



# FOSSE

## Newsletter

2021



ISSUE #4



UNIVERSITY OF ESWATINI

"Science is *magic*  
that works!"

- Kurt Vonnegut



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intends to establish a Water Sustainability Research Centre. These centres are intended to strengthen Eswatini’s research and development capacity, with the aim of actively assisting the government in developing policy and regulatory frameworks; education and training in specialized skills; innovation in sustainable technologies and best practices for socioeconomic development and environmental protection; and offering expert assistance to local organizations by providing research-based solutions.

We congratulate the faculty members who published articles in journals and participated in regional, national, and international conferences and workshops in 2021. The diligent, self-motivated faculty members were able to publish at least 70 peer-reviewed articles in international journals despite supporting their own research out of pocket. Please read this newsletter to learn more about the highlights of FOSE 2021, including research papers, conference presentations, research funds, outreach initiatives, prizes, appointments, and honours. I wish you a healthy and prosperous year in 2022.

- Prof. Sandile S. Motsa

Welcome to the fourth edition of the Faculty of Science and Engineering (FOSE) Newsletter, which is published annually. In 2021, we adjusted to the COVID-19 pandemic and gradually resumed our regular workdays. We appreciate the faculty members who got back up and worked hard to fulfil their obligations, especially in terms of research and community service. It is encouraging to see that the newsletter is jam-packed with articles highlighting the work of the faculty and the ongoing contributions that the FOSE staff make to the communities they serve.

One staff member, Thembinkosi Kunene, who joined the faculty in 2021, is welcomed and introduced in this issue. Mr. Musa Nkambule and Dr. I.S. Kunene, two members of the faculty, retired in 2021. Dr. Christian Okeke, another faculty member, accepted a position at Wits University after leaving UNESWA’s employment. We appreciate the hard work rendered by these colleagues during the course of their lengthy stays at UNESWA.

In keeping with UNESWA’s strategic objective of being responsive to societal needs, the Faculty of Science and Engineering has established the ICT Innovation Hub, another centre of excellence. This brings the total number of functioning centres of excellence to two, after the 2019 launch of the Centre for Sustainable Energy Research. In addition, a concept for the National Climate Change and Sustainability Research Centre has been finalized. If approval for this centre’s establishment is granted, it will open in 2022. In the near future, the Faculty also



Data Analytics which was completed in 2020, also from UP. The Masters research area focused in Spatial Statistics, point pattern and linear structure analysis. His research areas of interest are Statistical and Machine learning, Data science.

*Mr. Thembinkosi Kunene – Mathematics Department*

**M**r Kunene holds a BSc (Actuarial and Financial Mathematics) from the University of Pretoria (UP), having completed in 2017, and a BSc (Hons) in Mathematical Statistics which was completed in 2018. He further holds an MSc in Advanced



### Three EEE department students scope 1st prize in Ematfuba-Ami 2021 Program and win E135, 000.00

On 2nd December 2021, AFRISHOPON Eswatini, a start-up company owned by three final year students from the Department of Electrical and Electronic Engineering, won the 1st prize in the ICT Category of the Ematfuba-Ami 2021 Program. The students are Lindelwa Dlamini, Mpendulo Dlamini and Sphephelo Dlamini. The Ematfuba-Ami Program is an initiative by the Royal Science and Technology Park (RSTP) in partnership with Standard Bank Eswatini and UNDP Eswatini. Eight (8) start-ups founded by students in universities and colleges who were competing for the Ematfuba-Ami program received grant funding amounting to E632,000.00. This means that first prize winners and second prize winners in the students' category secured E135, 000.00 each and E23, 000.00 each, respectively, with Afrishopon winning E135, 000.00 as a 1st prize in the ICT Category.

Afrishopon Pty Ltd, is an online shopping start-up company registered with the Ministry of Commerce founded by three EEE department students. It allows customers to safely buy products online and make payments using visa debit and credit cards as well as MTN Mobile Money from their website [www.afrishopon.com](http://www.afrishopon.com). The company gives a platform for



A certificate acknowledging that Afrishopon is awarded First Prize in the ICT category in the Ematfuba-Ami 2021 Program. Photo Credit/ Sphephelo Dlamini.

local entrepreneurs to sell their products online through their site and allows customers to buy products from international suppliers as well. Afrishopon aims at improving the online retailing business in Eswatini and eventually going beyond the local borders.

When interviewed the founders appreciated RSTP, Standard Bank Eswatini and UNDP Eswatini for organising such a program for college and university student entrepreneurs. They said the grant funding will give the company some stability and allow it to grow. They further appreciated the EEE department for giving them the foundation and skills they needed to start their company.



The first prize winners of the innovation challenge pose after being announced the winners of the E135 000 grant each. Photo Credit/ UNDP Eswatini.



First prize winners pose with RSTP CEO, Mr. Vumile Dlamini, UNDP Deputy Res. Rep. Ms. Shaima Hussein and Ministry of ICT Under Secretary, Ms. Macanjana Motsa. Photo Credit/UNDP Eswatini.

## Appointment of Prof. Simiso K. Mkhonta on the Special Issue on Materials Science in the Global South

Prof. S. K. Mkhonta has been appointed to serve as a member of the Editorial Advisory Panel on the Special Issue on Materials Science in the Global South (more information available at <https://iopscience.iop.org/journal/0022-3727/page/materials-science-global-south>). The purpose of this special issue is to showcase some of the most significant advances in materials

science research from underrepresented countries in the Global South, bringing together researchers from across physics, chemistry, and related fields in materials science. The editorial advisory panel includes colleagues from Brazil, Indonesia, South Africa, etc.

### Editorial Advisory Panel

Fanny Béron, *Universidade Estadual de Campinas (UNICAMP), Brazil*  
 K Khairurrijal, *Institut Teknologi Bandung, Indonesia*  
 Marisa A Frechero, *Universidad Nacional del Sur, Argentina*  
 Nor Aishah Saidina Amin, *Universiti Teknologi Malaysia, Malaysia*  
 Sandro Scandolo, *Abdus Salam International Centre for Theoretical Physics, Italy*  
 Sidney Jurado de Carvalho, *São Paulo State University, Brazil*  
 Simiso Mkhonta, *University of Eswatini, Eswatini*



Prof. S.K. Mkhonta's name on the list of members of the Editorial Advisory Panel for the Special Issue on Materials Science in the Global South, as published on their webpage.



### Appointment of Dr. Sipho Mamba as Vice Chairperson of the Young African Statisticians (YAS)

Dr Sipho F. Mamba was appointed Vice Chairperson of the Young African Statisticians interim committee on the 4th of January 2021 by the African Statistical Elders and endorsed by the Economic Commission for Africa (ECA's Africa Statistics Commission). The YAS is an international organization that brings together over

55 African countries with an aim of building capacity in young professionals in the associated disciplines of Statistics, Demography, Survey Methodology, Statistics Education, Economics, Population Science, Development Studies, Geography and/or GIS, IT/ Data Mining, National Accounts and any other area of influence that contributes to data for development in response the big data initiative, owing to the shift towards more digital technologies, need for improved data for development in light of the UN Sustainable Development Goals and Africa's own Agenda 2068.



Dr Mamba with young statisticians from different parts of Africa during the 5th YAS conference in Pretoria



Some of the YAS country leaders and coordinators parading during the 5th YAS international conference in Pretoria



## The Department of Physics Partners with the University of Alberta (Canada) under the Academic without Borders (AWB) Project

The Physics department submitted a project proposal to Academic without Borders, a non-profit organisation whose mission is to support capacity development in higher education in developing countries so that these countries can educate the experts and professionals that are necessary for their development (more information at <https://www.awb-usf.org/>).

The proposed project facilitates collaboration between the Department of Science from the University of Alberta (under the leadership of Prof. Peter Berg) and the Department of Physics from UNESWA in the field of Computational Physics. This 'UofA-UESwatini' project involves the creation of a free, online computational-physics resource that will consist of a public website that contains learning modules and examples in the field of computational physics and scientific computing. The platform will host downloadable and executable files that any member of the public will be able to access free of



*AWB project proposal invitation poster, taken from the University of Alberta website*

charge. Over time, this will allow for the creation of a reference set of learning modules that any instructor can utilize. The aims of the project are to build capacity within the area of computational physics and mathematical modelling; to create world-class, open, online educational resource through open-source

web applications and to train students and staff on the creation of interactive online content to enhance teaching and learning at UNESWA. Given the current limitations on international travel, the first phase of the project will be conducted through remote collaboration with onsite working visits being planned for late 2022.

Academics without Borders sends expert volunteers from Canada and other countries to support local initiatives. AWB projects focus on several areas including teaching and learning methodology, building research capacity, curriculum and content development for various academic disciplines, student services, and academic support services. AWB's Network is a consortium of Canadian universities and colleges that support AWB's mission. The University of Alberta has been a member of the AWB Network since inception in 2016. The project was introduced to AWB through the October 2020 Call for Project Proposals to Network institutions. Within UNESWA, this work is administered by Prof. S.K. Mkhonta, the Dean of FOSE (Prof. S.S. Motsa), and Dr. M. Matse.

## The Newly Launched M.Sc. in Computational Physics has its First Student Defend their Thesis

Mr. Oscar Mabuza became the first student to defend his thesis in the Computational Physics M.Sc. programme launched in 2019. His thesis, supervised by Dr. Sifiso M. Nkambule, is in the area of Molecular Physics and is titled "Ab-initio Modelling of Molecular Processes Involving the CO system".

Mabuza's work combined structure calculations with scattering calculations to study the reaction dynamic on a potential energy curve either quantum mechanically, utilizing both time independent and time dependent Schrödinger equations, or through the semi-classical Landau-Zener method. Mutual neutralization in collisions of  $C + O^-$  and  $C^- + O^+$  was studied using the semi-classical Landau-Zener method. This theoretical study required computation of non-adiabatic couplings among the



excited electronic states and hence the rotational angle that was used in the transformation matrix. The electronic states were transformed from an adiabatic to a diabatic representation. Cross sections and final state distributions were calculated. The cross section was found to obey Wigner's threshold law at low collision energy. The direct mechanism for dissociative recombination (DR) of CO + was also studied. Scattering calculations using the complex

Kohn variational method were used and Electron capture and dissociation were modelled using a one-dimensional wave packet which was propagated using the Crank-Nicholson propagator. The results showed that the cross section obtained display threshold behaviour, and these were compared to cross sections of other systems. Final state distributions were also calculated for this process.

