

September 2021 | www.bitri.co.bw ISSUE 17

BITRI

NEWSLETTER

HOTTER AND DRIER

What the Future Holds
For Botswana's Climate

**Prof Masupe Hosts
BIUST DVC RD&I
for Introductory
Discussions**

**BITRI Awarded
Grant to Produce
COVID-19 Genome
Sequencing Advert**

TECHNOLOGY SOLUTIONS

FROM YOU
TO US
FOR YOU

TABLE OF CONTENTS

CEO's Foreword	03
Minister Letsholathebe Launches Science, Technology, and Innovation Month	04
Prof Masupe Hosts BIUST DVC RD&I for Introductory Discussions	06
The BITRI Biotechnology Team Contributes Towards the Publication of a Detailed Analysis of SARS-CoV-2 on Science Journal	08
BITRI Awarded Grant to Produce COVID-19 Genome Sequencing Advert	10
Hotter And Drier – What the Future Holds For Botswana's Climate	12
Understanding Phishing E-mails	13
Coping with Virtual Meeting 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

We are almost at the end of the year 2021, and during much of our existence in the past eighteen months, we have consolidated on practices we had been taking for granted such as the regular washing of hands and disinfecting of surfaces. There has been some perceptible reprieve from the COVID-19 pandemic, and we hope that with the adjusted behaviours and practices, we will be able to keep the pestilence at bay.

This past quarter, BITRI joined the rest of the nation in commemorating the STI Month, and the Honourable Minister of Tertiary Education, Research, Science and Technology (MOTE), Dr Douglas Letsholathebe did the honours of officially launching the virtual commemorations. Organised under the theme "Fuelling Socio-Economic Transformation through STEM Awareness and Innovation" various Science, Technology, Engineering and Mathematics (STEM) activities were held nationwide to create awareness and share insights on the advances and current initiatives geared towards growing the said fields in Botswana.

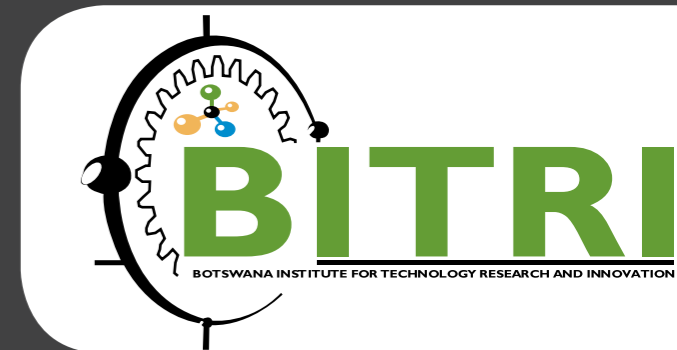
BITRI also took part by amongst other initiatives fielding of two of young female Scientists, Oratile Semong and Ms. Karabo Moswetsi in a live Facebook discussion. The BITRI Technology Transfer Officer Mr. Kesupemang Pitlagano also enlightened the youth how they could exploit different forms of Intellectual Property rights during an interview on Duma FM.

Other articles you will get to enjoy in this issue include, BITRI's Climate Change division research findings which projected a hotter and drier Botswana. In the same vein, the BITRI Biotechnology team under the Nanomaterials divisions was part of a collective of 112 African and 25 international organisations who worked in close collaboration with the Africa Centres for Disease Control and Prevention (Africa CDC) and the World Health Organisation (WHO) to publish a paper in the prestigious Science journal. The paper provides a detail analysis of SARS-CoV-2 variants and lineages in Africa and aims to enhance the continent's capacity to produce and analyse genomic data.

On behalf of the BITRI team, Board of Directors, and stakeholders, I wish to thank you for your support throughout the year, and we invite you to be our partner in developing technology solutions that will transform lives.



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



Minister Letsholathebe Launches Science, Technology, and Innovation Month

In his official address, Honourable Letsholathebe said “The overall goal of raising awareness on Science, Technology and Innovation is enshrined in the Botswana National Research, Science, Technology and Innovation (RSTI) Policy approved by Parliament in 2012. The Policy emphasises the need to popularise STEM and Innovation across society and establish initiatives to demystify and build public confidence in understanding science as well as encourage participation.”



