



NEWSLETTER

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BITRI Stakeholder Engagements

NOV

BITRI Media Brief

Maranyane House, Gaborone, Botswana

NOV

BITRI Public Seminar

Gaborone, Botswana

1st

DEC

World AIDS Day

Botswana

5-6

DEC

South Africa Science Forum

CSIR, Pretoria, RSA

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CEO's Foreword

Botswana Institute for Technology Research and Innovation (BITRI) joins the rest of the world in celebrating the 53rd Botswana Independence anniversary. We collectively celebrate the immense achievement our country has attained in terms of infrastructure development, human capital, services, key economic indicators and the general improvement of quality of life enjoyed by the citizenry and residents of our beautiful Botswana.

BITRI was established to conduct needs-based technology research that provides sustainable innovative solutions through co-creation and collaboration as clearly stated in the BITRI philosophy; **"Technology Solutions from You, to Us, For You"**. Our existence is based on our ability and dedication to working with other stakeholders and end users of technological solutions we produce, for the benefit of those involved.

This edition, highlights some of the technological solutions we have delivered through co-creation and collaboration: the Kalahari Sand Building / Blocks/ Bricks Technology that is affordable, sustainable and environmentally-friendly; the Climate Smart Agriculture Lessons Learnt manual developed in collaboration with the Ministry of Agricultural Development and Food Security, the United Nations Development Programme (UNDP) Botswana, agriculture extension officers and farmers to help the latter mitigate the effects of climate change and enhance food security for communities and the country; the Biodigester and the Energy Efficient Stove with a focus on producing affordable green energy for all sectors; and the Solar Thermal Testing Facility (STTF) that performs outdoor technical tests, research and innovations in all solar thermal systems and components to ensure compliance to international standards. These are a handful of the projects BITRI and its partners, have delivered, with some at the final stages of refinement, in collaboration with the end users, and with the end user in mind.

The Fourth Industrial Revolution (4IR) represents disruptive forces that with the challenges they bring, also present tremendous opportunities, and the recent 4IR Workshop, the public seminar entitled "Building and Leveraging your Innovation Ecosystem" as was addressed by Dr. Sibongile Gumbi, as well as the Science, Technology and Innovation Month underscored this fact. I was afforded an honour to make a presentation on the topic **'Rapid Technologies Change –**

Are We There Yet?' at the 4IR Workshop. Within the 4IR technologies such Additive Manufacturing, Advanced Robotics, New Materials, Internet of Things (IoT), Blockchain, Artificial Intelligence (AI), Genome, and Synthetic Biology, Botswana has achieved various levels of implementation and readiness to exploit the said opportunities. BITRI is in a position to offer leadership, and foster collaboration with all stakeholders to develop capacity, infrastructure, stimulus and incentives to achieve full realization of 4IR. With good intent, and a willingness to put our thoughts into practice, we can all realise the promise of the much-touted knowledge-based economy, for the betterment of all.

We invite you the engage with this edition and are looking forward to engaging you in developing your ideas and concepts into fully-commercialised products. Enjoy the holidays and let's work towards achieving **'Prosperity For All'** as per the dictates of Vision 2036.

Re a leboga. PULA!

Prof. Shedden Masupe
BITRI Chief Executive Officer



BITRI Public Seminar Enthuses

The Botswana Institute for Technology Research and Innovation (BITRI) public seminar held on 4th July 2019 titled “Building and Leveraging your Innovation Ecosystem” focused on how academia and Research and Development institutions can leverage upon the innovation ecosystem within which they operate for effective and smooth technology transfer for the benefit of all stakeholders. The guest speaker, Dr. Sibongile Gumbi addressed an enthusiastic audience on her journey as innovator and black woman entrepreneur and contextualised BITRI as Botswana’s premier research institute, concluding with how the organization could leverage its capabilities to enhance the country’s key economic sectors, including mining, agriculture and tourism.



Dr. Sibongile Gumbi addressing the audience on the topic “Building and Leveraging your Innovation Ecosystem” during a recent BITRI Public Seminar.

When delivering the Welcome Remarks, BITRI Board Member Mrs Lesego Thamae said BITRI’s measure of success as the Government’s principal research institute was translating research results into practical solutions that have a positive impact on the country’s economy.

