

BITRI NEWSLETTER

TECHNOLOGY SOLUTIONS

FROM YOU
TO US
FOR YOU



MERRY
Christmas
& HAPPY NEW YEAR

**An Update On
The Botswana
e-Mobility
Programme**

pg 05

**BITRI Participates
in the Dubai Expo
2020**

pg 06

**BITRI
Co-Hosts the Pre-
COP26 Global Youth
Letter Botswana
Chapter**

pg 08



**BOTSWANA INSTITUTE FOR TECHNOLOGY
RESEARCH AND INNOVATION | NEWSLETTER**

TECHNOLOGY SOLUTIONS

FROM YOU
TO US
FOR YOU

TABLE OF CONTENTS

CEO's Foreword	03
BITRI New Board Members Appointments - December 2021	04
An Update on the Botswana e-Mobility Programme	05
BITRI Participates in the Dubai Expo 2020	06
BITRI Co-hosts the Pre-COP26 Global Youth Letter Botswana Chapter	08
BITRI, MOTE, AMRS Host Webinar and Panel Discussion on 9th November 2021	10
BITRI Participates in the 2nd Commonwealth Chemistry Posters Virtual Event	12
BITRI Staff Appointments	14
Coping with end of year fatigue	14

Editorial Team

Chief Editor: Dr. Bathsheba Mbongwe


Editor: Lesego Moribane


Content & Pictures: Frank Rakgomo


The contents of this magazine are fully protected by copyright and may not be reproduced in any form without prior permission of the publisher. All information correct at time of going to press. All rights reserved. The publisher cannot accept liability for errors or omissions.

Botswana Institute for Technology Research and Innovation (BITRI)

 Plot 50654, Machel Drive, Gaborone, Botswana

 (+267) 360 7500

 (+267) 360 7624

 communications@bitri.co.bw

 www.bitri.co.bw

 BITRI  BITRI1640  BITRI



CEO'S FOREWORD

I am delighted to pen the foreword of the last edition of our quarterly newsletter for the year 2021, and I thank you once again for supporting BITRI in its endeavour to fulfil the Vision of developing “Technology solutions that transform lives.”

On behalf of the institute, its internal and external stakeholders, I take this opportunity to welcome four new members of the Board of Directors being, Professor Rejoice Tshoko, Ms. Gaone Susan Macholo, Mr. Geoffrey Mahlaka, and Ms. Mpho Mogasha. BITRI will especially benefit from these members individual expertise, with each bringing on board different skillsets ranging from research and development management, human capital development, corporate governance, as well as accounting and fiduciary management. I wish to also express gratitude towards the immediate past Board members Mr. George Moloi and Mr. Baitshapi Tebogo (May Their Souls Rest in Peace), Mr. Kagiso Balopi and Ms. Lesego Thamae for rendering their services on matters of governance, strategic direction, and accountability.

As an entity, we suffered some losses in the demise of the above-mentioned Board members (Mr. G. Moloi and Mr. B. Tebogo) and two of our young and upcoming members of staff (Ms. Prisca Dube and Mr. Kemo Gabosianelwe). It is in this regard that we wish to once again

express condolences to their families.

In this quarter, BITRI continued with various initiatives aimed at engaging stakeholders on the institute's progress and direction in employing applied research and development to find solutions that transform people's lives. Under our climate change focus, BITRI in collaboration with the University of Botswana (UB) and the British Council in Gaborone hosted the Pre-COP26 Global Youth Letter Botswana Chapter and other related events in the lead up to the 26th UN Climate Change Conference (COP26) that was held in Glasgow, UK from the 31st of October to the 12th of November 2021. The details are shared on page 08 - 09.

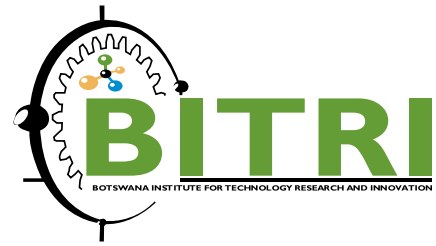
Additionally, BITRI under the Botswana pavilion, participated and showcased some of ready for market products at the 2020 Dubai Expo. It is our desire to penetrate the domestic market with our inventions, as well as to enter and compete in foreign markets, and that vision will be realisable if we keep the customer at the heart of everything we do.