The 2021 virtual commemorations have been organised under the theme “Fuelling Socio-Economic Transformation through STEM Awareness and Innovation”.

The RSTI Policy was conceived and adopted by the Government of Botswana upon the realisation that research, development, and innovation (RDI) were critical in creating and sustaining the country’s competitive advantage through economic growth, job creation and improving the quality of life of citizens and residents. Honourable Letsholathebe further underlined the relevance of STI by citing its application in addressing global challenges caused by the current COVID-19 pandemic, adding that the field is at the forefront of developing relevant solutions to help the world overcome the pandemic and its impact on other facets of human race’s socio-economic wellbeing. In addition, the Minister praised the efforts by developed and other developing countries in the G7, G22, and BRICS in their advances in COVID-19 vaccine development and related technologies, and on the same breath implored Botswana to follow suit.

The Minister encouraged researchers and innovators to commercialising their research outputs and shared that MOTE had dedicated 15 million pula during the current financial year to finance research and innovation projects in several research institutions.

The Honourable Minister of Tertiary Education, Research, Science and Technology (MOTE), Dr Douglas Letsholathebe officially launched the Month of Science, Technology, and Innovation on 3rd August. The 2021 virtual commemorations have been organised under the theme “Fuelling Socio-Economic Transformation through STEM Awareness and Innovation”. In line with the theme, the month will be characterised by various activities held nationwide around the fields of Science, Technology, Engineering and Mathematics (STEM), innovation and Research and Development (R&D), with an end to create awareness and share insights on the advances and current initiatives geared towards growing the said fields in Botswana. This year sees one of the staple activities of the STI Month, being the National Science Week being jointly celebrated with the Science, Technology, Engineering and Mathematics (STEM) Festival.

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

Prof Masupe Hosts BIUST DVC RD&I for Introductory Discussions

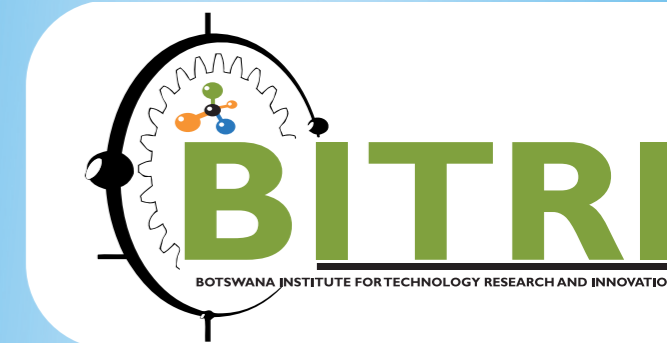
The Botswana Institute for Technology Research and Innovation (BITRI) Chief Executive Officer, Professor Shedden Masupe this week hosted the newly appointed Botswana International University of Science and Technology (BIUST) Deputy Vice Chancellor Research and Development & Innovation Professor Abraham Atta Ogwu for a meeting to discuss areas of collaborations. Subsequent to the discussions, Prof Masupe and Director Research and Partnerships, Dr Bathsheba Mbongwe led Prof Ogwu on an appreciation tour of the BITRI Centre for Material Science.



Botswana International University of Science and Technology (BIUST) Deputy Vice Chancellor Research and Development & Innovation Professor Abraham Atta Ogwu



BITRI Electron Microscopy Scientist Mr. Stephanus Coetzee (left) addressing Prof Ogwu (red tie) and BITRI CEO, Prof Masupe (right).



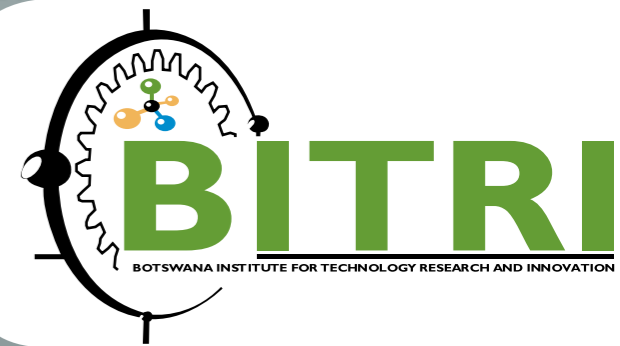
Fleetell® - Fleet Management System

Fleetell®, a fleet management system developed by BITRI, supports the day-to-day management of organizational fleet, with the aim to reduce and minimize overall costs related to fleet mismanagement/misuse and optimize fleet management process efficiencies. This allows for data analytics to be used in daily decision making of organization while effectively managing their fleet.