“BITRI was established to contribute to the socio- economic needs and global competitiveness of Botswana. In addition to its vision of being “The leading technology solutions provider that transforms lives”, BITRI has adopted a robust philosophy that defines how it goes about executing its mandate for the betterment of Batswana. The philosophy is - “Technology Solutions from You to Us for You. Ladies and gentlemen, at the core of this philosophy are the underlying operative words - co-creation and collaboration. BITRI as a research technology organization operates in innovation eco-system where every party is equally important and must diligently and effectively play its role through co creation and collaboration. BITRI exists to conduct demand-driven research and development,” elaborated Mrs. Thamae.

Mrs. Thamae encouraged stakeholders to work with BITRI in the development of innovative solutions. “I would like to request and encourage, members of the public, Small Medium Enterprises, local companies, organizations and the academia and the industry to collaborate and co-create with BITRI to provide relevant and useful technology solutions to problems they are confronted with. BITRI has a well-established Department of Research and Partnerships.

In setting the tone for her talk, Dr. Gumbi gave an overview of her journey as an entrepreneur and the challenges that she and her partners faced as owners and drivers of innovation at iVacBio (Pty) Ltd which she owns and manages with other black women. Dr. Gumbi also gave an overview of technology innovation worldwide, highlighting how technology is constantly advancing, touching on every industry, helping to develop scalable and high growth potential businesses and impacting every aspect of life, principally to make it easier, and better. Dr. Gumbi further contextualised BITRI as a research institute, touching on its research areas and the relevant support functions and strategic objectives, which include “... fostering and supporting high-quality applied research and facilitating the commercialization of research output into relevant and applicable innovations.

Dr. Gumbi stressed the need for an evolving policy landscape, utilization of new technological opportunities, intensification of knowledge-based growth, and creation of high growth companies. “The level of technology and advancement of the system of innovation is also an important determinant of economic growth. A rapid rate of growth can be achieved through high level of technology. If the level of technology development becomes constant the process of growth stops. Thus, it is the technological progress which keeps the economy moving,” Dr. Gumbi explained.

The approach involves Fostering an Innovation Ecosystem with Government establishing and implementing high-level policies to foster innovation, having the business sector as the main driver of innovation, with other actors such as financiers and academic and research institutes developing financial products, skills and outputs, in that order that support the strategic objectives of the Government. Measures for such an approach would include providing incentives for investing in Research, Development and Innovation (RDI), providing venture capital and mentorships for

start-ups, and making it easier to all levels of business sizes to register and commercialise Intellectual Property and the related innovations.

"The Fourth Industrial Revolution is a new era that builds and extends the impact of digitisation in new and unanticipated ways. It represents entirely new ways in which technology becomes embedded within societies and even our human bodies. It is characterised by the integration of technologies that is blurring the lines between the physical, digital and biological spheres and its development and diffusion is faster than ever. The growing harmonisation and integration of different disciplines and discoveries presents BITRI with opportunities, to amongst others, mix computational design, additive manufacturing, materials engineering and synthetic biology to pioneer new interactive systems, for example in 3D printing of living tissue and implantable devices. There is also an opportunity to restore and regenerate our natural environment through the application of technologies and intelligent systems design," Dr. Gumbi expounded.

For application of the 4IR, Dr Gumbi recommended solutions such digital twinning for training employees on potential risks in the workplace, the use of autonomous vehicles and equipment and the application of intelligent data analytics systems and fitting mining equipment with sensors that generate messages about breakdowns or safety issues for optimisation of capital and labour and enabling better decision-making. For the tourism sector, Dr. Gumbi recommended digitisation of products, big data and cloud computing for easier understanding and satisfaction of individual customer needs accurately, as well as the use of robots to offer services such as greeting, transfer, bell-boy services, payment, promotion, on-site guidance, food and beverage orders.

For agriculture, recommended applications include the use of smart devices, greater automation for better energy efficiency, optimising food technology, especially food design and preservation and specific applications in the bioscience arena, which encompasses protein production and animal genetics. The recommendations also covered to use of tools to enhance sustainability such as vertical agriculture, the use of internet by livestock farmers to access information and knowledge to improve productivity on their farms, utilization of mobile devices and platforms connect smallholder farmers to markets as well as geo-spatial analysis to help farmers make informed decisions.

In his Closing Remarks, the Managing Director of Botswana Vaccine Institute, Dr. George Matlho acknowledged the orientation of the Botswana Government to establish RDI at the core of its development agenda and called for greater collaboration research development institutions and business to come up with more relevant and groundbreaking innovations.