In conclusion, I wish to inform you that the institute will close its offices on Wednesday 22nd December 2021 and re-open for business on Monday 10th January 2022. On behalf of the BITRI Board of Directors, Management and staff, I thank you for your support in 2021, and I assure you of our commitment to our mandate in 2022, and beyond.

Prof. Shedden Masupe
PhD, SMIEEE, Pr.Eng
Chief Executive Officer

BITRI New Board Members Appointments -December 2021



Professor Rejoice Tsheko

Prof. Rejoice Tsheko is an Associate Professor of Agricultural & Biosystems Engineering and former Acting Deputy Vice Chancellor (Academic Affairs & Research) and Head of Department (2001-2007) at the Botswana University of Agriculture & Natural Resources.

With numerous scientific publications in internationally recognised journals, and over twenty-six (26) years in the university system, Prof. Tsheko is a seasoned lecturer, researcher and consultant. Prof. Tsheko has also carried out numerous local and international consultancies in the Agricultural and Water Sectors, and Remote Sensing.

Prof. Tsheko's vast experience in corporate governance includes serving in the Board of Botswana Telecommunications Corporation Limited (BTCL) and Editorial Board Member of the WaterSA journal, a publication of Water Research Commission (WRC) in South Africa.

Prof. Tsheko holds a Doctor of Philosophy from the University of Newcastle Upon Tyne and a Bachelor of Science in Agricultural Engineering from McGill University in Canada. He is also a graduate of University of Stellenbosch Senior Management Development Programme (SM DP) and The Africa Directors Programme (ADP).



Ms. Gaone Susan Macholo

Ms. Gaone Susan Macholo is an experienced leader in the Human Capital field and has held executive positions in large corporations spanning various sectors and industries. During her illustrious career, Ms. Macholo held senior leadership positions in Debswana Diamond Co. (Pty) Ltd, BCL Mine Ltd and First National Bank of Botswana. While at FNB, she steered the achievement of 'Employer of Choice' status through exceptional employee engagement levels exceeding 75% comparative to Fortune 500 companies. She also developed the FNB transformation strategy that would ensure that FNB is well prepared for the Fourth Industrial Revolution (4IR).

Ms. Macholo is currently the Chairperson of G4S Botswana Ltd and a Member of the Botswana Telecommunications Corporation Limited Board. She is also a certified Leadership Coach and Trainer.

Ms. Macholo holds a Bachelor of Arts in Economics and Demography from the University of Botswana and a Master's degree in Public Health from the University of Massachusetts, USA. She has also attended the Executive Leadership Development Course from the Graduate School of Business at the University of Cape Town.



Ms. Mpho Mogasha

Ms. Mpho Mogasha is currently the Head of Finance & Administration at the Botswana Stock Exchange Limited. Ms. Mogasha graduated with a BA in Accounting from the University of Botswana. She is ACCA qualified and a member of the Botswana Institute of Chartered Accountants (BICA). She has completed both the Management Development Programme (MDP) and Executive Development Program (EDP) at University of Stellenbosch Business School (RSA). Ms. Mogasha also holds a Post Graduate Certificate in Enterprise Risk Management from the Botswana Accountancy College.

Ms. Mogasha has previously served as the Chairperson of the Board of Directors of Botswana Gender Based Violence Prevention Centre (BGBVPC), a non-governmental organisation that provides shelter to victims of gender-based violence. Prior to being appointed the Board Chairperson of the shelter, she had served as the Chairperson of the Audit Committee of the shelter.



Mr. Geoffrey Mahlaka

Mr. Geoffrey Mahlaka is currently the Corporate Secretary of Minerals Development Company Botswana (Pty) Ltd (MDCB), a position he has held since 2016. Mr. Mahlaka has over 17 years of experience obtained in various sectors ranging from banking, medical aids, pension fund, parastatals and mining and mining investment.

Mr. Mahlaka is a qualified Attorney and a Fellow member of the International Academy of Business & Financial Management and the Insurance Institute of South Africa. He is certified in Risk Management, Compliance, Anti-Money Laundering Prevention, Compliance Management, Corporate and Board Governance, Internal Audit Processes, Contract Management and Short-Term Insurance. He is an independent Trustee of Pula Medical Aid Fund.

