions to formulate this legislation started in the year 2000 but it came into fruition almost 20 years after, something which he said is regrettable but commendable at the same time. The DPM stated

that “There are many misconceptions regarding the Sexual Offenses and Domestic Violence Act of 2018 and one of them is that the act is a biased Government instrument in favour of women. I assure you, this Act is not biased but a people’s cantered initiative”. He continued to clarify that the enactment of this Act involved a very comprehensive public consultation process since 2000. He emphasized that the Act was enacted to deal with an unfortunate situation of escalating cases of sexual and domestic violence the country is experiencing. The overall purpose of this legislation according to the DPM is to protect the integrity of the family unit. He said families are no longer a place of safety for almost everyone particularly women and children. He said high incidents of gender-based violence happen within the family context. He said that the Act was enacted to criminalize the so called ‘tibi tendlu’, a traditional norm of not interfering in other people’s family affairs. He said that ‘tibi tendlu’ instead of bringing harmony within families it brought havoc and misery to many families. He said as per the provisions of this Act any person who fails to report wrongdoings he/she witnesses in a neighbours homestead is charged for an offence. The DPM passionately called for men and boys to join him in the fight against gender-based violence. He challenged all men who were in attendance to take time and thoroughly read and understand the Act to avoid perpetuating gender-based violence out of ignorance because ignorance of the law is never an excuse. The DPM ended his speech by requesting the Management of the University of Eswatini to invite him again in the near future to come and engage with the students on this very same topic.



Deputy Prime Minister, His Excellency Honourable DPM, Themba Masuku, exchanging greeting with the UN Resident Coordinator, Ms N. Ndongo-Seh, while the Vice Chancellor, Prof. Justice Thwala and other dignitaries look on



Prof. J.M. Thwala – the Vice chancellor, Prof. H. Gadaga – Pro vice chancellor (academic), Prof. S.S. Motsa – Dean of the FOSE, - PS DPM's Office, together with members of the University awaiting to receive the DPM and UN Resident Coordinator



Prof. S.S. Motsa, the Dean of FOSE, who was the Programme Director for the opening ceremony, with the dignitaries in the background



Dr. S.D. Mabaso, the Head of GEP Department directing the proceedings of the second session of the seminar



Dr M.C. Joseph, the event organizer seated next to Sergeant N. Bhembe and Mr. S. Gama from the Faculty of Social Sciences, some of the speakers on the day

STAKEHOLDERS CONSULTATION FOR PROPOSED NEW PROGRAMMES IN THE COMPUTER SCIENCE DEPARTMENT

The Department of Computer Science held a stakeholders consultancy meeting on the 23rd July 2020 at the University of Eswatini for the proposed MSc programme in Computer Science, BSc. in Health Informatics and Postgraduate Diploma in Computer Science. The stakeholders included the university staff and representatives from the industry and government departments. During the meeting, the proposal was evaluated and comments were captured to revise the programmes. The MSc in Computer Science was approved by the university structures and the Department of Computer Science has admitted the first cohort of postgraduate students.

DONATIONS OF A MOBILE LAB BY ESWATINI COMMUNICATIONS COMMISSION (ESCCOM)

The Department of Computer Science in collaboration with UNESWA's Institute of Distance Education (IDE) drafted a proposal that won funding for the mobile lab. The CS department and IDE received a donation worth over E1 000 000 in form of a Mobile Laboratory which houses 45 high-end laptops. The laptops are currently housed in IDE, and it is imperative to state that every staff member in the Faculty of Science and Engineering is allowed to use the facility for special type of teaching activities and conducting workshops.



Mr. Mvilawemphi Dlamini - Chief Executive, ESCCOM and Prof. Justice Thwala – UNESWA Vice Chancellor during the event