### UNESWA Strengthens Partnership with National Disaster Management Agency Through the Signing of an MoU



The Dean of FOSE, Prof. S.S. Motsa directing the programme during the ceremony



Seyama, the Director of Early Warning and Research and Mr. Victor Mahlalela, Programs Director.

Through the Department of Geography, Environmental Science and Planning, the FOSE facilitated the strengthening of institutional partnerships between UNESWA and the National Disaster Management Agency (NDMA). The signing ceremony was held on the 22nd April 2021, in the Main Conference Room. Dignitaries from the University included the Vice Chancellor, Prof. J.M. Thwala, Pro Vice Chancellor (Academic), Prof. P.E. Zwane, Pro Vice Chancellor (Administrative), Prof. H. Gadaga, the Registrar, Dr. S.S. Simelane, Dean of FOSE, Prof. S.S. Motsa, and Dr. S.D. Mabaso, the Head of GEP, among others. The team from NDMA which was led by the CEO, Mr. Russell Dlamini, included Mr. Eric

This MOU aims to primarily strengthen partnership between the two institutions to contribute to disaster risk reduction (which I will refer to as DRR in my address), and to limit the impact of disasters associated with natural and manmade hazards on local communities of Eswatini and its economy. The collaboration will further strengthen institutional capacity, while systematically accelerating the national government's efforts aimed at building more sustainable and disaster resilient communities. The long-standing collaborations between UNESWA and NDMA has seen NDMA supporting university research, and in return, the university supporting NDMA with technical support and expertise. The



*The Vice Chancellor of UNESWA, Prof. J.M. Thwala and the CEO of NDMA, Mr. R. Dlamini addressing the meeting, while the other takes notes*

GEP Department in FOSE and the Department of Agricultural and Biosystems Engineering in the Faculty of Agriculture are among the notable departments to have continually collaborated with NDMA. In the height of Covid-19 pandemic, NDMA further collaborated with the Faculty of Health Sciences on Covid-19-related interventions nationally. Examples of initiative where UNESWA is already cooperating with the NDMA through GEP in FOSE include the following:

1. Slope movement hazard mapping and risk assessment of the Highveld region.
2. Use of Unmanned Aerial Vehicles (UAV) and remote sensing technologies for agricultural vulnerability assessments in the Kingdom of Eswatini.
3. The mapping of the extent of burnt areas during the 2019 wildfire, which also included an assessment of the socio-economic and environmental losses incurred.



*The Vice Chancellor and the CEO assisted by Senior Assistant Registrar, Corporate Affairs, Mrs Q.Z. Matse, and the two principal officers exchanging the signed MOU documents*



*The PVC – Academic, Prof. H. Gadaga making the closing remarks during the signing ceremony*



*The Registrar of UNESWA, Dr. S.S. Simelane presenting a gift to the CEO of NDMA at the close of the ceremony*



*A group photo of the senior officers of the two institutions (UNESWA and NDMA) who were part of the signing ceremony*

## UNESWA Strengthens Partnership with ACAT/Lilima Eswatini Through the Signing of an MoU

In the same vein, the GEP Department further facilitated the establishment of an MoU between UNESWA and the Africa Cooperative Action Trust (ACAT), commonly referred to as Lilima Eswatini. The purpose of the MOU which was signed on the 28th of July 2021 is to formalise the already existing partnership between the two institutions, whose aim is to enhance local society, especially by improving the livelihoods of rural people through research and community-based projects and interventions,

an element all the more critical as the nation faces the ever-greater threats associated with the impacts of global climate variability and change. In his remarks, the Vice Chancellor, Professor J.M. Thwala noted that the University, through GEP Department was already engaged on supporting the initiatives of ACAT, with the latest being the partnership and support the department offers ACAT in the environmental conservation and rehabilitative initiative that targets to protect/preserving wetlands and rehabilitating dongas in rural communities that fall within their project areas.



*The Dean of Faculty, FOSE, directing the proceedings of the signing ceremony, while the Executive Director of ACAT, Mr. E. Dlamini and the Vice Chancellor, Prof. J.M. Thwala look on*



*The Head of GEP Department, Dr. S.D. Mabaso, with other members of GEP Department and ACAT representatives during the signing ceremony.*



This collaboration will further strengthen institutional capacity, while systematically enhancing the nation’s efforts aimed at developing more sustainable and disaster resilient communities. To date, the two institutions have already established very good working relations, especially through the GEP Department. These include that the Department has assisted ACAT with technical support and expertise in the form of seminars and workshops on erosion interventions as well as erosion control for ongoing projects, and assisting in collaboration on several joint funding initiatives to support both the rural development endeavors of ACAT,

and the applied research initiatives of GEP on the sustainable utilization of rural environmental resources. In return, ACAT has opened its hands wide and invited UNESWA to participate in project implementation and research in the project themes and locations where the organisation has a presence.

This cooperation will see UNESWA students getting field experience/expertise while undergoing training, while also enabling both ACAT and UNESWA staff and students to share in such collective work through quality academic publications. Through this collaboration, two major forms of cooperation will be sought:



The VC, Prof. J.M. Thwala making his remarks during the signing ceremony



The ED of ACAT, Mr. E. Dlamini making his remarks during the signing ceremony



The Vice Chancellor and the CEO assisted by Senior Assistant Registrar, Corporate Affairs





*The VC, Prof. J.M. Thwala making his remarks during the signing ceremony*



*The ED of ACAT, Mr. E. Dlamini making his remarks during the signing ceremony*

- First, co-operation by staff of both organizations towards further enhancing the service delivery to rural communities throughout the Kingdom of Eswatini, and
- Secondly, collaboration of both staff and students on selected research and development projects with relevant ACAT staff.

Dignitaries from the University included the Vice Chancellor, Prof. J.M. Thwala, Pro Vice Chancellor (Academic), Prof. P.E. Zwane, Pro Vice Chancellor (Administrative), Prof. H. Gadaga, the Registrar, Dr. S.S. Simelane, Dean of FOSE, Prof. S.S. Motsa, among others. The Executive Director of ACAT, Mr. Enock Dlamini was accompanied by two other officers of the organisation, as well as Dr. Samuel Seyama who is a lecturer in the Faculty, but also sits in the Board of Directors for ACAT.



*A group photo of the management UNESWA and ACAT, as well as University officers from FOSE and Corporate Affairs who were part of the signing ceremony*



### Appointment of Dr. Wisdom Dlamini to serve in the Editorial Board of the Global Environment Fund (GEF)

Dr. Wisdom M. Dlamini has been appointed by the Eswatini Environmental Authority (EEA) to serve in the Editorial Board of the GEF fund on the 3rd of January, 2021 in Happy Valley Hotel. 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.



EEA and GEF partnership for environmental protection

### Appointment of Prof. Heinz Beckedahl as an extraordinary Prof at University of Pretoria

Prof. Heinz Beckedahl has been re-appointed by the University of Pretoria, Department of Geography, Geoinformatics and Meteorology as an extraordinary Prof at University of Pretoria in January 2022. This position is a non-salaried position, but it gives the appointee a supervision rights & access to limited research funding. As such, he is currently supervising 3 Swazi PhD students, namely; Mr. Mthobisi Masilela, Ms Thandeka Ndlela and Ms Lungile Sifundza, under this arrangement and appointment.



Prof. Heinz Beckedahl who is serving as an extraordinary Prof at UP



## Appointment of Prof. Heinz Beckedahl to serve on the editorial board of the Journal *Geoökodynamik*

Furthermore, Prof. Heinz Beckedahl was appointed by the Editor-in-Chief, Prof Seuffert, (and reconfirmed when this changed to Prof Gerhard) to serve on the editorial board of the Journal *Geoökodynamik*, published in Göttingen, Germany. This journal is a mid-range refereed publication covering the fields of Geo-ecology and Geomorphology.

## Appointment of Prof. Heinz Beckedahl to chair the UNESCO Eswatini National IGCP (International Geoscience Project) committee

Prof. Heinz Beckedahl has also been elected by the Board of the Eswatini National IGCP committee to chair the UNESCO Eswatini National IGCP (International Geoscience Project) committee, a subdivision of the UNESCO National Committee. This committee meets quarterly to discuss issues coming through from the IGCP. As a result, they have been able to apply for the Malolotja Game Reserve & its surroundings to be declared a Global Geopark, and become part of the Global Geoparks Network. This application was approved and it is now going through the first phase of a 4-year process for it to be officially registered.

## Appointment of Prof. Heinz Beckedahl to serve in the editorial board of the International Journal of Environmental Theory and Practice

Prof. Heinz Beckedahl has been invited by the Chair of the Board of Hannel International (who publish this journal) to join the editorial board of the *International Journal of Environmental*

*Theory and Practice*. Hannel International is an African Environmental Network, based in Harare and in London. This network decided during 2020 to establish a journal, which came to fruition in 2021.

## Other achievements of members of the FOSE include:

- Dr. Lihle Mafu was appointed to the executive committee of the Global Water Partnership Eswatini. Also elected to be the academic focal person for the Water Sanitation and Hygiene forum of Eswatini
- Dr. Lihle Mafu took and passed Coursera courses in writing in the Sciences - Offered by Stanford University through coursera, March 2021, Global Warming I: The Science of modeling climate change - Offered by the University of Chicago through coursera, July 2021, Climate change mitigation in developing countries - Offered by the University of Cape Town through coursera, September 2021, from climate science to action - Offered by the World Bank Group through coursera, December 2021
- Dr. Rose Kibechu received a research grant of dollars 17600, from The World academy of sciences (TWAS) to run for two years (2022-2023). This grant will cover costs for the project titled, "The determination of Contaminants of Emerging Concern in Surface Waters in the Kingdom of Eswatini". This includes; the procurement of research supplies, conference participation costs and open access publishing costs.



UNESWA Cisco Networking Academy is a professional programme run by a team of qualified and competent trainers from the University of Eswatini (UNESWA) and Eswatini Post & Telecommunications (EPTC). The academy certifies technician’s ability to install, set up, configure, troubleshoot and operate a medium-sized routed and switched computer network. So, in 2021 the academy had 22 applicants

for the weekend session and 12 for the mid-week session. Completed students were supposed to have a graduation around December 2021 but due to COVID -19 crisis. Due to the pandemic, 2021 Cisco graduation was postponed to 18 May 2022. However, the academy is currently enrolling students, E6000 per module starting in August 2022. The module covers 12 weeks offered through blended learning.