Mr. Mahlaka holds a Bachelor of Laws from the University of Botswana and an Executive MBA from the Botswana Open University.



e-MOBILITY PROGRAMME

An Update on the Botswana e-Mobility Programme

“Accelerating Inclusive
Economic Growth
through Innovation
in a Sustainable
e-Mobility
Ecosystem”

The Botswana Electric Mobility (e-mobility) Programme was launched in 2021 with a primary purpose of accelerating the Botswana’s readiness to transit from fuel-based transport to environmentally friendly transportation through electric mobility solutions.

Botswana Institute for Technology Research and Innovation (BITRI) has been mandated with the research and development of the pertinent e-mobility solutions, in collaboration with key strategic partners namely Business Botswana (BB), University of Botswana (UB), Botswana International University of Science and Technology (BIUST) and Technical and Vocational Education and Training institutions (TVETs).

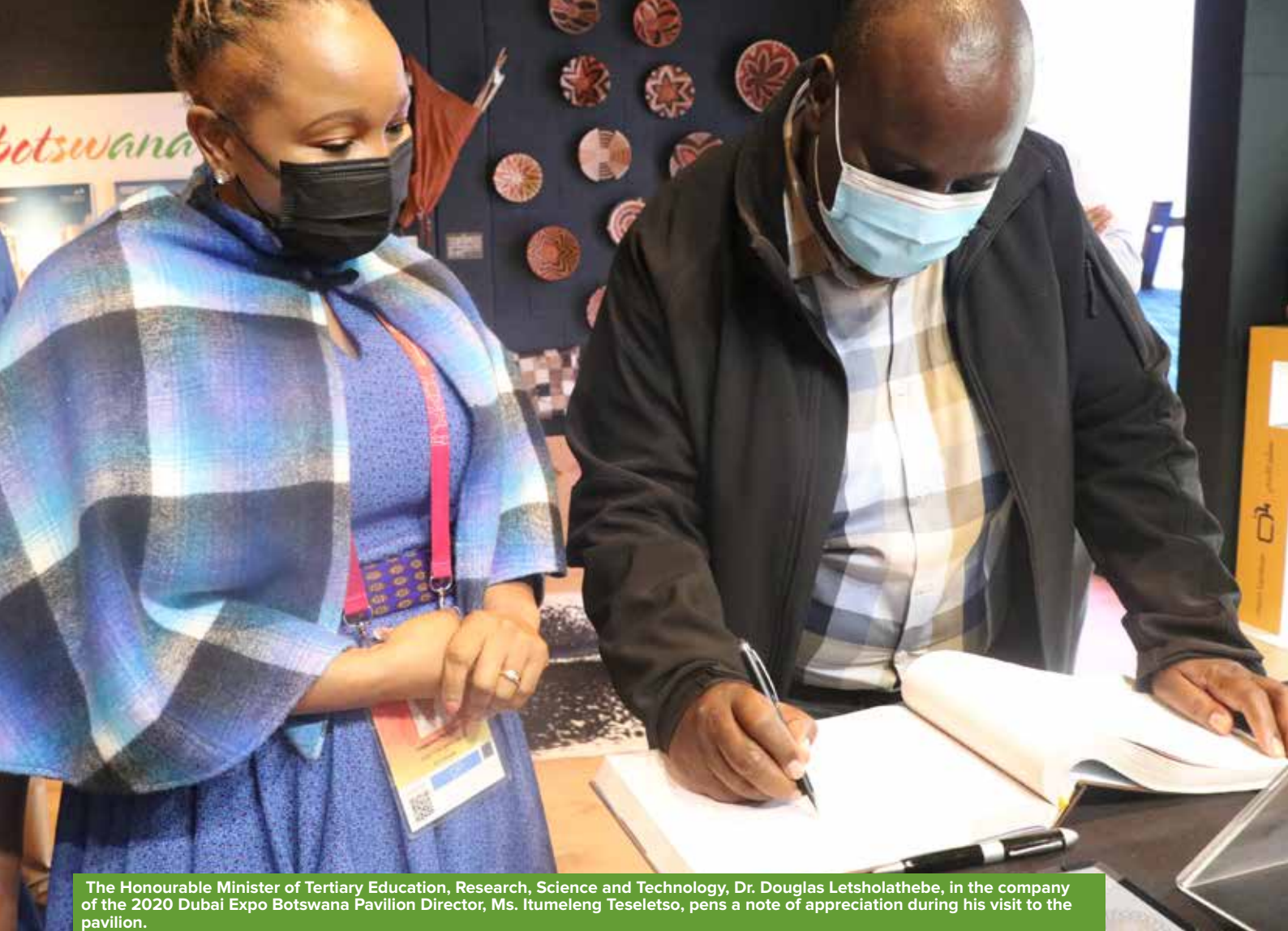
Progress To Date

Currently on the aspect of **Capacity Building**, six (6) graduate technicians have been on industrial attachment at Aliboats from July 2021. These attaches are principally learning how to build an e-boat, which has a 3-month estimated completion time.

Additionally, e-mobility Course module preparations aimed at upskilling and retooling technicians and engineers on e-Mobility were concluded in October 2021, and subsequently students have since mid-November 2021 enrolled for a 3-month Electric Vehicle (EV) & Electric Boat (EB) short courses at The Francistown College of Technical and Vocational Education and Training (FCTVET).

The training of trainers with Lecturers from BCET, FCTVE and UB was conducted in November 2021, which included the disassembly and assembly of the EV.





The Honourable Minister of Tertiary Education, Research, Science and Technology, Dr. Douglas Letsholathebe, in the company of the 2020 Dubai Expo Botswana Pavilion Director, Ms. Itumeleng Teseletso, pens a note of appreciation during his visit to the pavilion.

BITRI Participates in the **Dubai** **Expo 2020**

BITRI participated in the Dubai Expo 2020 which runs from 30th September 2021 to 31st March 2022. The Expo 2020 is being held under the theme “Connecting Minds, Creating the Future”, and 192 countries are in attendance, each with its own country pavilion to showcase its offerings and prospects in technology, innovation, architecture, learning, arts, culture, music, food, entertainment and more.