ROYAL ACADEMY OF ENGINEERING PROJECT – WORK-BASED LEARNING KNOWLEDGE EXCHANGE WEBINAR SERIES

A series of eight (8) two-hour knowledge-exchange webinars, facilitated by Dr Patience Dlamini (IDE), took place between 23rd November and 3rd December. The following staff members participated in the webinar series, Mr. Wiseman Nyembe (EEE Head of department), Mr. John Mahlalela (EEE), DR. M.A. Mulatu (EEE), Dr. Zinhle Dlamini (EEE), Mr. J.S. Manongá, Mr. M.J. Khumalo (EEE), Prof C.J.H. Fowler (CELT), Dr K. E. Mthethwa-Kunene (IDE), Prof. Boluwaji Akinuwesi (CS), Mr S. Shezi (Commerce). The series focused on “Considerations in how to design a work-based learning programme in Engineering” with an aim of codesigning and mounting a work-based learning programme in the University of Eswatini;

see schedule at end for details on webinars. Webinars were led by a range of presenters from Glasgow Caledonian University (GCU). The core concepts covered in the webinars are summarised in Table below. One of the presenters was Dr. Chris Smith is a Chartered Engineer with diverse Operational, Innovation and Leadership experience in high-technology industries and Higher Education delivering top- and bottom-level improvements. Research interest in innovative operations and andragogy (particularly with employer involvement). Chris is also a programme leader for MSc Applied Leadership and Management.



One of the presenters Dr. Chris Smith



Presentation by Dr Linda Proudfoot on bringing together lecturers and industry Subject Matter Experts



Presentation by Marty Wright



BASS FELLOWSHIP TO THE FIELD MUSEUM

Prof. A. Monadjem received a BASS fellowship to The Field Museum, Chicago (USA) to conduct research on African bat taxonomy. The fellowship was due to run from November 2019 till April 2020, which was cut short by 2 months due to the COVID-19 pandemic. During this time, He examined hundreds of bat specimens that were collected from across tropical Africa. Based on this he was able to do a thorough systematic revision of the family Vespertilionidae, which resulted in the description of two new genera and three new species to science. This work was published in the Zoological Journal of the Linnean Society (see publications list).

Prof. A. Monadjem had one book published, a fully revised, 2nd edition of the “Bats of Southern and Central Africa” (the first edition was published in 2010 and was sold out by 2019). Considering the global COVID-19 pandemic and its links to bats, this book will be of interest to a broad audience and not just to bat biologists. Prof. Monadjem has also completed a 2nd book “Methods for Ecological Research on Terrestrial Small Mammals”, which is due to be published by Johns Hopkins University Press in 2021.

SUMMER SCHOOL ON BIOMOLECULAR SIMULATIONS

Dr. S.M. Nkambule attended the Summer School on Biomolecular Simulations, Hosted by the European Bioinformatics Institute (EMBL-EBI), 22 - 26 June 2020.

AFRICA MATERIALS MODELING TRAINING

Dr. S.M. Nkambule attended Africa Materials Modeling training, Hosted online by The Schrodinger software team, 21-25 September 2020.

PROF. SANDILE S. MOTSA DELIVERS KEYNOTE ADDRESS AT THE NHTFF-2020 CONFERENCE IN INDIA

Prof. S.S. Motsa was invited to deliver the keynote address at the 2nd International Conference On Numerical Heat Transfer and Fluid Flow, (NHTFF-2020) in January 2020 at the National Institute of Technology Warangal, Telangana State, India. The conference featured a wide range of topics related to classical and emerging areas of computational methods in heat and mass transfer and fluid flow for both steady and transient states. Prof. Motsa’s presentation was on the development of app-based technology that can be used in the research of solution methods for non-linear boundary value problems with fluid mechanics applications.



The organizers of the conference handing over a gift to Prof. Motsa for honouring their invite to deliver a keynote address

CIMPA RESEARCH SCHOOL ON FUNCTIONAL ANALYSIS

Dr. G.C. Ugwunnadi attended the CIMPA Research School on Functional Analysis, University of Witwatersrand South Africa, January 12 to February 24, 2020. The research school for postgraduate students and fresh researchers, who are within five years of graduation with their PhD within African universities and universities working in the field of Functional Analysis. The major aim for the school is to introduce the young researchers to different topics in Functional Analysis and give them a broad knowledge on Functional Analysis and its applications. There was also an opportunity for participant to discuss and collaborate with specialist in different areas of functional analysis like Continuous operators on Hilbert spaces of analytic functions, Banach spaces of analytic functions and composition operators, Asymptotic Behaviour of Semigroups, Ordinary linear Differential Operator and Theory of Riesz spaces.

A SURVEY OF SPECTRAL METHODS FOR NONLINEAR DIFFERENTIAL EQUATIONS WEBINAR

Dr. V.M. Magagula was invited as a guest speaker by Brainware University, India and presented on a topic, entitled, "A survey of spectral methods for nonlinear differential equations". The webinar was attended by mathematical Scientist around the world as it was broadcasted via Google meet.