Features and Benefits include:

- Vehicle Inventory Management
- Vehicle Requests and Allocation Workflow
- Live Vehicle Tracking
- Key Usage Parameters Capture
- Alerting
- Reporting

For enquiries email
communications@bitri.co.bw



The BITRI Biotechnology Team Contributes Towards the Publication of a Detailed Analysis of SARS-CoV-2 on Science Journal

The Biotechnology team under the Nanomaterials division at BITRI is part of a collective of Scientists and public health officials from thirty-three (33) African countries and two (2) overseas territories that has published a COVID-19 paper in the prestigious Science journal. The paper provides a detail analysis of SARS-CoV-2 variants and lineages in Africa.

The collective comprised 112 African and 25 international organisations who worked in close collaboration with the Africa Centres for Disease Control and Prevention (Africa CDC) and the World Health Organisation (WHO) on the project. The project aims to enhance the continent's capacity to produce and analyse genomic data. At a global scale, genomic surveillance has been crucial in identifying SARS-CoV-2 variants and guiding the global public health response.

During the project, the African scientists identified many of the variants of concern (VOCs) and variants of interest (VOIs) that are being transmitted across the world and provided detailed characterisation of the variants and their impact on vaccine-induced immunity. The paper highlights the need for Africa to keep up the pace to pre-empt production of vaccine-escape variants, and a situation in which the continent becomes a breeding ground for new COVID variants.

For more details, you may access the article on the link that follows: [A year of genomic surveillance reveals how the SARS-CoV-2 pandemic unfolded in Africa \(science.org\)](#).

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

BITRI Awarded Grant to Produce COVID-19 Genome Sequencing Advert



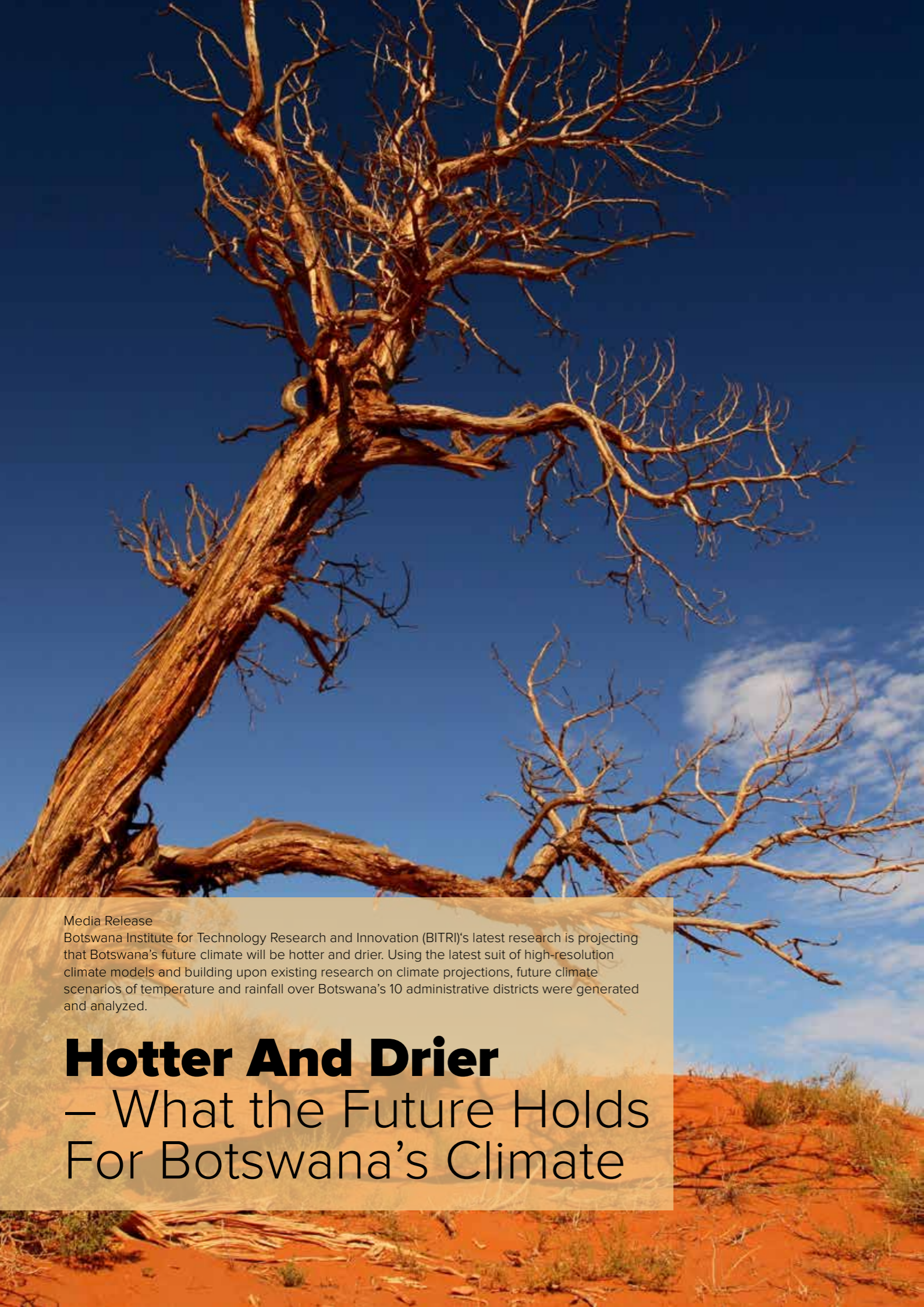
Earlier this year, the team was awarded GBP1, 500 to produce a 60-second video on the work the organization has done regarding capacity building in whole genome sequencing using the MinION through the National Institute for Health Research Global Health Research Unit Tackling Infections to Benefit Africa (TIBA) funded project.