**2022**

**E6 000.00 per module**

**COURSE STARTING**  
06 August 2022

**COURSE DURATION**  
12 Weeks Per Module

**Online** — **face 2 face**  
**BLENDED SESSIONS**

**COURSE OUTLINE**

- CCNA1 Introduction to Networks
- CCNA2 Switching, Routing & Wireless Essential
- CCNA3 Enterprise Networking, Security & Automation

An advertisement poster for the courses to be offered by the Cisco Academy in the year 2022

1. Earlier this year, the Centre provided training on Solar PV for people associated with the Greening of the Raleigh Fitkin Memorial (RFM) Hospital.

a. This project seeks to remove the coal boiler and inefficient lighting and other inefficient equipment from RFM.

b. The Centre was also assisting the Energy Regulatory Authority (ERA) in developing the regulatory framework for phasing out of inefficient lighting in the country, which is partly the implementation of a SADC resolution on energy efficiency. The project at RFM is in line with this exercise.



*The CSER coordinator, Dr. M.M. Mathunjwa and the Dean of Faculty, Prof. S.S. Motsa, with some of the solar PV workshop participants*

2. The Centre had another project from the Initiative for Climate Action Transparency and the United Nations Office for Project Services. This project had launched the Centre to a new level of funding as it was able to receive over E 2 000 000 of funding.

Eswatini, of the project on “Greening of the Raleigh Fitkin Memorial Hospital”. This project is to make the hospital to have 98% of its electricity generated on site from solar PV and to replace inefficient electrical equipment. The support of the project from the CSER was recognised by in the speeches of the Prime Minister, the Minister of Health and UNDP.

a. For this project, the Centre had engaged twelve (12) Faculty members to assist in the implantation of the project. The members were from three Departments: Physics, Chemistry, Geography, Environmental Science and Planning.

4. The CSER reported in 2020 that the Ministry of Natural Resources and Energy through the support of the United States Agency for International Development (USAID) and the Southern African Energy Programme (SAEP) was embarking on transforming it to a national agency for sustainable energy under the Vice Chancellor’s office, to benefit from increased limelight. The University was slow in embracing this initiative and as a result the consultants involved, Deloitte, are coming to the end of their contract and are winding up. The CSER has since requested MNRE to request support from USAID/SAEP to provide it with capacity building to perform the function of the agency because they are all in line with its objectives as outlined in its founding document approved by the University Senate.

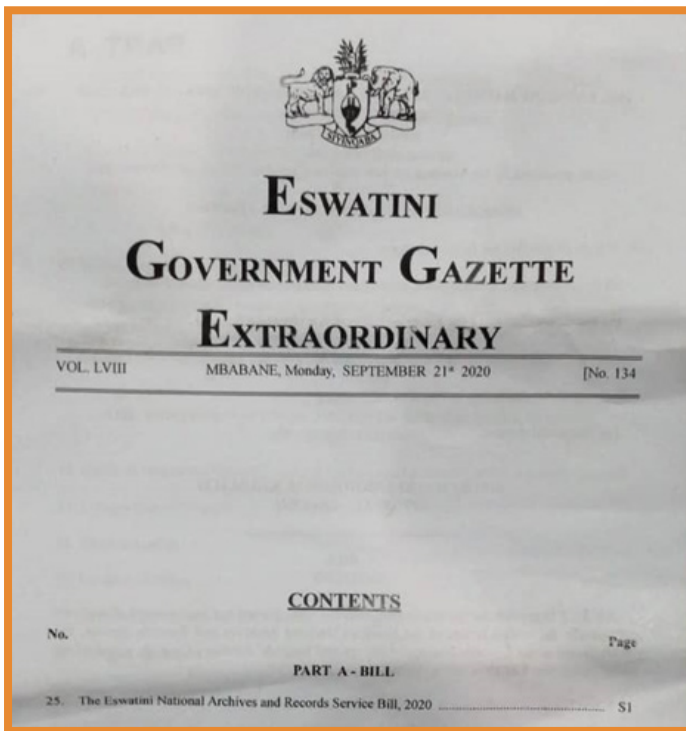
b. This project is to assist the Government of Eswatini to meet its commitments under the Paris Agreement to reduce greenhouse gas emissions that are associated with global warming by a certain amount by the year 2030. The project was called the National Determined Contribution (NDC).

3. In October 2021, the Centre for Sustainable Energy Research (CSER) was invited to the launch, by His Excellency the Right Honourable Prime Minister and some members of Cabinet of the Government of



### Department of Computer Science National Agendas: Eswatini National Archives and Records Service Bill 2020

The Department of Computer Science, through Dr. Vusi Tsabedze, has made submission to Parliament ICT Portfolio Committee on Eswatini National Archives and Records Service Bill 2020. The Bill repeals the Archives Act No. 5 of 1971 archival legislation which has been found to be weak in so far as providing guidance to advance records and archives management agenda in the country is concerned.



The cover page of the draft bill

### Eswatini Deep Learning INDABAX

The Department of Computer Science hosted fourth edition of Eswatini INDABAX 2021 Workshop on the 26th of August, 2021, both virtually (zoom) and physically simultaneously in the New wing Conference Room, Kwaluseni from 9:00 a.m on day one. However, day two of the workshop was conducted face to face for practical sessions on Python applications on financial dataset. The number of participants that attended both virtually and physically are 130. The objectives of this workshop are:

- The growth of the machine learning community in Eswatini.
- Improving the machine learning research potential of students and researchers seeking meaningful knowledge through real-life problems solving techniques.
- Adding local content to the existing machine learning applications.



Deep learning IndabaX attendees listening attentively to Mr. Jeremiah Olamijuwon during the practical session in the New Wing Refectory, Kwaluseni Campus



Mr. Jeremiah Olamijuwon from Eblocks Software, South Africa (Coordinating the Practical sessions)



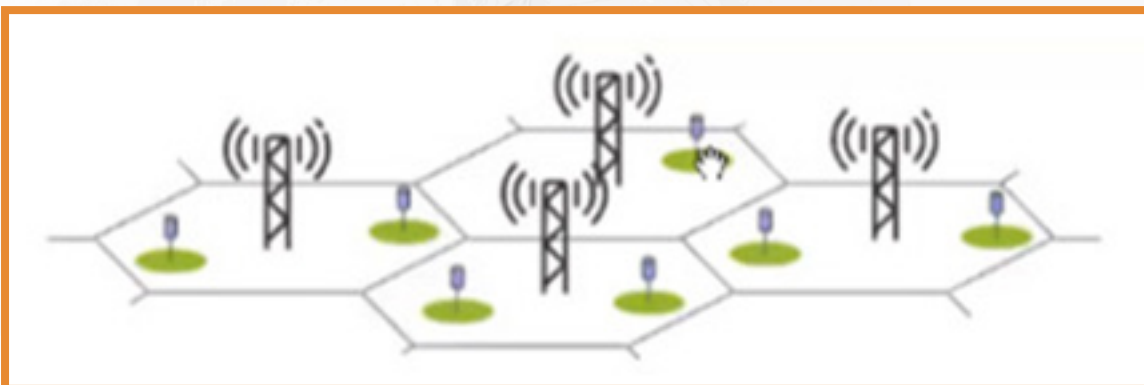
*Prof. J.M. Thwala, the Vice-Chancellor, Prof.S.S. Motsa, Dean of Faculty of Science and Engineering, Dr. A.S. Metfula, Head of Computer Science Department and the participants.*

## Electrical and Electronics Engineering Department

### 5G short course under the Huawei ICT Academy

The department of Electrical and Electronic Engineering has continued to offer the 5G short course under the Huawei ICT Academy which the department setup in August 2020 in partnership with Huawei technologies. 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. The 5G short course covers the basic fundamentals for 5G Mobile Networks (MNs), the improvements from 4G, and the new use cases that are relevant in future MNs. In June 2021, a batch of 30 students joined the course and out of the group only 9 students were able to write and pass the certification exam. The other students were not able to write the exam due to lack of high speed Internet connectivity. In addition, some of the students from the department joined the Huawei ICT Competition, which is a competitive ICT talent exchange event for global college students.



*Part of the content taught during the course showing a heterogeneous deployment with low-power nodes inside macrocells*



Dr. Thembelihle Dlamini addresses Huawei Academy graduates.

Mr. Allen Yao, the CEO of Huawei Eswatini, and the Dean of the FOSE cutting a cake

### EEE Participates in the Women in Engineering (WomEng) Eswatini Workshop

The department of Electrical and Electronic Engineering participated in a workshop hosted by the Royal Eswatini Science and Technology Park in partnership with Women in Engineering (WomEng) Eswatini. The workshop was focusing on the *“Future of Engineering & how students can prepare*

*themselves to fit in this Future”*. Dr. Thembelihle Dlamini represented the department where he shared more information about technological trends, the top 20 skills for 2025, and top 20 jobs of 2025. In the presentation, he further explored the type of skills required such as problem solving, self-management, working with people, and technology use and development.



Royal Science & Technology Park



ADVANCED SCHOOL OF INFORMATION TECHNOLOGY

WomENG  
ESWATINI

WomEng Country Partner

# STEM CAREERS & SKILLS OF THE FUTURE



## CAREERS IN ENGINEERING LIVE ON ZOOM & FACEBOOK

17 NOVEMBER 2021 - 2:30PM - 3:30PM



RES Corporation,  
Head Learning & Talent  
Ms. Sethembile Shiba



Lecturer, UNESWA  
Dr. Thembelihle  
Dlamini

Meeting ID: 824 1766 1652

Passcode: 516172

18 NOVEMBER 2021 - 2:30PM - 3:30PM



MD, Ohm Mech  
Mr. Menzi  
Zwane



Project Manager, Eswatini  
Railway, Ms. Senanile  
Mayabane

Meeting ID: 876 1900 6177

Passcode: 703177

For more information, Contact Sanelisiwe: 2517 9448



Royal Science & Technology Park



RSTP\_Eswatini



rstpeswatini



## Department of Geography, Environmental Science and Planning GEP Department Participates in Research Aimed at Understanding the Effects of Covid-19 Under the Sustainable Futures Network

The Whose Crisis (WC) project is an initiative by the Sustainable Futures in Africa (SFA), now referred to as Sustainable Futures (SF). The Eswatini Hub of SF is based at the University of Eswatini (UNESWA) under the Department of Geography, Environmental Science and Planning, and the project partners are the Coordinating Assembly for NGOs (CANGO), the Eswatini Environment Authority (EEA) and the National Disaster Management Agency (NDMA). The WC team for the SF Eswatini Hub was comprised of Dr. Molefe Joseph (Research Lead), Dane Armstrong (Research Assistant), and Thandeka Ndlela (Research Admin), together with support from Dr. Sizwe Mabaso (Eswatini Hub Chair) and Dr. Deepa Pullanikkatil (Advisor). Additional support for extra facilitation, training and professional services was sourced from community partners and liaisons. The WC project was funded by the Arts and Humanities Research Council (AHRC) under the Global Challenges Research Fund (GCRF). The aim of the year-long project, which ran from September 2020 to September 2021 in Eswatini, Botswana, Malawi, Uganda, and Nigeria, was to amplify the voices of under-represented and under-served communities in Africa and contribute to the understanding of Global Health in a pandemic context.