The seminar was patronized by the BITRI Board of Directors, leaders from different organisations and sectors, the media and BITRI management and staff. The BITRI public seminars are held on a quarterly-basis and are intended to share and exchange research ideas on topics of current relevance to our mandate in contributing to Botswana's socio-economic development.



The audience during Dr. Gumbi's presentation.

BITRI and Partners Launch CSA Manual

BITRI, in partnership with the Ministry of Agricultural Development and Food Security and the United Nations Development Programme (UNDP) Botswana yesterday launched the Climate Smart Agriculture Lessons Learnt manual. The manual was developed with the objectives to influence national approach to programming CSA interventions that transcend any specific technology, introduce, promote and popularize CSA approaches and interventions and well as to create awareness, among the stakeholders, on the impact of Climate Change and vulnerability of agriculture and food security.

The project, which culminated in the launch of the CSA manual, was borne out of BITRI's intention to augment Ministry of Agricultural Development and Food Security efforts to increase local food production and improve food security. The funding for the project was provided by the Global Environment Facility/ Small Grants Programme implemented by the UNDP, covering 45 smallholder farmers comprising of 29 females and 16 males from the Kgalagadi South and Barolong sub districts. In addition, 45 district agriculture managers and Extension Officers, and 500 farmers benefitted indirectly through interactions such as farm walks and field days.

The common strain amongst presentations and discussions was that climate change is a reality, and it affects various economic sectors and facets of lives, and as such, the agricultural sector has to devise means through which farmers, especially small holder farmers, whose livelihoods depended on their farming outputs, could build resilience and ability to adapt to climate change.

When delivering the Official Opening and keynote address, the United Nations Resident Representative, Her Excellency Jacinta Barrins said "I see this event as two things - first, as a celebration of the work that farmers, together with Extension officers and BITRI have put in over the last three and half years. The other element is, to create a dialogue, so that today you will all have an opportunity to ask 'Why is that today, we are talking about conservation agriculture?', otherwise known as smart agriculture. I want to acknowledge the Small Grants Programme and its coordinator, Ms Abigail Engleton, because this project is unique in its own right. It's based on this premise 'Why do we have small grants that are not more than US\$50, 000.. How can we have small grants that bring change? I have worked in about four countries where there was a grant, and each one of them had brought tremendous change. And what we are launching today, is an example of the transformation that amount of money can make."



(From Left to Right): The Ministry of Agricultural Development and Food Security CSA Coordinator, Mr. Douglas Machacha, the United Nations Resident Representative, Her Excellency Jacinta Barrins, and the BITRI Chief Executive Officer, Prof. Shedden Masupe holding the Climate Smart Agriculture Lessons Learnt Manual.



BITRI Associate Researcher Climate Change, Ms Kgomotsego Motlopi in giving the project overview at the launch of the Climate Smart Agriculture Lessons Learnt manual.

BITRI Associate Researcher Climate Change, Ms Kgomotsego Motlopi in giving the project overview acknowledged the contribution of all stakeholders.

“We [BITRI], like everybody else, is concerned about the effects of climate change. The Government of Botswana is also concerned about the same phenomenon because it affects the country’s ability to attain food security. Food security is a challenge all over Africa, and the rest of the world, so if we fail to respond to this challenge, we will not be able to produce enough food for our people. In the first year of the project, we got mixed results, with some farmers not fully-complying to the guidelines. With improved compliance, the results improved in the second year, leading to farmers not covered by the programme, expressing their interest to participate. We intentionally involved the UNDP and the Ministry of Agricultural Development and Food Security because we wanted to undertake evidence-based research that would also help us engage the said stakeholders better and for them to help us interest the farmers in the programme,” elaborated Ms. Motlopi.

The BITRI Chief Executive Officer, Prof Shedden Masupe, in the Closing Remarks, underlined the need to produce local solutions to local challenges, including developing farming technologies with the farmers.

The project identified nine key lessons as detailed in the manual, and these include viewing climate change as a development issue, considering key characteristics of the intended beneficiaries when designing interventions, viewing the farmers as innovators, considering social and cultural factors in designing programmes, factoring soil health as key to reaping the benefits of CSA, embracing farmer to farmer education to hyping interest and sustaining conversion to CSA, investment in capacitation of Extension Officers, facilitating access to seasonal weather forecasts as key to the success of CSA, as well as engaging the private sector in order to increase participation of small holder farmers.