Certificate of appreciation that was presented to Dr. Magagula for his presentation in the webinar

INTERNATIONAL WEBINAR SERIES ON COMPUTATIONAL FLUID DYNAMIC 2020

Dr. V.M. Magagula was invited as a guest speaker by Universiti Teknologi Malaysia, Faculty of Science, Department of Mathematical Sciences. The department of mathematics was hosting the International Webinar Series on Computational Fluid Dynamic 2020 (IWSCFD2020). The event was scheduled to be held on 1st - 3rd September 2020 on a virtual platform. He presented his seminar entitled "Pseudo-spectral methods for nonlinear differential equations". Dr. Magagula was the only speaker from the African continent who was part of the plenary speakers for the seminar above.

UTM UNIVERSITI TEKNOLOGI MALAYSIA

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Prof Dr Razaini Roslan (UTM, Malaysia) An Application of Fractional Derivatives in The Blood Flow Problems	Assoc Prof Dr Sharidan Shafie (UTM, Malaysia) Mathematical Model of Fluid Flow: Issues and Challenges	Dr Kohilavani Naganathan (UKM, Malaysia) Solving Boundary Layer Problems Using The MATLAB bvp4c Function
Dr Vusi Mpendulo Magagula (Uni. of Eswatini, Eswatini) Pseudo-Spectral Methods for Nonlinear Partial Differential Equations	Mr Muhammad Saqib (UTM, Malaysia) Recent Trends and Applications of Fractional Derivatives to Nanofluid Flows	Asst Prof Dr Osama Makkad (Mansoura Uni., Egypt) Simulation of Air Puff Tonometry Test Using ALE Deforming Mesh for Corneal Material Characterisation
Dr Mohd Faisal Mohd Basir (UTM, Malaysia) Scaling Group of Transformations for Boundary Layer Problems	Asst Prof Dr B. Mahanathesh (CHRIST (Deemed to be Uni.), India) Sensitivity Analysis of Nanofluid Flow Problem	Dr Mohamed Nur Hidayat (Hexagon Measurement Technologies Sdn. Bhd.) Introduction to Computational Fluid Dynamics

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FOR ENQUIRIES
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E CERT AND MATERIALS PROVIDED

The flyer for the workshop with the various speakers that presented in it

EIGHTH GLOBAL SOIL PARTNERSHIP PLENARY ASSEMBLY

The Plenary Assembly (PA) constitutes the main venue where all GSP partners come together to make important decisions about the global soil agenda. Dr. Wisdom M.D. Dlamini represented the Kingdom of Eswatini together with officials from the Ministry of Agriculture.

The Global Soil Partnership (GSP) was established in December 2012 as a mechanism to develop a strong interactive partnership and enhanced collaboration and synergy of efforts between all stakeholders. From land users through to policy makers, one of the key objectives of the GSP is to improve the governance and promote sustainable management of soils. The Plenary Assembly (PA) constitutes the main venue where all GSP partners come together to make important decisions about the global soil agenda.

Due to the public health impact of COVID-19, the Eighth Plenary Assembly of the Global Soil Partnership was held in a virtual format (Zoom) on 3 - 5 June 2020. The session was chaired by Ms Floria Bertsch (Costa Rica), the Vice-Chair was Mr Thanawat Tiensin (Thailand) and the Rapporteur was Mr Hans Brand (The Netherlands). Dr. Wisdom M.D. Dlamini represented the Kingdom of Eswatini together with officials from the Ministry of Agriculture.

INNOVATIONS IN DISASTER RISK REDUCTION WEBINAR – 10-11 SEPTEMBER 2020

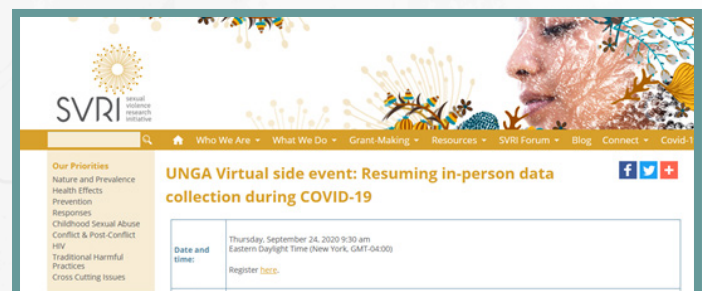
Prof. Heinz R. Beckedahl participated in the International Geographical Union's Webinar entitled 'Innovations in disaster risk reduction: Aiming towards a resilient society' held at the Diamond Harbour's Women's University, West Bengal, India, and presented one of the keynote addresses entitled: "Soil erosion as the 'forgotten' disaster affecting many developing nations". The webinar was held on the 10th & 11th September, 2020. The discussion centred around the fact that soil erosion is a gradual progressing phenomenon whose damage is usually noted when its severe and resulting to loss of massive arable land and pausing threats to agriculture and food security.