The production, funded by the National Institute for Health Research (NIHR) through the Foreign, Commonwealth & Development Office (FCDO) aims to use the news of global success of the COVID-19 virus genome sequencing, and the incredible innovation and science behind this achievement to highlight the remarkable UK-Africa R&D research and partnership stories that exist across the Africa network. The video will tell a human-interest story featuring a young Motswana and African youth, Mr. Kefentse Tumedi and the work he has done, including his role in research of the specific genome sequencing projects, as well as capacity building in the same field.

Follow BITRI on Facebook, LinkedIn and Twitter for updates on the launch of the advert, which will also be published on the same platforms in the near future.

The Botswana Institute for Technology Research and Innovation (BITRI) Communications unit and the Biotechnology team is coordinating the video production of an advert that is meant to highlight the work that the latter team has done around COVID-19 genome sequencing.





Media Release

Botswana Institute for Technology Research and Innovation (BITRI)'s latest research is projecting that Botswana's future climate will be hotter and drier. Using the latest suite of high-resolution climate models and building upon existing research on climate projections, future climate scenarios of temperature and rainfall over Botswana's 10 administrative districts were generated and analyzed.

Hotter And Drier – What the Future Holds For Botswana's Climate



Potential increased stress in these sectors require government and relevant stakeholder to formulate or revise existing policies to help Botswana better adapt to the future impacts.

The climate projections show a decrease in annual total rainfall is projected over the entire country, mainly driven by a decrease in the September to November (spring season) months and March to May (autumn) months, while the summer (December – February) months are projected to have a slight increase. These results point towards a shift to late onset and early cessation of the rainy season with potential increased intensity during the summer months.

The drying is pronounced mostly over the eastern half of the country, with the Kgatleng district leading. Of note are decreases when the climate reaches the 1.5 and 2.0°C warming Paris Agreement temperature targets, where the North-East, Kgatleng and Central districts are projected to realize more than 4% and 5% decrease in annual rainfall at the two warming levels respectively.

Temperature-wise, Botswana, being mostly semi-arid, will warm faster than the global average. Maximum temperatures are found to increase at a faster rate than mean and minimum temperatures, especially during the September to November months. At district level, the Kgalagadi and Gantsi districts are projected to warm faster than the national

average, while the Central and North-East districts are projected to warm at a slightly lower rate than the national average. The unequal rate of warming starts to become pronounced when the global climate reaches the 1.5°C warming level above preindustrial levels.