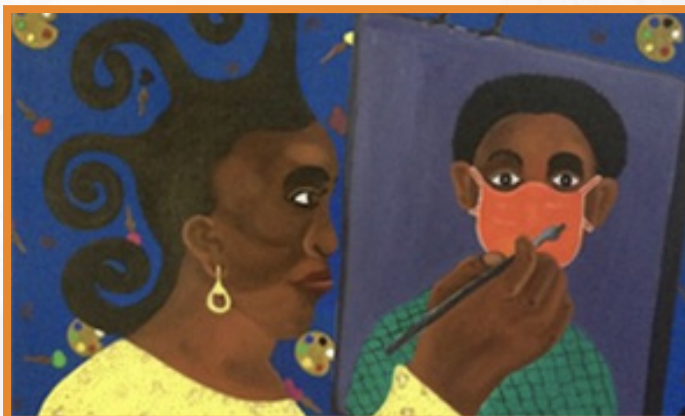


Some participants of the fieldwork by Sustainable Futures (Eswatini)

The two main objectives of the project were:

- To document and communicate the diverse lived experiences of, perspectives on, and responses to, COVID-19 in vulnerable communities in sub-Saharan Africa at a community and household level.
- To share perspectives and experiences in participatory and culturally responsive ways to mobilise both Northern and Southern expertise, resources, and engagement.

The goal was to collect and co-produce qualitative materials generated from a mix of classic and arts-based research methods, ranging from surveys, semi-directed and in-depth interviews, participant observations, audio-visual recordings, photographs, written stories, artwork, and creative workshops. The Research Assistant (RA) collected/co-produced data with selected communities, participants, and partners in line with the appropriately selected methods. All fieldwork observed COVID-19 best practice measures for the health and safety of the research team and participants, and all work was subject to regulatory restriction/adjustment in line with evolving pandemic needs and requirements. Results, material, artwork, and data were collaboratively shared, analysed, reviewed, and curated by the collection of Hubs and the SF project team.





Two main communities were selected for the study studied, one (1) in peri-urban Matsapha - Kwaluseni; and one (1) rural in the Lubombo region - Vuvulane. Mbabane was also used as a research site, with randomised walk-around interviews taking place in particular communities. Direct interviews were conducted with selected organisations that are involved in development work in Eswatini to obtain a wider range of primary information. Documents, reports and statistics were obtained from various development partners and ministries as supplementary secondary data.



Fieldwork and research commenced only once all the permissions, partners and resources had been mobilised and arranged. Data collection occurred both on the ground and digitally, as required/possible. The final plan and execution of this process revolved around the final methods selected, adapting to continued COVID-19 restrictions or barriers. In total there were 18 different sessions held over the course of 21 field trip visits during the project work. These generated a very large amount of data comprised of photographs, video footage, artwork, audio recordings and written reflections. The fieldwork data was then collaboratively shared, reviewed and analysed in conjunction with the rest of the full WC project team in preparation for reports, research papers, public sharing and other co-curated results of the work. The first publication produced can be accessed through this link: <https://openhumanitiesdata.metajnl.com/articles/10.5334/johd.52/>.



*Some participants of the fieldwork by Sustainable Futures (Eswatini)*



## GEP Department Partners with DPMO and WFP to Implement Seasonal Livelihoods Programming in Eswatini

The GEP Department continues to support communities, Government and development partners working in local communities as part of the Faculty and University contribution to society (community service). The Department participated in the implementation of the first Seasonal Livelihoods Programming (SLP) in the country, work done in partnership with The Office of the Deputy Prime Minister (DPMO) and World Food Programme (WFP). This was undertaken between the 11th and

the 15th of October 2021 in Nhlambeni Constituency, with Dr. S.F. Mamba, Dr. S.D. Mabaso and Mr. M.S. Mkhonta representing the GEP Department in the exercise.

The second SLP (which was the country's first urban SLP) was implemented in Mbabane West Constituency, in the Hhohho region of the Kingdom of Eswatini during December 2021. The aim and focus of the programme is to assist both rural and urban communities to develop strategies with tailored responses to respond to local needs and come up with an SLP framework that will inform their development activities.



*Dr. S.D. Mabaso, Dr. S.F. Mamba and Mr. M.S. Mkhonta with participants of the SLP implementation in Nhlambeni Constituency*



*Dr. S.F. Mamba and Dr. S.D. Mabaso during the SLP consultation meeting at Nhlambeni Constituency*



*Dr. S.D. Mabaso, together with Ms Tania, a colleague from Eduardo Mondlane University (Mozambique), facilitating discussions during the breakaway sessions*



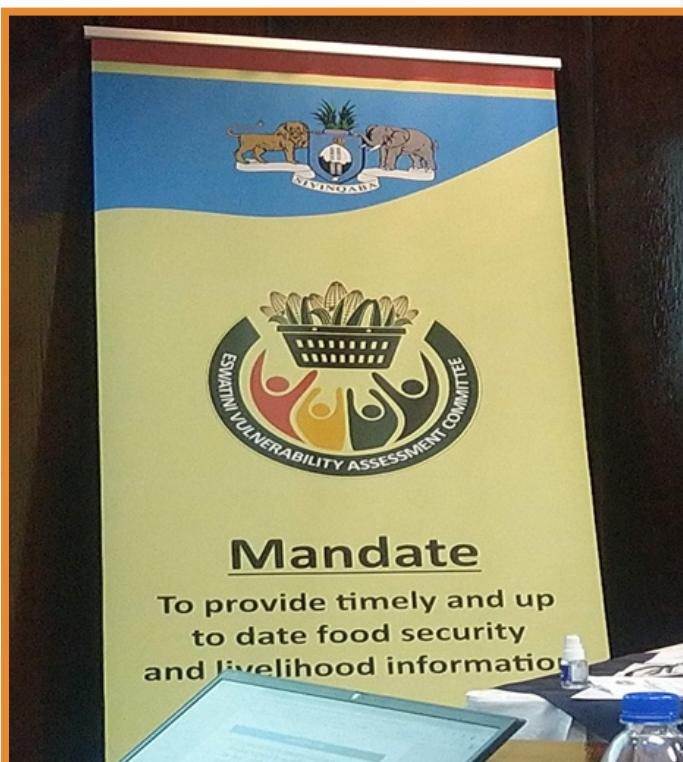
*Mr. M. Mkhonta from the GEP Department participating in a break away session in Nhlambeni during the SLP process*



Dr. S.D. Mabaso, Dr. S.F. Mamba and Mr. M.S. Mkhonta during the SLP in Mbabane West Constituency

Dr. S.F. Mamba participated in the Eswatini Vulnerability Assessment (VAC) Strategic Planning workshop held at the Royal Villas, Ezulwini, Eswatini March 2021. The workshop was organized by the DPMO and focused on crafting the Vision and Mission statement of the VAC, conducting Environmental Analysis in Eswatini (using SWOT analysis) and carrying out the PESTEL analysis, developing thematic areas and strategic information (goals, strategic objectives, etc) and, finally, drafting of strategic plan and validation (in national validation workshop).

Dr. S.F. Mamba participated in the Vulnerability Assessment of Livelihoods & Food Security under Climate Stressors (Drought & Floods) workshop held in February 2021 at the George Hotel, Manzini, Eswatini. The workshop, which was organized by the DPMO, focused on conducting fieldwork on food security, agriculture performance and vulnerability (to drought and floods). Data analysis and conducting Integrated Food Security Content Analysis.



The VAC banner displayed during the Vulnerability Assessment (VAC) Strategic Planning workshop showing VAC Mandate



A section of the Integrated Food Security Content Analysis Report for Eswatini that the VAC team produced



## Yuri Gagarin Lecture hosted by the FOSE

The Faculty of Science and Engineering hosted a lecture to commemorate the 60th anniversary of human space exploration. The presentation focused on the life of Yuri Gagarin, who was the first human being to journey into space on April 12, 1961. The seminar was delivered by embassy officials from the Russian Federation who are stationed in Mozambique.



UNESWA Vice Chancellor, Prof. J.M. Thwala with officials from the Russian Embassy during the lecture

## Department of Electrical and Electronic Engineering Seminar - "Launching your Engineering Career"

On 30th September 2021, the University of Eswatini Engineering Society with the support of the Department of Electrical and Electronic Engineering hosted a seminar under the theme, **"Launching your Engineering Career"**. This was held at the Science In-Service Conference Room at the Kwaluseni Campus. Speakers invited to engage with the students during this seminar were, Mr. Lindani Dlamini, the Chief Technology and Information Officer at MTN Eswatini and Mr. Derrick Mashwama, the Network Planning

and Optimisation Stream Manager for Southern Africa and Central-East-West-Africa at Nokia, South Africa. It is worth mentioning that both speakers are alumni of the Department. The seminar's main objective was to equip students with vital information with regards to starting their Engineering Career.

Some of the issues that the speakers touched on were:

- The importance of aligning your CV to the specific role being applied for and not to just write a generic CV. Another point was on preparing well for interviews, e.g. knowing your CV in an out.
- Skills that employers look for in potential employees, particularly, what sets apart one applicant from another (in terms of employability).
- Continued personal development as a way of boosting ones CV thus differentiating yourself from other graduates and creating your own personal brand.
- Employers' expectations from graduates (contribution to company).
- Being a good team player and the importance of developing soft skills in the work environment.
- Being disciplined, as in some companies no one follows you around to have the job done, but you are expected to meet deadlines and have the desirable outputs.
- The importance of taking initiative in the workplace.
- The importance of networking, nationally and internationally and how this can open up a lot of opportunities.