BITRI's Nakale Kelapile explaining to the Charge d'Affaires Embassy of the Republic of Botswana, Kuwait, Mr. Amangwe O. Madisakwana. The Botswana Investment and Trade Centre (BITC) Executive Director Business Intelligence Ms. Botho Bayendi looks on.

Through an invitation by Botswana Investment Trade Centre (BITC), BITRI exhibited some of its innovations, including Fleetell®, the KSBB Technology, Seding® LED solar light, as well as the BITRI-PRO Nickel extraction scale up project which is a project aimed at development of a sustainable and economic technology to produce battery grade salts from various feedstocks.

Additionally, the institution actively marketed other ready-to-market solutions, as well as promoting possible areas of commercialisation through the applicable pathways. Two BITRI teams travelled and represented the organisation between the 1st and 15th of November and the other from the 22nd of November until the 1st of December. The BITRI Chief Executive Officer, Professor Shedden Masupe led a second delegation to the 2020 Dubai Expo. The delegation left Botswana on 20th November 2021 and returned 1st December 2021. The CEO engaged scheduled business-

to-business (B-2-B) meetings with specific prospective partners as were identified by the advance delegation and through the facilitation of the Botswana Investment and Trade Centre (BITC). The CEO was accompanied by Manager – Communications and Partnerships, Ms. Lesego Moribame, Business Development Officer, Mr. Matlhogonolo Ronnie Mosweu, and Senior Engineer, Building Material Science, Mr. Mothusi Mokgwa.

BITRI teams were on the ground in November as the month was billed as Innovation month. The overall objective of the objective of Botswana's participation is to showcase Botswana's innovations, projects, and products to the global market; secure investment and export opportunities for Botswana products and services; growing the national brand; facilitating for strategic partnerships; as well as for promoting Botswana as a destination for start-ups.

The 2020 Dubai Expo is the first World Expo to take place in the Middle East, Africa and South Asia (MEASA) region. In this pandemic riddled world, the theme **'Connecting Minds and Creating the Future'** is expected to inspire people through the sub-themes of sustainability, mobility, and opportunity. Each month during the six months will have a different theme, with November dedicated as the Innovation month.

The 2020 Dubai Expo 's three subthemes of Opportunity, Mobility and Sustainability inspire visitors to preserve and protect the planet, explore new frontiers and build a better future for everyone and an opportunity to unlock the potential for individuals and communities to shape the future.