A poster of the innovations in disaster risk reduction webinar event

UNITED NATIONS GENERAL ASSEMBLY SIDE EVENT: RESUMING IN-PERSON DATA COLLECTION DURING COVID-19

Dr. M.C. Joseph attended the United Nations General Assembly Side Event: Resuming In-Person Data Collection during COVID-19 Webinar hosted by the Population Council on September 24, 2020, convening global experts to share insights, considerations, experiences and guidance for resuming in-person data collection during COVID-19



Resuming in personal data collection during COVID-19 webinar conference event

The screenshot shows a website interface with a header image of various objects (books, a shell, a package, a spoon, a candle). Below the header is a navigation menu with links: Home, About, Studying Africa, News, Events, People, Blog, Research, Contact Us. The main content area features a seminar series announcement for 'Decolonising Development: Looking Back, Looking Forward' on 16th Sep 2020. The speaker list includes Marion Ouma, Hazel Gray, Sabelo J. Ndlovu-Gatsheni, Pooja Jain, and Robtel Neajai Pailey. A small image of a university building is also visible.

Decolonising Development: Looking back, Looking forward webinar conference event

DECOLONISING DEVELOPMENT CONFERENCE

Dr. M.C. Joseph attended a webinar conference on ***Decolonising Development: Looking back, Looking forward*** hosted by Development Studies Association (DSA) Decolonising Development Study Group, Centre of African Studies, University of Edinburgh on Wednesday, 16 September 2020. The DSA Development Study Group launch event discusses the retrospects and prospects of decolonising development studies and is interested in imagining what a decolonial agenda in Development Studies could look like and what interventions are needed in practice. It was the first of the Centre of African Studies (CAS) Seminar series organised in partnership with the CAS Decolonising Working Group and the University of Edinburgh's RACE.ed.

MEN, MASCULINITIES & FATHERHOOD CONFERENCE

Dr. M.C. Joseph attended a webinar conference on ***Men, Masculinities & Fatherhood Webinar Series***, a four-part interactive webinar series presented by the DSI-NRF Centre of Excellence in Human Development, in partnership with the National Research Foundation (NRF) and Heartlines every Wednesday from 15 July to 12 August 2020 that explored fatherhood in the South African context.

The slide features a collage of images showing fathers and children. The text on the slide includes:

- The State of South Africa's Fathers report 2018**
- A facilitator of a broader narrative on fatherhood in SA.
- An advocacy document, to improve policies and programmes that support father's involvement.
- To track parents' use of parental leave

Logos for HSRC (Human Sciences Research Council), MenCare, and SONKE GENDER JUSTICE are visible at the bottom.

Wessel van den Berg of Sonke Gender Justice's presentation



GENDER IN THE AGE OF COVID

Dr. M.C. Joseph attended a webinar conference on Gender in the Age of COVID webinar hosted by Aspen Global Innovators on August 27, 2020. The conference discussed gender issues and disparities uncovered by the COVID pandemic that managed, in more ways than one, to illustrate how much more we must do to achieve gender equality as envisioned under the UN’s Sustainable Development Goal 5. It looked at the role men can play in redefining gender stereotypes and in reducing gender disparities and the changes that are needed and what might be possible as COVID forces different groups to address these gender disparities. The discussions went on to highlight how masculinity can be defined in the time of COVID-19 which can also help redefine gender stereotypes. The Aspen Global Innovators Group was joined by New Voices Fellow Harish Sadani Co-Founder and Chief Functionary, Men Against Violence and Abuse (MAVA) and Rachel Jones (a contributor for National Geographic Magazine), a Development Media Consultant and a two-time Top 10 Media Writer on LinkedIn.