*UNESWA Vice Chancellor, Prof. J.M. Thwala with officials from the Russian Embassy during the lecture*

On thanking the guests, the students appreciated the time they took to engage with them, and they highlighted the need for more of such seminars. They cited this seminar as being an eye opener for them as it gave them a different outlook on some of the things to be addressed when applying for jobs, employers' expectations and the kind of behaviour they are to exhibit in the work environment.



*Mr. D. Mashwama delivering his talk during the seminar*



*Students listening attentively to the talks during the seminar*



## Dr. Wisdom Dlamini shares Geographical Perspective of Eswatini Covid-19 Waves

Dr. Wisdom Dlamini gave a presentation on the Geographical perspective of the first three Covid-19 waves in Eswatini in a seminar on Data dissemination that was hosted by the Ministry of Health at the Sibane Hotel on the 25th of November 2021. He also highlighted the geospatial science and technology expertise that is available within UNESWA that can contribute to the health sector’s response to epidemiological challenges. The meeting was attended by different local academic institutions, government departments and NGOs that are involved in the health sector including, the Clinton Health Access Initiative (CHAI), WHO, ICAP, CDC/PEPFAR, NERCHA and Baylor Clinic. The objectives of the meeting were to update and share mechanisms used in Covid-19 surveillance, disseminate Covid-19 data, discuss ways of integrating Covid-19 into routine surveillance, and to discuss data results and policy implications.



Dr. W.M. Dlamini making his presentation

## GEP Department Participates in the Whose Crisis Project Virtual Symposium Under the Sustainable Futures in Africa Network

The SF network hosted its 4th major International Symposium via a combination of digital and local meetings between the 19th and the 23rd of April 2021. The symposium was titled: **Sustainable Futures: Reaching Globally to Sustain us Locally**. On the 19th of April 2021, the SF network hosted a public opening session of the session. The general objective was to launch the symposium, celebrate SF’s journey so far, highlight successes and share insights. The SF Eswatini hub hosted its members at the Hilton Garden Inn Hotel so that they could attend the opening session collectively as well as simultaneously hold a hub a meeting to bring everyone up to speed on Whose Crisis activities. In attendance were the Whose Crisis core team members comprising of Dr. Sizwe Mabaso (Eswatini Hub Director), Dr. Deepa Pullanikkatil (Global Network Co-director), Dr. Molefe Joseph (Research Lead), Dane Armstrong (Research Assistant), and Thandeka Ndlela (Research Admin), together with support from, UNESWA project members (Drs Samuel Seyama and Sipho Mamba), representatives from NDMA, the CEO - Mr Russell Dlamini & the Director for Early Warning and Research - Mr Eric Seyama, as well as Ms. Belusile Mhlanga from EEA.



SF Eswatini gathered at Hilton Gardens during the opening session of the virtual global symposium of the Whose Crisis project



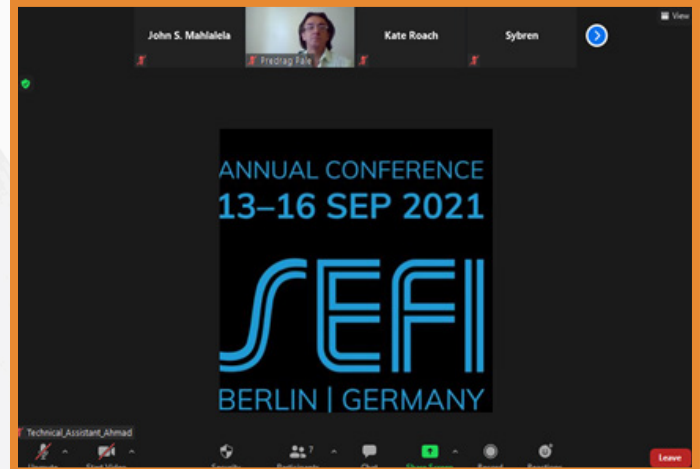
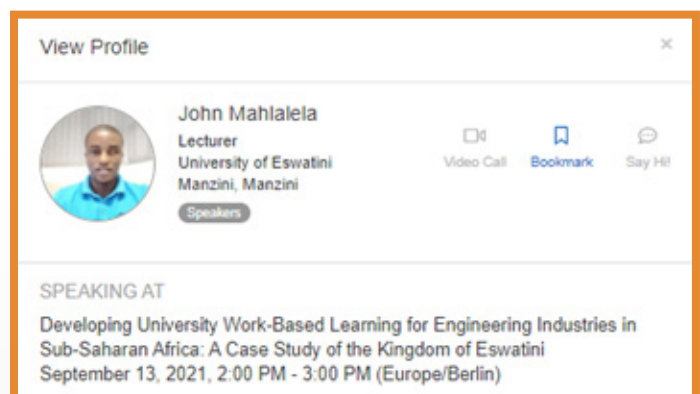
During the opening session, the Director, Dr. Mabaso, made the remarks for the Eswatini Hub to the global network, giving a brief background on how the local hub was established, advances it had made thus far, and who the partners. Then during the local hub meeting, the research assistant, Mr Dane Armstrong, provided an update on on-going fieldwork activities. He shared that community partners in Vuvulane were the Vuvulane Orphaned and Vulnerable Children Outreach Foundation (VOVCOF) - a grassroots community organisation that were instrumental in aiding and proving support to the area both pre- and during COVID. It was also shared that the hub had met with the traditional authority in Kwaluseni and had, in essence, received permission to undertake the planned field activities. Participants agreed that whilst there were a wide variety of societal issues in both communities, there was a great opportunity for the Whose Crisis project to explore the complex lived experiences of community members in the area.

## SEFI annual Conference 2021

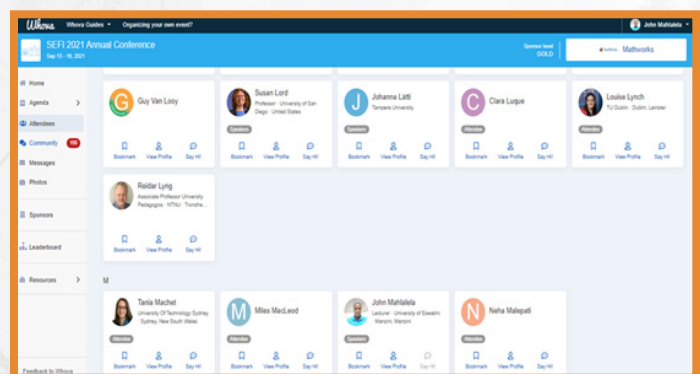
Mr. John S. Mahlalela presented a paper in the SEFI annual Conference 2021. The theme of the conference was **“Blended Learning in Engineering Education: challenging, enlightening – and lasting”** On the 13th - 16th Sept 2021, (Online). The presentation was on the 13th September 2021.



SF Eswatini gathered at Hilton Gardens



A screenshot of the online proceedings



A section of the conference participants

## Competence-Based Education and Training (CBET) Workshop

Mr. John S. Mahlalela attended a workshop on the 2nd – 3rd of November 2021 at Mountain Inn hotel. The workshop was organized by the Taiwan Technical Mission in collaboration with the Directorate of Industrial and Vocational Training (DIVT), the theme of the workshop was **“Introduction to Competence Based Education and Training (CBET)”** which

involves developing unit titles for electrical testing in the Kingdom of Eswatini. A unit standard is a registered statement of desired education and training outcomes and its associated assessment criteria together with administrative and other information as specified by the qualification authority.



Group photo of the Mr. J. Mahlalela with other participants at the completion of the workshop

## Work-based Learning Curriculum Development Workshops

Work-based learning (WBL) is a range of approaches and strategies where individuals learn through a work environment, while also enrolled in an education program that leads to a degree, vocational certificate, or other credential. The department is participating in a series of workshops facilitated by

the Warwick Manufacturing Group and Glasgow Caledonian University in the UK. The objective of the workshops is to empower the engineering staff on the Co-Design Process to enable them to design and pilot a Work-based Learning programme in the Faculty of Science and Engineering through the IDE. The Department is Co-Designing with two companies, EPTC and the Fridge Factory.



Work-based Learning Co-Design Process as of January 2022

## Conference on the Great Debate: What will be the hottest agenda topic at # UN82SC

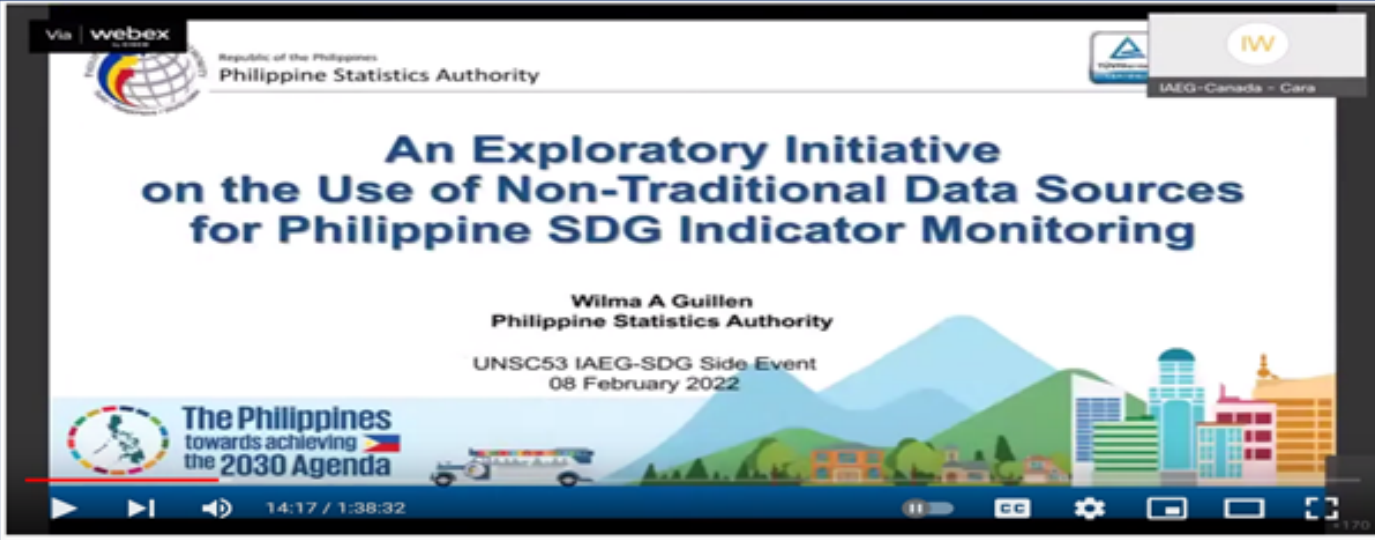
Dr. S.F. Mamba participated in a conference on the Great Debate: What will be the hottest agenda topic at # UN82SC (the United Nations Statistical Commission in 2051?)” organized by the African

Centre Statistics (ECA) held virtually on 10th March 2021. The conference aimed at providing the Young African Statisticians (YAS) a platform to contribute and inform the UN82SC (the United Nations Statistical Commission in 2051) agenda to ensure integration of the views and aspiration of the young and emerging statisticians in Africa to ensure relevance, innovation and full participation of Africa in global conferences.