A key finding of the study shows that care needs to be taken when defining future climate. The conventional method that defines future climate by selected time periods, gives the impression that projected change will be much greater than when using the method prescribed in the 2015 Paris Agreement which can lead to costly maladaptation efforts. These findings have significant policy implications, especially when looking at

rainfall dependent sectors of the economy such as agriculture and water. Potential increased stress in these sectors require government and relevant stakeholder to formulate or revise existing policies to help Botswana better adapt to the future impacts. These include efforts to increase adoption of climate smart agricultural practices and addressing potential future water security challenges as cross sectorial to avoid hurting other sectors of the economy among others.

For more information, contact:

Tiro Nkemelang
Cell: +267 72 955 171
Email: tnkemelang@bitri.co.bw

Understanding Phishing E-mails

Cyber security threats are one of the biggest challenges facing organizations today. According to the Washington Post, it is estimated that about \$1 trillion was lost to cybercrime globally in 2020. This is of particular concern because cybercrime is continually trending up and shows no signs of slowing down any time soon. Besides financial loss for organizations and individuals, cyber breaches may also result in the following consequences:

- Loss of sensitive data such as personal sensitive information and company secrets etc.
- Operational downtime caused by disruption to systems as result of a cyber breach.
- Reputational damage which may result in loss of customers.

Over 90% of cyber-attacks can be initiated by email through a process called phishing. This is an email designed to trick people into revealing their personal information such as passwords or credit card details. It may also be used to bait people into clicking on web links which may deploy malicious software.

Closer to home, reports indicate that operation at South Africa's National Railway company, Transnet came to a grinding halt in July 2021 because of a ransomware attack.

This goes to show that the hackers are sophisticated, relentless and there is no small or big target for them. All companies are potential targets regardless of industry, size or employee number. In fact, they have stepped up their efforts as more companies have adopted the remote work mandate.

The COVID-19 outbreak has led to a significant rise in phishing email scams. This is because employees are a prime target for cyber-criminals to gain access to corporate networks. This only holds true if employee security awareness is at its lowest.

Therefore, it's important that we note that cybersecurity is everyone's responsibility. Employees are urged to adhere to simple

online safety best practices, at home or work, to avoid our organization becoming the next cyber-attack victim.

Following, are some safety best practice guidelines:

Passwords

Employees are encouraged to have strong passwords. Avoid using the same password across multiple accounts and desist clicking on the tempting "remember password" checkbox.

Antivirus software

As many of us are working from home, our antiviruses are hardly updated when automated patches are run at work. Antivirus provides the first line of defence by blocking and detecting malware. Ensure your antivirus is fully updated.

Email

Email attachments and web links within email are major source of malware. Do not download attachments or click of weblink from an unknown sender. Be alert for suspicious email especially those that create a sense of urgency. Report suspicious email to your IT department.

Internet Activity

Do not visit untrustworthy websites such as those offering illegal movie or song downloads or any other illegal software. Those sites are infested with malwares.

Coping with Virtual Meeting Fatigue

After over a year of remote work, a considerable population of people who have had to shift from holding customary meetings and gatherings have expressed virtual meetings fatigue. This phenomenon is based on the fact that the number of meetings has increased by approximately 90% in comparison to pre-pandemic levels.

But, what exactly makes virtual meeting more exhausting in comparison to physical meetings? Respondents (and research) have cited unnatural lack of nonverbal cues, cognitive overload (due to trying to read cues), limited mobility (due to being in one position for long), prolonged eye contact, as well as overload of faces (including our own) to process on the screen as the major causes of fatigue.

Research done has reported attendees feeling more fatigued after virtual meetings more than is normally the case with in-person meetings due to, at times contradictory reasons. Some respondents seem to appreciate the detached format of virtual meetings, while some find it alienating. Other people miss the social aspect of in-person meetings, while others do not appreciate the small talk that a manager would try to infuse into virtual meetings.