TECHNOLOGY SOLUTIONS

FROM YOU
TO US
FOR YOU

COP26

Glasgow 2021



BITRI Co-hosts the **Pre-COP26** **Global Youth** **Letter Botswana** **Chapter**

The BITRI Climate Change Division in collaboration with the University of Botswana (UB) and the British Council in Gaborone, joined efforts to build momentum and engage the citizenry on climate change issues, prior to the 26th UN Climate Change Conference (COP26), which was subsequently hosted by the UK in Glasgow from the 31st of October to the 12th of November 2021, under the theme 'Together For Our Planet'. The initiative yielded themes and messages on climate change, from various stakeholders, including youth of Botswana. The campaign entailed a series of events that included, hosting of virtual, face-to-face, blended wrap-around and amplification events around climate change challenges in Botswana as a build-up towards COP26.

TECHNOLOGY SOLUTIONS

FROM YOU
TO US
FOR YOU



change. The online webinar that was held on the 21st of October aimed at energising the key messages, activities, and ambitions of Botswana in relation to the impending COP26 was held. Various stakeholders were engaged to share their perception of climate change (opportunities and challenges) as they relate to their everyday priorities.

Dr. Bathsheba Mbongwe, the Director Research and Partnerships moderated the webinar with panellists that included Mr Nicolas Jankowski, the Head of Political Section and Climate Change at the British Council who gave an overview information on what COP26 is and what to expect at the negotiations. Mr Jankowski also covered the UK Objectives in relation to COP26 and promoted the recently launched British Council project called 'The Global Youth Letter (GYL) -Botswana chapter'. Ms Tracy Sonny, the national coordinator of the Botswana Climate Change Network, talked on the position of SADC at the COP26 negotiations, and scaled down to Botswana, touching on the country's sustainable path in relation to combating climate change challenges.

Mr Seloilwe Seloilwe, representing Business Botswana talked to the challenges and opportunities posed by climate change to the private sector in Botswana. Lastly, Dr Reason Machete (then Acting Climate Change Lead Researcher) covered aspects of the role of research and academia in climate change policy. A resounding voice among all speakers was the need for increased collaboration among various stakeholders as well as echoing the need for increased finance mobilisation as well as capacity building in issues relating to climate change.

The main idea of the series of events was to raise the voice of youth in climate discussions in Botswana. Running from the 19th of October to the 4th of November 2021, activities included a Pre-launch Event that was aired on Botswana Television's Breakfast Show on Monday 18th October 2021.

On the show, Professor Nnyaladzi Batisani, the Lead Researcher Climate Change was joined by the British High Commission's Country Director, Ms Nobantu Kalake to introduce the week's events as well as share on the overview of Botswana's status in relation to climate change related issues. On the 20th of

October, the British High Commissioner, Her Excellency Sian Price officially launched the series of events with Professor Julius R. Athlhopeng, giving an overview of climate change challenges in Botswana and current initiatives to align climate change issues with national priorities in driving the sustainable development agenda.

The launch was followed by a primary school quiz competition that engaged students from 16 primary schools spread around the country, particularly those in remote areas. The quiz was meant to provide grassroots level involvement and capacity building on issues of climate



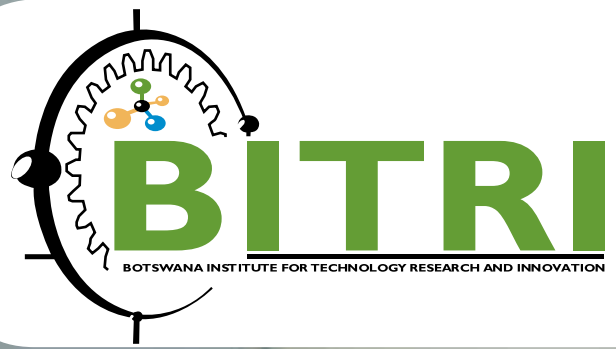
BITRI, MOTE, AMRS Host **Webinar and Panel Discussion on 9th November 2021**

Botswana Institute for Technology Research and Innovation (BITRI) in collaboration with the Ministry of Tertiary Education, Research, Science and Technology (MOTE) and the African Materials Research Society hosted a webinar and panel discussion on the theme “Towards Sustainable Energy for African Development”.