**Side Event**

**The Great Debate: What Will Be the Hottest  
Agenda Topic at #UN82SC (the United  
Nations Statistical Commission in 2051)?**

*Wednesday, 10 March, 9:15am-10:30am EST (New York time)*



UNSC53 side event: The use of non-traditional data and quality assurance in SDG monitoring

*A section of the presentation by Wilma Guillen (Philippine Statistical Authority) during the conference*

Dr. S.F. Mamba participated in a conference on the link between access to safe and nutritious food and non-communicable diseases in South Africa organized by the Dullah Omar Institute (UWC) held virtually on 18 March 2021. This webinar was part of the Socio-Economic Rights Project (SERP) aimed at exploring the connections between food and diseases and how access to food and food intake can contribute (or prevent) non-communicable diseases.

Dr. S.F. Mamba participated in a conference on the Socio-Technical Innovation Bundles for Agric-Food Systems Transformation: Implications for research and the One CGIAR agenda organized by the International Food Policy Research Institution (IFPRI) held virtually on 19 March 2021. The conference focused on bringing about healthy, equitable, resilient, and sustainable (HERS) food systems and the pressing need to bundle social and technological innovations to accomplish most effectively having self-sufficient and sustainable communities.



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Home / Events

## Webinar: The Link Between Access to Safe and Nutritious Food and Non-Communicable Diseases in South Africa [18 March 2021]

The Socio-Economic Rights Project at the Dullah Omar Institute, University of the Western Cape, invites you to its first webinar in a series on 'Human Rights and Non-Communicable Diseases in South Africa'.

- When Mar 18, 2021 from 02:00 PM to 03:30 PM (Africa/Johannesburg / UTC200)
- Where Zoom (Virtual meeting)
- Contact Name **Keathéla Sapiro**
- Add event to calendar [iCal](#)

Conference call on the link between access to safe and nutritious food and non-communicable diseases in South Africa - Dullah Omar Institute (UWC) on 18 March 2021.



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POLICY SEMINAR

### Socio-Technical Innovation Bundles for Agri-Food Systems Transformation: Implications for research and the One CGIAR agenda

MAR 19, 2021 - 9:30 TO 11:00AM EDT

PODCAST

**Socio-Technical Innovation Bundles for Agri-Food Systems Transformation: Implications for research and the One CGIAR agenda**

from IFPRI

Transformation: Implications for research and the One CGIAR agenda

**INTRODUCTORY REMARKS**  
Johan Swinnen  
Director General, IFPRI

**PANELISTS**  
Channing Arndt  
Director, Economics and Production Technology Division, IFPRI  
Karen Macours  
Chaired professor, Agri-Food School of Economics (PSE), Senior Researcher, French National Research Institute for Agriculture, Food and Environment (INRAE), and Chair of CGIAR's International Food Policy Research Institute

**SPEAKER**  
Christopher B. Barrett  
Deputy Director, Agricultural Development, Global Growth & Innovation

**LINKS**

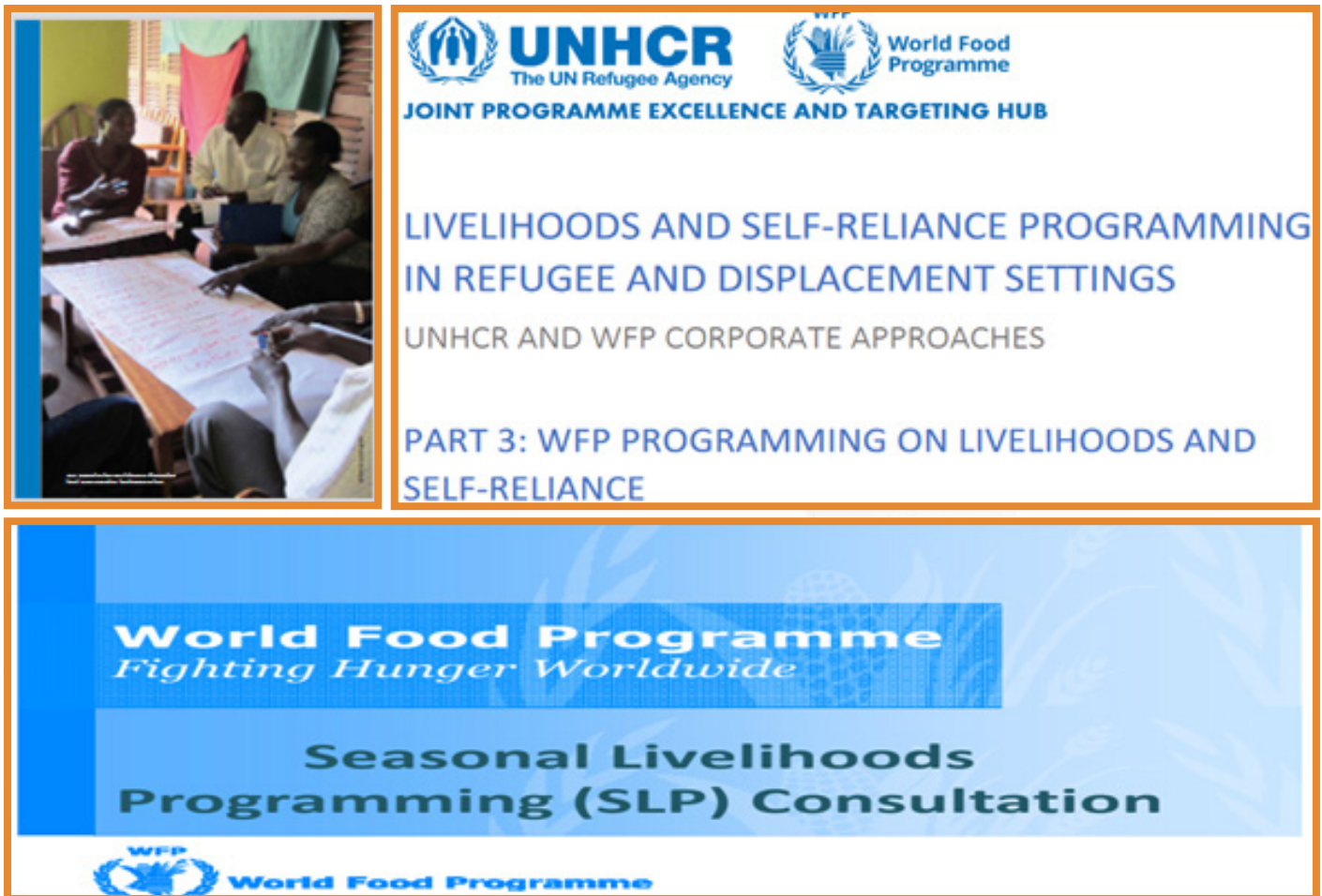
The conference call on the Socio-Technical Innovation Bundles for Agric-Food Systems Transformation: Implications for research and the One CGIAR agenda



## Seasonal Livelihoods Programming Workshops

Dr. S.F. Mamba participated in a Seasonal Livelihood Programming (SLP) workshop organized by the Deputy Prime Minister’s Office (DPMO) & WFP held at the Global Village in Manzini, Eswatini on the 24-

27 August. The workshop was focusing on training of trainers on the SLP training. The SLP aimed to empower trainers to assist communities in developing strategies with tailored responses to respond to local needs. It provides a visual instrument for coordination and tracking activities by local authorities and partners.



The SLP consultation process for hunger alleviation

As a build-up to that, Dr. S.F. Mamba and Dr. S.D. Mabaso represented the country as part of the delegates in a Seasonal Livelihood Programming (SLP) implementation workshop in Uzumba Maramba Pfungwe Rural District, Mashonaland East Province, Republic of Zimbabwe held in Murehwa – Chibanguza Hotel, Zimbabwe on the 26 September to 04 October 2021. The implementation workshop focused on the practical application of the SPL

in UMP to assist the UMP communities develop strategies with tailored responses to respond to their needs and come up with an SLP framework that will inform their development activities. The aim of our visit and participation was to view, participate and learn the practical application of the SLP process in the rural context to assume leadership role in the role out of the SLP process in Eswatini.



*Dr. Mamba and Dr. Mabaso in Chibanguza Hotel, Zimbabwe during the Uzumba Maramba Pfungwe Rural District SLP, Mashonaland East Province, Republic of Zimbabwe*

## Forecast-based Financing (FbF) Technical Working Group (TWG) Workshop

**D**r. S.F. Mamba participated in the Forecast-based Financing (FbF) Technical Working Group (TWG) workshop held at Mountain Inn Hotels, Mbabane, organized by BERCS and the NDMA held on the 14th of December. The overall aim is to participate in the

development and implementation of the Early Action Protocol and provide technical advisory support in the development of the FbF trigger methodology. The workshop allowed for provision of technical advice, provision of input and validation of the FbF approach by identifying opportunities for synergies with other related programs in country, advocating for FbF implementation at national level and providing information/data where practicable and necessary.