COVID-19, GENDER-BASED VIOLENCE, AND MASCULINITIES

Dr. M.C. Joseph attended an online dialogue: COVID-19, gender-based violence, and masculinities hosted by MenEngage on May 19, 2020. The dialogue explored the links between masculinities and various forms of gender-based violence that have been exacerbated during the COVID-19 pandemic, including domestic violence against women and girls, or on the basis of sexual orientation or gender identity, and other forms of marginalization. Among the important issues discussed what drives violence, with a particular focus on ideas and attitudes around ‘being a man’, and how men and boys can be engaged in solidarity with women’s rights and other social justice movements during the pandemic to respond to and prevent violence.

TRIUMPHING AS A MAN POST COVID 19 VIRTUAL CONFERENCE

Dr. M.C. Joseph attended a webinar conference on Triumphant as a Man post COVID 19 Virtual Conference hosted by Young Men’s Masterclass on Saturday 25th July, 2020.

INTERNATIONAL CONFERENCE ON MEN AND EQUAL OPPORTUNITIES

Dr. M.C. Joseph attended ‘The 5th International Conference on Men and Equal Opportunities: Men who care’ organised by the Equality Policies Department of the Estonian Ministry of Social Affairs, in co-operation with the Nordic Council of Ministers and European Institute for Gender Equality on 3-4 September 2020. The discussion addressed issues such as *men’s responsibility to care for oneself, care for others, and care for the well-being and sustainability of societies*, including the promotion of gender equality.

NATIONAL DROUGHT PLAN

Dr. W.M.D. Dlamini attended a validation workshop of the National Drought Plan on the 13 August 2020 at the George Hotel. The Ministry of Agriculture, through the United Nations Convention to Combat Desertification (UNCCD) support structures, developed a National Drought Plan (NDP) to help the country ready to deal with issues of drought. The university expertise was sought in the development of this plan which is expected to guide the response to drought in Eswatini.

Dr. W.M.D. Dlamini partook in an online training on soil salinity mapping “Towards the development of national soil salinity maps” organized under the auspices of the African Soil Partnership from 11 to 22 May 2020. The training, which was organized by the Food and Agriculture Organization of the United Nations and the Global Soil Partnership, focused on the use of contemporary geospatial techniques for the mapping of soil salinity and is expected to culminate in the development of national maps and a global salinity map.

FOOD SECURITY & MARKET ACCESS – REGIONAL MULTI-STAKEHOLDER DIALOGUE

FANPRAN and Oxfam Southern Africa invite to a dialogue focusing on initiatives that will mitigate COVID-19 effects on food security!

In partnership with:



Invitation to the Food Security and Market Access regional multi-stakeholder dialogue

FOOD SECURITY AND MARKET ACCESS CONFERENCE

Dr. S.F. Mamba has attended a conference held in Johannesburg, South Africa on September, 24, 2020 organized by FANRPAN and OXFAM focusing on Food Security and Market Access by Stallholder Farmers in Southern Africa. Workshop focused on mapping a way forward in response to the impacts of weather extremes & the COVID-19 pandemic on food security and food systems in Southern Africa. This Regional Multi-Stakeholder Dialogue aimed to develop a call to action bid that serves governments and its partners to invest in initiatives that will mitigate the disruptions of the food system exerted by covid-19 effects and restrictions.

GEOGRAPHIC INFORMATION SYSTEM TRAINING WORKSHOP

Dr. S.F Mamba, Dr. W.M. Dlamini, Dr. S.N. Dlamini and Dr. S.D. Mabaso attended a conference held at The George Hotel on October, 12-16, 2020 the DPM's Office with World Food Programme (WFP) for the member of the Eswatini Vulnerability Assessment Committee (EVAC) core team. On Geographic Information System Training. The workshop focused on the practical application of GIS on food security monitoring and analysis.

ONLINE TRAINING PHASE II: STAGE 3. 'MOODLE & ONLINE FACILITATING TIPS'

Numerous members of the FOSE attended a workshop held at UNESWA, Kwaluseni on September, 09, 2020 organized by the Centre of Excellence in Learning & Teaching (CELT) focusing on Online Training Phase II: Stage 3. 'Moodle & Online Facilitating Tips'. Online Assessment - 'Moodle,' Portfolios, Online Assessment Tools & Identifying OER Sources.