The event was held on Tuesday 9th November 2021. The main speaker was the 2019 Nobel Prize in Chemistry winner, Prof. Michael Stanley Whittingham, who spoke on the topic “Lithium Batteries: From a Dream to Enabling a Clean Fossil-Free World.” The crux of the presentation was to delve on plotting a future in which the world would have weaned itself of the use of fossil fuels, and instead fulfilling its energy requirements from renewable resources.

The subsequent presentation entitled “Towards high-efficiency perovskite solar cells” was delivered by the South African Research Chair (SARCHI) in Clean and Green Energy, Prof Mmantsae Diale. The work focused on the fundamentals behind the optoelectronic properties of perovskite materials, as well as the important approaches to fabricating high-efficiency perovskite solar cells.

The third presentation entitled “Enabling energy-dense lithium metal batteries with novel electrolyte design” was delivered by Prof Chibueze Amanchukwu. His focus was on investigating how to arrive at longer lasting lithium metal batteries that revolutionise electrified transport. Additionally, his work attempts to lower the barrier for Africans to participate in energy-related research and contribute to solving climate change related challenges.



The BITRI Building Materials Science Testing Laboratory

The BITRI Building Materials Science Testing Laboratory offers a wide range of materials testing such as tensile strength testing for steel, durability testing and compressive strength testing for all masonry units, as well as aggregate testing. Testing is not limited to the above-stated, testing can be tailored to meet the client's needs.

The laboratory serves the construction industry, property developers, research and development institutes, academic institutes, as well as the public within the local and regional markets.

Benefits

- Enables for assurance of quality of building materials used, for both developer and client
- Test results are credible
- Provides global equivalence
- Testing carried out by competent personnel
- Comparability in measurements

* The laboratory is accredited by the Southern African Development Community Accreditation Service (SADCAS) in accordance with ISO/IEC 17025:2017 for Tensile Strength Testing (Steel) and Compressive Strength Testing (Concrete) under Mechanical and Civil Engineering Testing, respectively.

For enquiries email
communications@bitri.co.bw

TECHNOLOGY SOLUTIONS

FROM YOU
TO US
FOR YOU

BITRI Participates in the **2nd Commonwealth Chemistry Posters Virtual Event**



BITRI Researcher - Nanomaterials, Dr Bellah Oreeditse Pule

The virtual poster event brought together chemists from across the Commonwealth working on similar and complimentary challenges to tackle Sustainable Development Goals (SDGs).



BITRI participated in the '2nd Commonwealth Chemistry Posters virtual event themed **Building Networks to Address the Goals**' from the 30th of September to the 1st of October 2021. BITRI Researcher, Dr Bellah Oreeditse Pule presented a poster titled '**Dual-use Chemical: From an awareness and safety perspective**' which won a prize in the Health and Wellbeing category.

With the advent of the global health and economic crisis caused by the SARS-CoV-2 outbreak it is imperative to be always prepared for the next global threat regardless of the cause, be it by pollutants, chemical toxins or biohazards. The virtual poster event brought together chemists from across the Commonwealth working on similar and complimentary challenges to tackle Sustainable Development Goals (SDGs).

In addressing one of the objectives of sustainable development, 'Improving people's health, ending poverty, and protecting the planet' Dr Pule's poster brought to light an awareness on how some substances can be used for both beneficial and harmful purposes, hence the term 'dual-use chemical'. There is a plethora of chemicals commonly used in laboratories and industries for various activities that include agricultural, research, medical, pharmaceutical, and protective purposes. Some of these chemicals have proven to have detrimental

effects if not handled properly and knowing how they could be misused is the first awareness step towards a safer use of Chemistry. Dual-use chemicals are regulated as precursors and chemical weapons (CWs) because they have a history of being used as such. As part of post-participating in the Organization for the Prohibition of Chemical Weapons (OPCW) online version of the Associate Programme and Women in Chemistry Symposium it was an honour for Dr Pule to engage in knowledge-sharing and awareness-raising on the chemical safety and security management through the Commonwealth poster presentation.