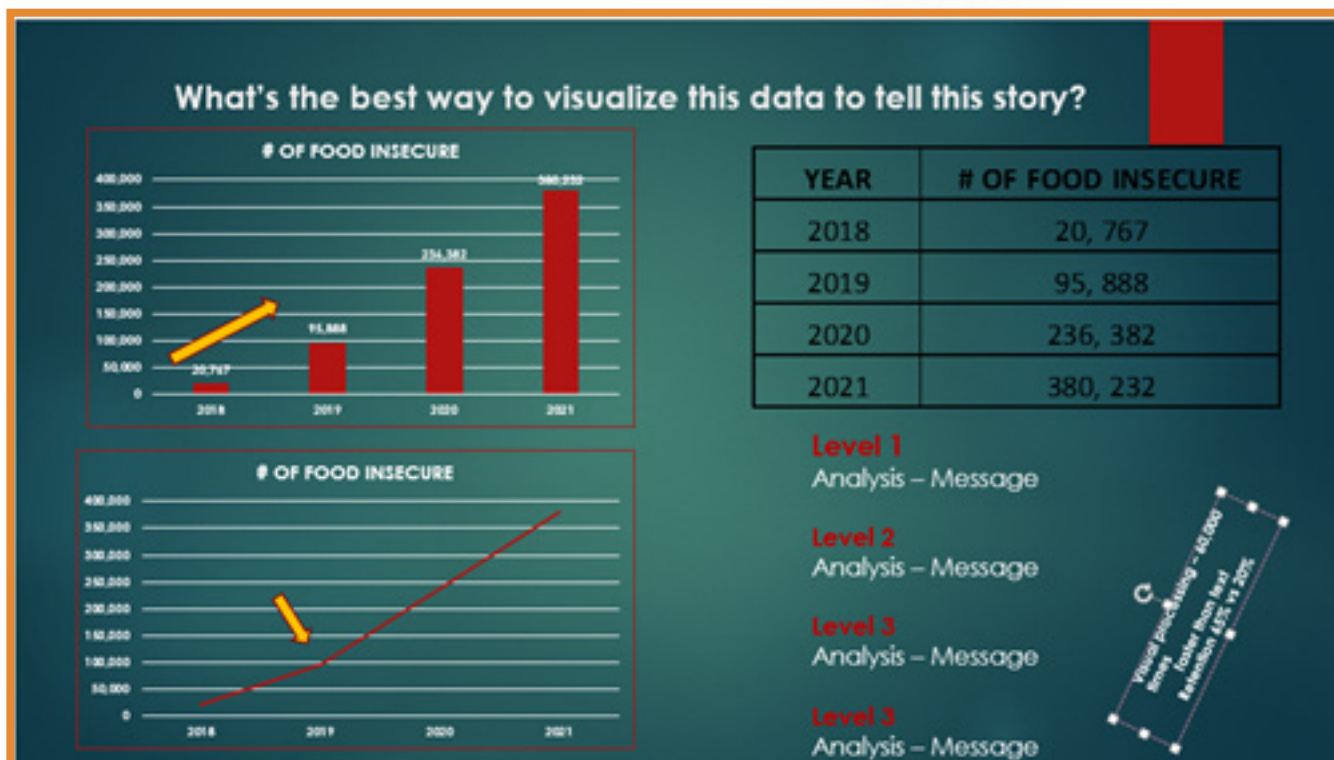
*Some of the delegates during the TWG workshop in Mountain Inn in Mbabane*

## International Sustainable Development Conference

Dr. S.S. Tfwala presented on “The application of object-based classification on large woody debris” in the International Sustainable Development Conference organized by the National Pingtung University of Science and Technology and the Ministry of Science and Technology held virtually on 27-28 November 2020 at the National Pingtung University of Science and Technology (Taiwan). The conference focused on the fact that one of the most significant consequences of extreme torrential events is the production of vast

volumes of large woody debris (LWD). Understanding the status and location of LWD may contribute towards their modelling and in the assessment of whether they would cause secondary disasters.

Dr. S.F. Mamba presented on “Data Analysis and Report Writing to Inform Policy in Eswatini” in Report Writing Workshop organized by the Deputy Prime Minister’s Office (DPMO) on 25 March 2021, Global Village, Manzini. The workshop focused on capacitating the Eswatini Vulnerability Assessment (EVAC) core team on best practices on data analysis and presentation for accurate policy recommendations.



Part of the presentation made by Dr S.F Mamba during the Data Analysis and Report Writing workshop at Global Village to capacitate the Eswatini VAC Core Team




## Workshop on An Analysis of Chronic Vulnerability to Food Insecurity in Eswatini

Dr. S.F. Mamba and Dr. S.D. Mabaso presented on “An Analysis of Chronic Vulnerability to Food Insecurity In Eswatini” in a Chronic Analysis validation workshop held 25-28 January at the George

Hotel in Manzini, Eswatini. The workshop, which was organized by the Deputy Prime Minister’s Office (DPMO) and WFP, was focusing on understanding the state of chronic vulnerability in the Kingdom, to inform policies, strategies and plans aimed at reducing the country’s vulnerability to climate change and other stressors, especially on the country’s food system.



# AN ANALYSIS OF CHRONIC VULNERABILITY TO FOOD INSECURITY IN ESWATINI

**DR S.F MAMBA & DR S.D MABASO**

Part of the presentation made during the Chronic Vulnerability Analysis validation workshop

Dr. S.F. Mamba presented on “Understanding drought forecasts, food insecurity and vulnerability drivers” in the Eswatini Drought Scoping Study Track II validation workshop held in Hilton Garden Inn Hotel in Mbabane. The focus of the conference was on understanding community drought monitoring

systems and how drought is perceived by rural communities in drought prone areas. It also aimed at profiling the levels of food insecurity of the vulnerable groups in drought prone areas and how drought forecasts information reaches communities and how it is interpreted and processed by rural communities.

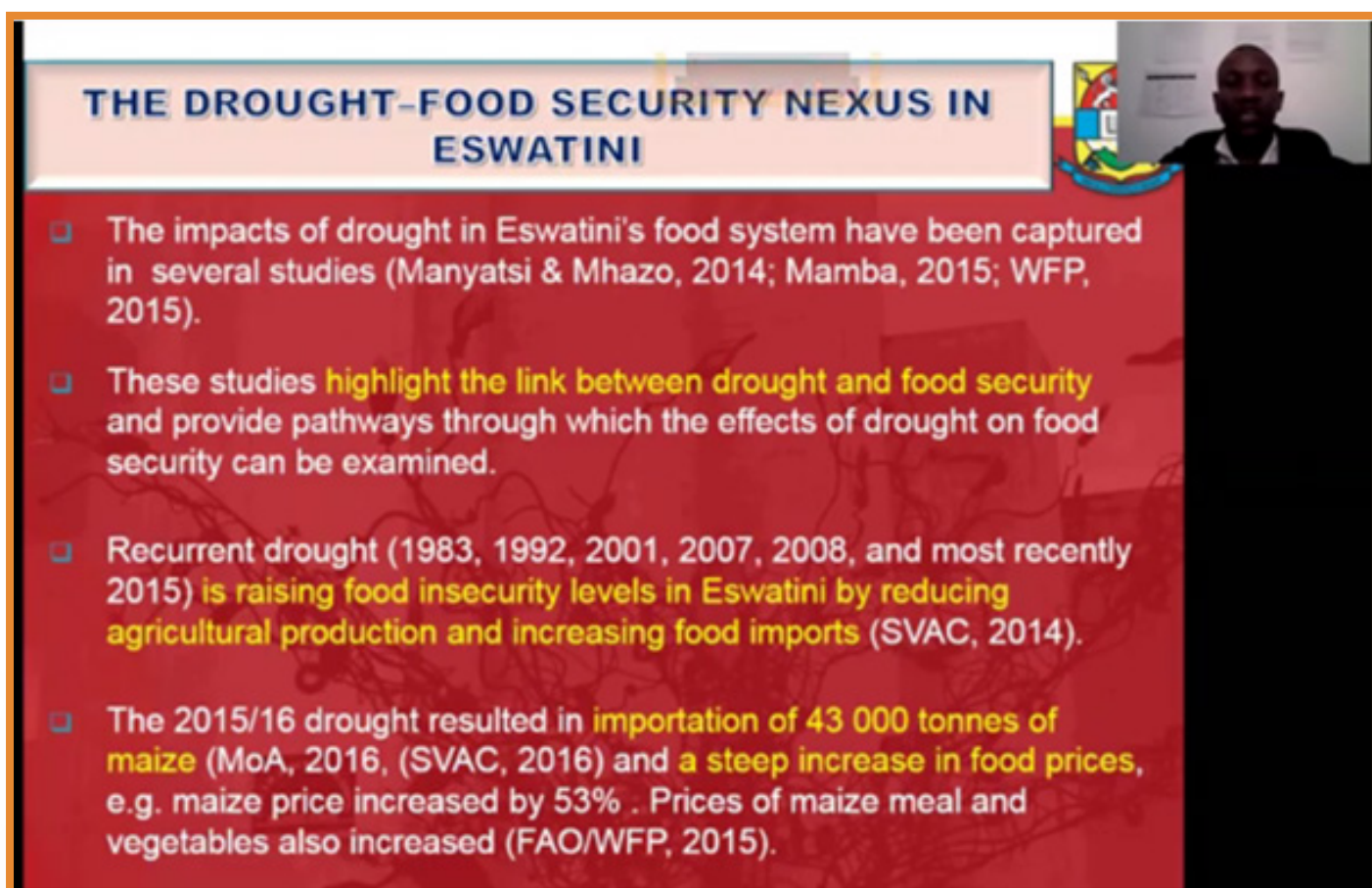


The FbF project coordinator, Coli Ndzabandzaba making a presentation during the validation workshop



Dr. S.F. Mamba presented on “Monitoring the Effects of Drought on Access to Food in Eswatini” in the 63rd ISI World Statistical Congress held virtually from 11-16 July 2021. The international conference and World Statistics Congress was organized by the International Statistical Institute and brought together statisticians and data scientists from academia, official statistics, health sector and business, junior and senior

professionals, in an inviting environment. The inspiring and interactive programme provided the platform to learn about the latest developments in statistical research and practice in an informal ambience. A series of short courses, satellites and other events completed the WSC held virtually and attended by more than 2500 participants from over 130 countries.



Dr. S.F. Mamba making a presentation during the virtual 63rd ISI International Conference

Prof. H.B. Beckedhal participated in the International Geographical Union’s Webinar entitled “Innovations in disaster risk reduction: Aiming towards a resilient society”. The webinar which was held at the Diamond Harbour’s Women’s University, West Bengal, India on the 11th and 12th September, 2020 was organized by Diamond Harbour University. The focus of the webinar was on 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.

Dr. S.B. Seyama participated in the virtual Global Sustainable Conference held on the 8th-10th September 2021 at Martin-Luther University, Halle-Wittenberg, Germany. The Global Sustainability conference aimed to address challenges associated with education, nutrition, urban and rural development and natural and cultural resources management in regards to Climate Action for Sustainable Development by creating a knowledge sharing platform for sustainability.