EFFECTIVE USE OF MOODLE AND VIDEO RECORDING TOOLS WORKSHOP

Numerous members of the FOSE attended a workshop held at UNESWA, Kwaluseni on September, 03, 2020 organized by the Faculty of Science and Engineering (FOSE) on Effective use of Moodle, video recording tools and the launching of the Faculty Teaching and Learning Website. The workshop focused on training FOSE staff on the use of moodle video recording tools, video editing and uploading educational videos on the moodle platform

REPORT WRITING AND CONSOLIDATION WORKSHOP

Dr. S.F. Mamba attended a conference held at The Happy Valley Hotel, Ezulwini, on June, 15-27, 2020 organized by World Food Programme (WFP) for the member of the Eswatini Vulnerability Assessment Committee (EVAC) core team. Report writing and consolidation of 2020 Vulnerability Assessment Analysis results to depict the scale & depth of vulnerability in Eswatini.

INTEGRATED FOOD SECURITY PHASE CLASSIFICATION WORKSHOP

Dr. S.F. Mamba attended a conference held at The George Hotel, Manzini, Ezulwini, on February, 26-28, 2020 organized by World Food Programme (WFP) for the Eswatini Vulnerability Assessment Committee (EVAC) core team. Conducting an Integrated Food Security Phase Classification (IPC) & carrying out data analysis and report writing (summary & key messages).

INTEGRATED CONTEXT ANALYSIS (ICA) LIVELIHOODS PROGRAMMING WORKSHOP

Dr. S.F. Mamba attended a conference held at Esibayeni Lodge, Matsapha, on February, 2020 organized by World Food Programme (WFP) on Integrated Context Analysis (ICA) Livelihood Programming workshop aimed at increasing resilience of rural households to food insecurity and natural shocks.

GREEN CLIMATE FUND (GCF) COUNTRY PROGRAMME CONSULTATION WORKSHOP

Dr. S.F. Mamba attended a conference held at Royal Swazi Hotel, Ezulwini, on February, 27, 2020 organized by Ministry of Tourism and Environmental Affairs on Green Climate Fund (GCF) country programme consultation workshop aimed at developing a country programme for engaging the Fund, outlining the needs of the country under climate change and how the funding will be used to address the mitigation and adaptation needs of the country.

CAPACITY BUILDING & VULNERABILITY ASSESSMENT ANALYSIS (VAA) FOR THE ESWATINI VAC TEAM WORKSHOP

Dr. S.F. Mamba attended a conference held at The Happy Valley Hotel, Ezulwini, on January, 13-18, 2020 organized by World Food Programme (WFP) on capacity building Vulnerability Assessment Analysis (VAA) for the Eswatini VAC team in its extended mandate to integrate gender and HIV and AIDS and malnutrition issues to the food security annual assessments. The workshop focused on identification of factors contributing to vulnerability of the Swazi population and capacitating VAC members on data collection tools, data handling and data analysis procedures (including training on CSPro & SPSS) to improve data quality to enhance programming and response options that will inform the design and implementation of appropriate policies and a development of a policy framework aimed at reducing vulnerability of all segment of the Swazi population.

STAKEHOLDER VALIDATION WORKSHOP OF THE REVIEW OF THE STATE OF THE ENVIRONMENT

Mr. M.D. Masilela, Dr W.M Dlamini and Dr. S.F. Mamba attended a stakeholder validation workshop of the Review of the State of the Environment on the 27th of November 2020 at the Royal Villas. The Eswatini Environment Authority (EEA), through support from the United Nations Development Programme (UNDP) was reviewing the State of the Environment Report for 2020. The State of the Environment Report is a tool reporting on causal

factors that influence the country's environment, and the sustainability of the environment. It also highlights potential environmental challenges and recommend intervention mechanisms for the management of the environment. The main thematic areas that stakeholders had to discuss in the review were Land, Water, Atmosphere, Biodiversity, and Human Development.