"The event gave me the opportunity to engage with other top chemists, to find potential collaborations and to network with my peers. I have received many complimentary comments and positive feedback on the quality of the poster. The knowledge, enthusiasm, and passion with which the presentations were delivered, and the friendly and open way in which everyone engaged and networked over the course of the event created a conducive environment for creativity. I hope I will be able to continue conversations that started at the event" said Dr Pule.

FROM YOU
TO US
FOR YOU

BITRI Staff Appointments



Ms. Obonetse Judith Motlhabi

BEng (Civil Engineering)
Associate Researcher
Building Material Science Division

Ms. Oboneilwe Judith Motlhabi has joined BITRI as an Associate Researcher, under the Building Material Science division. Ms. Motlhabi holds a BEng (Civil Engineering) from the University of Botswana.

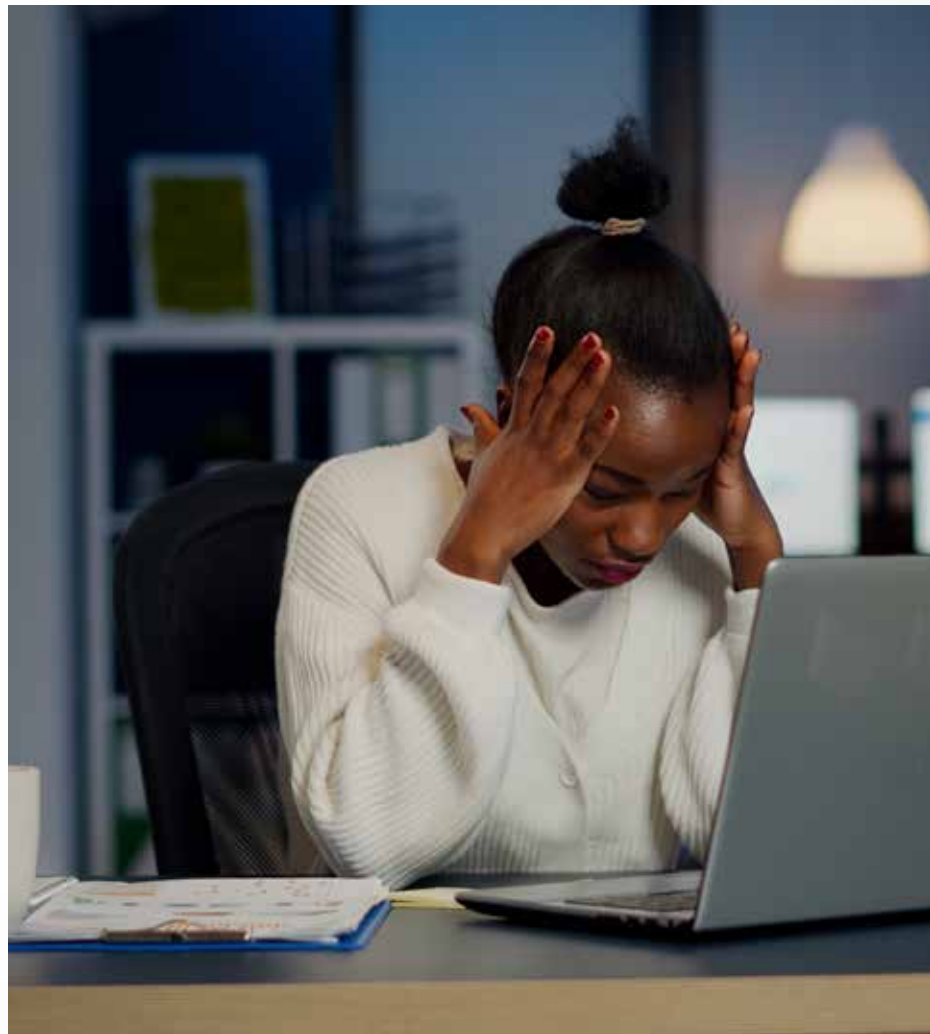
In her current role, Ms. Motlhabi's key responsibility is to contribute to the research and development project processes within scientific discipline through by use of natural resources and industrial byproducts/wastes in the development of innovative construction materials.

Prior to joining BITRI, Ms. Motlhabi worked for NMA Consulting & DNK and Associates as a Junior Civil Engineer. Her responsibilities included design and construction supervision of road infrastructure, water reticulation and sanitation projects. She previously served as a Teaching Assistant (Structural Engineering) and Laboratory Demonstrator (Civil Engineering Department) at the University of Botswana.