**Dr. W.M.D. Dlamini** attended a workshop on Red Cross Forecast-based Financing organized by Baphalali Eswatini Red Cross Society and the National Disaster Management Agency held virtually on 11 November 2021 to present a framework for the introduction of forecast-based financing for drought early action responses in Eswatini.

**Dr. W.M.D. Dlamini** attended a workshop on Leveraging Geospatial Technologies for Environmental Health Decisions organized by the United States National Academies of Sciences, Engineering and Medicine held virtually on 14 to 15 April 2021. This workshop explored how recent advances in the resolution of geospatial technologies could inform precision public health—using geospatial data to target health interventions to the right populations at the right time. Participants also considered ethical uses of remote geospatial data and will delve into ways to integrate these data with other environmental exposure data.

**Dr. W.M.D. Dlamini** attended an NCD workshop on Adaptation sectors organized by the Ministry of Tourism and Environmental Affairs held from 12 to 14 May 2021, Hilton Garden, Mbabane to contribute the revision of the Eswatini Nationally Determined Contribution (NDC) under the Paris Agreement through a workshop to discuss and review sector climate risks and vulnerabilities and climate change, adaptation options for WASH and Health sectors in Eswatini, prioritize and refine adaptation options for WASH and Health sectors, identify key barriers and gaps including policy and capacity limitations with regards to climate change adaptation in WASH and Health sectors Eswatini and have preliminary discussions with stakeholders to identify linkages between NDC, Sustainable Development Goals and Sendai Framework.

**Dr. W.M.D. Dlamini** attended a workshop on a Soil Information System for food security & Sustainable Intensification in Africa organized by the Soils4Africa Project team held virtually on 3 June 2021. The aim of the workshop was to discuss strategies to embed the Soil Information System (SIS) for Africa's EU-Africa Research and Innovation Partnership on Food

and Nutrition Security and Sustainable Agriculture (FNSSA) knowledge platform, as a key soil information database that contributes towards effective land use for sustainable agricultural intensification in Africa. Speakers included project team members, as well as key stakeholders from Africa and Europe.

**Dr. W.M.D. Dlamini** attended a SADC Drought Workshop organized by the Southern African Development Community (SADC)/ International Union for Conservation of Nature (IUCN) which was held virtually on 21 June 2021 to discuss a draft SADC Drought Strategy and make inputs to its formulation and implementation.

**Dr. W.M.D. Dlamini** and **Dr. S.D. Mabaso** attended a workshop on Remote Training on the Building of Sustainable National Greenhouse Gas Inventory Management Systems organized by the UNFCCC Secretariat with the collaboration of the US Environmental Protection Agency which was held virtually on 22 to 25 June 2021. The aim of the workshop was to assist countries in establishing or improving their technical, institutional, legal and procedural arrangements to support the planning, preparation and management of national GHG inventories and the reporting requirements under the measurement, reporting and verification (MRV) system and the enhanced transparency framework (ETF) under the Paris Agreement.

**Dr. W.M.D. Dlamini** attended an AfriGEO Virtual Symposium, 2021 organized by the Group on Earth Observations (GEO) and The Regional Centre for Mapping of Resources for Development (RCMRD) which was held on 17 to 19 November 2021. The aim of the symposium was to provide a platform to begin enhancing collaboration and integration by bringing together experts from the technological, social, political, economic, legal and environmental spheres to discuss, unlock and activate the growth of African Industries in Earth Observation and the implementation of the Africa Space Policy.



**Dr. S.S. Tfwala, Dr. S.D. Mabaso and Dr. W.M.D. Dlamini** attended a workshop on Eswatini GHG Inventory Information Management System Virtual Training organized by the United Nations Environment Programme and Ministry of Tourism and Environmental Affairs on 8 to 9 July 2021 to build capacity of key experts on greenhouse gas (GHG) inventory management such as GHG inventory information management, setting up a national MRV system for a national GHG inventory process, operationalization of a national GHG information management system and GHG data documentation and archiving

**Dr. W.M.D. Dlamini** attended a workshop on Eswatini Climate Public Expenditure and Institutional Review organized by the Commonwealth Secretariat through funding from NDC Partnership CAEP support and Ministry of Tourism and Environmental Affairs which was held virtually on 5 August 2021. Its focus was to discuss the CPEIR report produced by the Commonwealth Secretariat.

**Dr. W.M.D. Dlamini** attended the 14th EUMETSAT User Forum in Africa organized by The European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) which was held virtually on 28 to 30 September 2021. The scope of the Forum was the access and use of satellite data for weather and climate services, with a focus on the new Meteosat Third Generation that will be launched at the end of 2022.

**Dr. S.D. Mabaso, Dr. W.M.D. Dlamini and Dr. M.M. Mathunjwa** attended an NDC Validation workshop organized by Ministry of Tourism and Environmental Affairs on 6 October 2021, Esibayeni Lodge to validate the country's Nationally Determined Contribution (NDC) under the Paris Agreement.

**Dr. W.M.D. Dlamini** attended a Global Symposium on Salt-affected Soils (GSAS21) organized by the Food and Agriculture Organization of the United Nations's Global Soil Partnership (GSP) held virtually from 20 to 22 October 2021. The main objectives of

the Symposium was to share knowledge on salinity prevention, management, and adaptation and to establish critical connections between science, practice, and policy by facilitating discussion among policy makers, food producers, scientists, and practitioners for sustainable management of salt-affected soils.

**Dr. T. Ndlovu, Dr. W.M.D. Dlamini, Dr. S.D. Mabaso and Dr. Samkele Tfwala** attended a MRV Governance workshop organized by the Ministry of Tourism and Environmental Affairs held on 16 to 17 December 2021, Hilton Garden Inn, Mbabane. The aim of the workshop was to discuss the formulation of a Monitoring, Review and Verification (MRV) Governance system to implement the Eswatini NDC.

**Prof. B Beckedhal** participated in the International Geographical Union's Webinar entitled 'Innovations in disaster risk reduction: Aiming towards a resilient society' organized by the Diamond Harbour University held on the 10th & 11th September, 2020 in Diamond Harbour's Women's University, West Bengal, India. The focus was on 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 posing threats to agriculture and food security.

**Dr. S.S. Tfwala and Dr. S.D. Mabaso** participated in a workshop on Published Eswatini's First National Adaptation Communication (AdCom) organized by NAP Global Network, International Institute for Sustainable Development, Ministry of Tourism and Environmental Affairs in November 2021, COP26, Glasgow. The AdCom provides information on national circumstances, including institutional arrangements; highlights climate risks, vulnerabilities, and impacts in Eswatini; and elaborates on ongoing and proposed adaptation measures and actions. It further describes barriers and challenges to planning and implementing climate change adaptation, and the support needed by the Kingdom to deliver on its adaptation priorities.

**Dr. Lihle Mafu** attended one-day online workshop hosted by the Water Research Commission (RSA) on “The fate of sanitizers and disinfectants following broad spraying in fight against Covid 19 - An aquatic ecosystem perspective. This one-day workshop was held on the 23rd November 2021.

**Dr. Lihle Mafu** attended the WISA CPD course titled the ‘Introduction to water and wastewater treatment’, which ran on the 2-3 December 2021 (Online training). Then on the 16th of November 2021, he attended the online course WISA and Isle Utilities Course titled ‘Emerging pollutants in water systems’.

**Dr. Sandile B. Simelane** attended the ‘First Commonwealth Chemistry Congress: Partnership for the Goals’. This was a virtual conference which focused on the contribution of Science in achieving the Sustainable development goals by 2030. The virtual three-days conference was held on the 18-20th May 2021, and Dr Simelane presented a flash talk titled, “6-Dialkylaminopyrimidine carboxamides: A novel series of antitubecular agents”.



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2. **Sandile Simelane** (2021). 6-Dialkylaminopyrimidine carboxamides: A novel series of antitubercular agents. The conference took place on 18-21 May 2021, in the conference; *“First Commonwealth Chemistry Congress: Partnership for the Goals”*.
3. **LD Mafu, N Vilakati** (2021). The effect of climate change on water quality - focus on rural water supply in Eswatini (Plenary talk). 6th REMCO Conference, Whiteriver Mpumalanga, 17-19 November 2021
4. **Mengistu Abera Mulatu, Thembelihle Dlamini, Thokozani Shongwe, Mzabalazo Lupupa**, *“Energy Cooperative Transmission Policy for Energy Harvesting Tags”*, International Conference on Electrical, Computer, and Energy Technologies (ICECET), Cape Town, South Africa: IEEE, December 2021.
5. **Mahlalela, John Sabelo**; Dlamini, Patience S.; Smith, Christopher J. M. (2021, September). *“Developing University Work-Based Learning for Engineering Industries in Sub-Saharan Africa: A Case Study of the Kingdom of Eswatini”*. In 2021 SEFI 49th Annual Conference (pp 1016 – 1024). SEFI Proceedings
6. **Dr. W.M.D. Dlamini** (2021). *“Forest Research and Training in Academic Institution - Eswatini”* in a Forest Webinar: Achieving Sustainable Forest Management Through Research and Development In SADC. The conference was organized by the Center for Coordination of Agricultural Research and Development for Southern` Africa (CCARDESA) which was held 17-18 November 2021.
7. **Dr. W.M.D. Dlamini** (2021). *“The first three COVID-19 waves in Eswatini: a geospatial perspective”* in Eswatini COVID-19 Data dissemination meeting organized by the Ministry of Health. The meeting was held on 25th November 2021 at Sibane Hotel and aimed at providing a reflection on the third wave of the pandemic and the interpretation of the data and policy implications.
8. **SS Motsa**, *“On spectral block hybrid methods for evolution and reaction-diffusion systems of partial differential equations”* (Plenary lecture), 39th Annual conference of the Nigerian Mathematical Society, Redeemer’s University, Ede, Nigeria, 20-24th of April 2021.
9. **SS Motsa**, Block hybrid methods for solving systems of non-linear ODEs, UK-APASI, Workshop Series Hosted by the Sussex University, March 15 - 17, 2021
10. **SS Motsa**, Block hybrid methods for solving systems of non-linear ODEs, UK-APASI, Workshop Series Hosted by the Sussex University, April 12 - 14, 2021
11. **SS Motsa**, 13th Annual Workshop on Computational Mathematics and Modelling, University of KwaZulu-Natal, Pietermaritzburg Campus, 5 - 9 July, 2021

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