Participants during the state of the environment stakeholder validation workshop



1. S. Padidar (2020). Health and education in international development: a perspective from Eswatini. St Louis College of Pharmacy, Missouri, USA. January 2020.
2. **A. Monadjem** (2020). The importance of basic biodiversity surveys for conservation in Africa: Challenges facing the training of students in a resource poor setting. The Field Museum, Chicago, USA. 19 February 2020.
3. **S.S. Motsa**, Front end development for research in solution methods for non-linear boundary value problems with fluid mechanics applications, 2nd International Conference On Numerical Heat Transfer and Fluid Flow, (NHTFF-2020), January 17 - 19, 2020, National Institute of Technology Warangal, Telangana State, India (Keynote address)
4. **J. Malinzi**, University of Southampton webinar presentation, 20, May 2020; Title of presentation: The future of cancer treatments: From a mathematical modelling perspective.
5. **Malinzi**, UNESWA COVID-19 research webinar series, 26, October, 2020; Title of presentation: Modelling the dynamics of COVID-19 in Eswatini: Insights from mathematical models.
6. **J. Malinzi**, Faculty of Science and Engineering Online Teaching workshop, 3, September, 2020; Title of Presentation: Moodle page structuring.
7. **J. Malinzi**, Faculty of Science and Engineering Online Teaching workshop, 09 December, 2020; Title of Presentation: Setting up your Moodle Page.
8. **V.M. Magagula**, A survey of spectral methods for nonlinear differential equations, Brainware University, Department of Mathematics, India, 16 July 2020.
9. **V.M. Magagula**, Universiti Teknologi Malaysia, Faculty of Science, Department of Mathematical Sciences, Pseudo-spectral methods for nonlinear differential equations, 1-3 September 2020, International Webinar Series on Computational Fluid Dynamic 2020 (IWSCFD2020).
10. **Akinnuwesi B.A**(2020), Virtual Heidelberg Laureate Forum: Traversing Separation. Organized by Heidelberg Laureate Forum Foundation, Schloss-Wolfsbrunnengasse 33, 69118 Heidelberg, Germany, September 21-25, 2020.
11. **Mbunge E., Akinnuwesi B.A., Fasoto S.G, Metfula A.S and Mashwama P.** Technologies for Tackling COVID-19: Strength and Limitations. Paper presented at UNESWA COVID-19 Research Webinar Series, University of Eswatini, Kwaluseni, Eswatini, October 26, 2020.
12. **Dr. S. M. Nkambule** , “Online School on Ultra Quantum Matter”, Hosted by Permienter institute, Monday, August 10 to Friday, August 14, 2020.
13. **Prof. S.K. Mkhonta**, Invited speaker: Covid-19 Public Health and Social Measures Implementation: A SADC Region Perspective (1, Oct. 2020). Title of the Talk: “Epidemiological models as a support system for an evidence-based response”. This was organized by the Academy of Science South Africa
14. **Prof. S. K. Mkhonta**, UNESWA Covid-19 Research Webinar Series, (28 Sept, 2020). Talk: “Managing Uncertainties: Strategies for navigating the minefield of the Covid.