Ms. Motlhabi's research areas of interest are, pavement geotechnics, problem soils, highway design, sustainable materials, as well as characterization of construction engineering materials.

Coping with end of year fatigue

With the end of every year, comes the excitement of having made significant strides in achieving personal and or professional goals, as well of the impending festive season and the prospect of congregating with loved ones.



For some, the period comes with the pressure of trying to complete assignments for the year that is coming to an end, feelings of inadequacy due to not meeting achievement expectations, and fighting constant fatigue. The stress hormone, cortisol, causes an elevation of your heart rate and blood pressure, and if this phenomenon goes unchecked over an extended period, it has the potential to cause insomnia, irritability, poor concentration, weight gain, anxiety, or depression.



The past two years have had the baggage of COVID-19 in all its variants, and in some instances causing closure of even century-old businesses, loss of employment, periods of ill health, and in some unfortunate instances, loss of lives.

Some experts have shared some useful tips on how to cope with this feeling of constant tiredness which manifest due to physical, mental or a combination of both.

Following, are the three tips as shared by Matt Hunckler, Founder and CEO of Verge:

Tip 1
Scrap the new year's resolution and reflect on the year 2021 with future journaling.

This technique is different from setting new year's resolutions in that it causes one to reflect on the results of fulfilling one's intention. For this year, you could start journaling, say on 31st December 2021.

In journaling, you would reflect on what your achievements in 2021 on both the personal and professional fronts. You also reflected what you are grateful for, and how you feel about your accomplishments.

Tip 2
Put away your digital devices (mobile phone, laptop etc.) for a few days

Research has demonstrated the benefits of this practice on relationships, sleep and health. Though it may seem to apply to when one goes on holiday away from their busy life, it also works if it incorporated into our daily lives. For instance, if you go phone-free during your lunch break or when you are going for a walk in the park, you tend to take in more through your senses, including having meaningful interactions with other people and noticing interesting features in the environment around you.

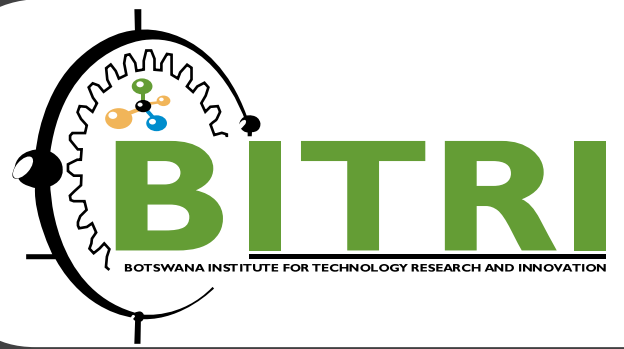
Tip 3
Prime your mindset for a successful year by reworking your gratitude practice.

On the basis that practising gratitude has proven to have a positive correlation with happiness, writing down the things you are grateful for, especially around your goals (whether that goal is improving work-life balance, fitness, saving etc.) can have a positive impact. Another important habit to develop is to look into the future with enthusiasm.

This piece is a summary of the original articles titled '**3 Simple Ways to Recover from End-of-Year Fatigue and Energize for the New Year**' and '**Go easy on yourself, end of the year fatigue may be the reason**' as they appear on the **Inc** and **IOL** websites, respectively. For detailed versions, click on the links that follow:

<https://www.inc.com/matt-hunckler/3-simple-ways-to-recover-from-end-of-year-fatigue-energize-for-new-year.html>

<https://www.iol.co.za/lifestyle/health/mind/go-easy-on-yourself-end-of-the-year-fatigue-may-be-the-reason-bd1d456a-cbf3-4580-8ccc-6b349bfe27d4>.



The BITRI Design Division

The BITRI Design Division steers the institute's user-centric technology-based research and development to enable delivery of products and services that impact on people's lives, locally and outside the borders of Botswana.

The BITRI Design Division services enable clients to deliver customisable, cost effective, efficient, and innovative solutions to customers and end users.

Services Provided by the BITRI Design Division

- Product design and development
- Additive Manufacturing prototyping (3D Printing)
- Design advisory services

For enquiries email
communications@bitri.co.bw