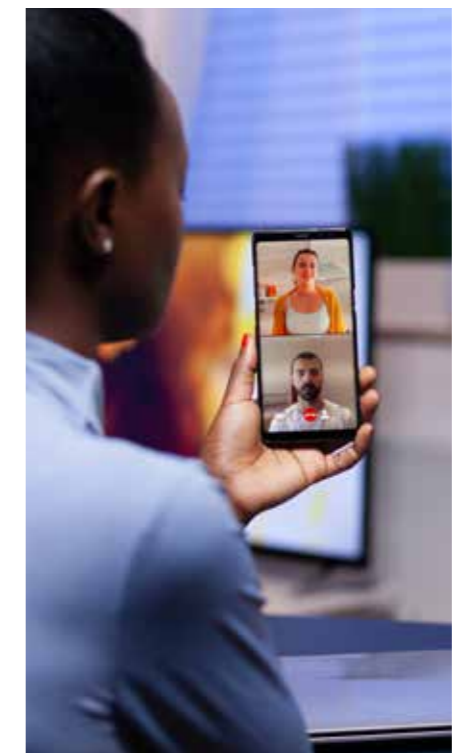
With virtual meetings and remote working arrangements tipped to be permanent fixtures of the nature of work, leaders and managers have a responsibility to tailor their meetings based on the feedback from their teams to enhance their effectiveness. The crux of the dialogue would be to identify what works and what does not in relation to specific teams. Some potential questions that a manager can pose to his/her team, include but are not limited to:



- How helpful are our team meetings?
- What is working well and not so well? What should we do differently?
- To optimize your workflow, should our meetings be scheduled in the morning, midday, or afternoon?
- How long should our meetings be?
- How often should we meet?
- Would you benefit from days or time blocks with no meetings?
- If you were to lead the meeting, what would you do differently?
- Cancel unnecessary meetings and make necessary meetings shorter.
- Assign different roles to attendees when it makes sense, such as facilitator, notetaker, or timekeeper.
- Use breakout rooms for problem-solving, discussions, and social interactions.
- Hold asynchronous meetings, such as by creating a shared Google document for employees to contribute to throughout the day.
- Build in breaks during long meetings and in between back-to-back meetings. Encourage employees to get up, stretch, and walk around.
- Implement meeting-free time blocks or days.
- Moderate and facilitate virtual meetings more actively, moving topics along when needed and ensuring that everyone has an opportunity to contribute.
- Turn off "self-view," if possible, on your meeting platform and make camera use optional for some meetings.

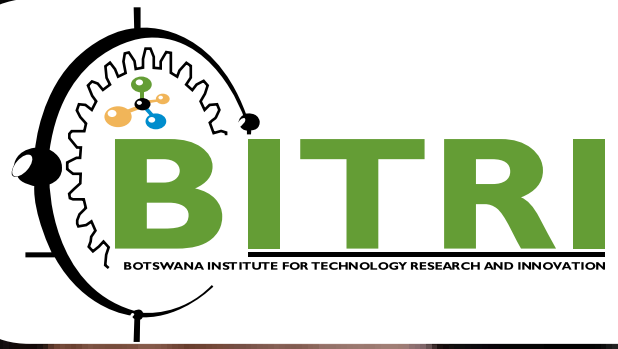
From thence, managers should work to cater and balance the preferences of different demographics within their teams.

In addition to the initiative detailed above, the general that follow guidelines can help to make virtual meetings more effective and less fatiguing:



Managers are encouraged to adapt these guidelines, and experiment with different meeting strategies or platforms, and strive for effectiveness over imposition of formats that do not work.

****This article is a contraction of the original version titled "How to Combat Virtual Meeting Fatigue" as published by MIT Sloan Management Review available at <https://sloanreview.mit.edu/article/how-to-combat-virtual-meeting-fatigue/>**



The ICTAssociates @BITRI Programme

The ICTAssociates @BITRI is a competency-based two-year programme intended to develop young Batswana ICT-graduates in planning, starting, and operating sustainable businesses in the ICT sector.

Currently, the programme has produced three operational and sustainable businesses developed by ICTAssociates, namely **Nthusa**, **Mmualebe**, and **SignCoach**.

MMUALEBE

CUSTOMER FEEDBACK | SURVEYS



signcoach

NTHUSA

EMERGENCY MANAGEMENT RESPONSE SYSTEM

For enquiries email

communications@bitri.co.bw