1. Howard, A., Hirschauer, M., **Monadjem, A.**, Forbes, N., Wolter, K. 2020. Injuries, mortality rates, and release rates of endangered vultures admitted to a rehabilitation centre in South Africa. *Journal of Wildlife Rehabilitation*
2. Kirschel, A.N.G., Nwankwo, E.C., Pierce, D.K., Lukhele, S.M., Moysi, M., Ogolowa, B.O., Hayes, S.C., **Monadjem, A.**, Brelsford, A. 2020. CYP2J19 mediates carotenoid colour introgression across a natural avian hybrid zone. *Molecular Ecology*
3. Stalmans, M., Botha, A., Scott, T., Kaltenecker, G., **Monadjem, A.** 2020. Stork *Leptoptilos crumenifer* breeding in the greater Gorongosa landscape, Mozambique. *Ostrich*
4. Hartfelder, J., Fletcher, R.J., Reynolds, C., Stanton, R.A., Sibiya, M.D., **Monadjem, A.**, McCleery, R.A. 2020. The allometry of movement predicts the connectivity of communities. *Proceedings of the National Academy of Sciences of the USA* 117: 22274-22280.
5. **Monadjem, A.**, Demos, T.C., Dalton, D.L., Webala, P.W. Musila, S., Kerbis Peterhans, J.C., Patterson, B.D. 2020. A revision of pipistrelle-like bats (Mammalia: Chiroptera: Vespertilionidae) in East Africa with the description of new genera and species. *Zoological Journal of the Linnean Society* 191: 1114:1146.
6. Fasel, N.J., Mamba, M.L., **Monadjem, A.** 2020. Penis morphology facilitates identification of cryptic African bat species. *Journal of Mammalogy* 101: 1392-1399.
7. Shapiro, J.T., **Monadjem, A.**, Roder, T., McCleery, R.A. 2020. Response of bat activity to land-cover and land-use change in savannas is scale-, season-, and guild-specific. *Biological Conservation* 241: 108245.
8. Shapiro, J.T., Sovie, A.R., Faller, C.R., **Monadjem, A.**, Fletcher, R.J., McCleery, R.A. 2020. Ebola spillover correlates with bat diversity. *European Journal of Wildlife Research* 66:12
9. **Monadjem, A.**, Guyton, J., Naskrecki, P., Richards, Kropff, A.S., Dalton, D.L. 2020. Cryptic diversity in the genus *Miniopterus* with the description of a new species from southern Africa. *Acta Chiropterologica* 22: 1-19.
10. Ganser, C., **Monadjem, A.**, McCleery, R.A., Ndlela, T., Wisely, S.M. 2020. Is it best on the nest? Effects of avian life-history on haemosporidian parasitism. *International Journal for Parasitology: Parasites & Wildlife* 13: 62-71.
11. Jobson, B., Wolter, K., Jordan, L., **Monadjem, A.**, Rowcliffe, J.M. 2020. Home range and habitat selection of captive-bred and rehabilitated Cape Vultures (*Gyps coprotheres*) in southern Africa. *Oryx* 55: 607-612.
12. Stanton, R.A., Fletcher, R.J., Sibiya, M.D., **Monadjem, A.**, McCleery, R.A. In press. The effects of shrub encroachment on bird occupancy vary with land use in an African savanna. *Animal Conservation* (early view).
13. Clément, L., Dietrich, M., Markotter, W., Fasel, N.J., **Monadjem, A.**, López-Baucells, A., Scaravelli, D., Théou, P., Ruedi, M., Christe, P. 2020. Origins of the protozoan blood parasites of the *Trypanosoma cruzi* clade found in bats from Europe and Africa. *Molecular Phylogenetics & Evolution* 145: 106705.
14. Maphalala, M.I., **Monadjem, A.**, Bildstein, K.L., McPherson, S., Hoffman, B., Downs, C.T. 2020. Ranging behaviour of Long-crested Eagles in human-modified landscapes of KwaZulu-Natal, South Africa. *Ostrich* 91: 221-227.
15. **Sabelo Nick Dlamini**, 2020. Remote Sensing Applications in Disease Mapping [Online First], IntechOpen, DOI: 10.5772/intechopen.93652. Available from: <https://www.intechopen.com/online-first/remote-sensing-applications-in-disease-mappingDlamini>.
16. **Akinuwaesi, B. A.**, Macaulay, B. O., & Aribisala, B. S. (2020). Breast Cancer Risk Assessment and Early Diagnosis using Principal Component Analysis and Support Vector Machine



Techniques. Informatics in Medicine Unlocked, Vol. 21 100459, pp 1-13. DOI: <https://doi.org/10.1016/j.imu.2020.100459> [Elsevier Publishers]

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18. **Akinnuwesi A. Boluwaji**, Adegbite A. Blessing, Adelowo F., Ima-Edomwonyi U., **Fashoto Gbenga**, & Amumeji T Olaseni. (2020). Decision support system for diagnosing Rheumatic-Musculoskeletal Disease using fuzzy cognitive map technique. Informatics in Medicine Unlocked, Vol.18,100279, pp1-19. DOI: <https://doi.org/10.1016/j.imu.2019.100279>. [Elsevier Publishers]

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22. **Mbunge, Elliot, Boluwaji Akinnuwesi, Stephen G. Fashoto, Andile S. Metfula, and Petros Mashwama.** "A critical review of emerging technologies for tackling COVID-19 pandemic." Human behavior and emerging technologies (2020). [Wiley and Sons Publishers]

23. **Mashwama, P., Fashoto, S. G., Mbunge, E., & Gwebu, S.** (2020). Development of a Mobile Inter-Vehicular Communication System Based on Gossip Algorithm. International Journal of Interactive Mobile Technologies, 14(11). [Scopus]

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32. Derrick S. Dlamini, John Michael Tesha, **Gcina D. Vilakati**, Bhekie B. Mamba, Ajay K. Mishra, Justice M. Thwala, Jianxin Li, A critical review of selected membrane- and powder-based adsorbents for water treatment: Sustainability and effectiveness, *Journal of Cleaner Production*, Volume 277, 2020, 123497 <https://doi.org/10.1016/j.jclepro.2020.123497>.
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