Ms. Motlopi and Ms. Koketso Mannathoko coordinated the project and the authoring of the manual, with Prof Nyaladzi Batisani providing oversight and direction throughout the life of the project. inclusive of scientists, researchers, innovators and indigenous health practitioners in the health fraternity to develop solutions to health problems facing the country and expressed optimism regarding the full utilisation of the nuclear medicine and oncology department at the Sir Ketumile Masire Teaching Hospital.

BITRI Participates at the Global Expo

BITRI is participating at the Global Expo which started on the 6th to the 9th August at Fairgrounds in Gaborone. The theme of the expo is "Harnessing the power of emerging markets for economic growth". BITRI is participating mainly to market the CMS, Building Materials Laboratory and STTF. Officially opening the Global expo the President Dr Mokgweetsi Masisi expressed delight that the expo has grown a lot, bringing in more exhibitors including those from outside the country compared to when it started in 2006. Dr Masisi alluded to the fact that the theme resonates well with the need for industrialization "so as to unlock the potential of the country's human and financial capital, as embraced by the mid-tier emerging economies that the country aspires to do business with". He said slowly but surely emerging markets were upsetting the dominance of the more industrialised economies. He said as a country Botswana is willing to learn from the experiences of other developing economies and to develop strategic partnerships. The President said "entrepreneurship could be achieved through strategic partnerships with emerging economies which were more advanced in digitalization and application of artificial intelligence. We need to nurture the spirit of entrepreneurship in this country in order to stimulate economic growth through value addition and beneficiation of our natural resources" the President said. For her part, the Minister of Investment, Trade and Industry, Ms Bogolo Kenewendo said "we want to industrialise and leapfrog to the fourth industrial revolution, and for this we want to work with emerging markets in order to achieve desired economic transformation over the next 10 years". The President and his delegation toured the stalls amongst which there was an exhibition by Batswana entrepreneurs under the "#PUSHABW" slogan. Apart from the exhibitions the expo also had presentation on various themes, hackathon and business matchmaking sessions.



Bakang Modukanele attending to customers at the BITRI stall during the 2019 Global Expo.



BITRI Technology Transfer Officer - Business Development, Ronnie M. Mosweu explaining the Technology Transfer and Commercialisation process to a customer.



BITRI Electron Microscopy Scientist, Stephanus Coetzee informing clients about the services provided at the Centre for Material Science.

BITRI Exhibits at 2019 Ghanzi Show

BITRI exhibited at the Ghanzi Show that was held from 22nd to 28th July. The Building Materials Science division showcased the KSBB Technology, given that Ghanzi and its hinterland are not only Kalahari sand territory, but also home to a cluster of four (4) KSBB depots, with two currently under construction and close to completion, and the other two scheduled for subsequent site mobilization.

A wall stub constructed to demonstrate use of the KSBB, showcase its aesthetic appeal and sturdiness as a building material. The Energy division also took advantage of this event to promote technologies that are applicable to farming enterprises in the form of the Biodigester and the Energy Efficient Stove. Prospective customers got a chance to witness demonstrations on the energy efficient stove, which is under development. The stove uses considerably less biomass and utilises super heat to heat the bottom of the pot, drastically reducing cooking time and contributing towards use of firewood and related biomass.

The official opening of the event was conducted by the President of the Republic of Namibia, His Excellency Dr. Hage G Geingob, who attended the event by invitation of the President of Republic of Botswana, His Excellency Dr Mokgweetsi Eric Masisi based on the fact that Botswana and Namibia's shared interest in the pastoral farming subsector and due to Ghanzi region's proximity to the cattle-rearing area in Namibia. President Masisi and the H. E. Geingob led a delegation that made a stop at the BITRI stall during the tour of stalls. The delegation were briefed on some of the products relevant to farmers, including the energy efficient stove due to its capacity to preserve the environment as it uses less biomass; as well as the Climate Smart Agriculture manual that provides a guide to small scale arable farmers on how to use climate change smart technologies to increase productivity and resilience against adverse climate conditions.

The event, organized by the Ghanzi Show Trust, provides a suitable forum for farmers, parastatals, government agencies, companies, and small traders to showcase services and goods and communicate the value of their offerings to the market. The show also featured activities such as livestock shows, crop shows, horse race, dog race and gala dinner. On top of being a platform for stakeholder education and marketing, the event also provides leisure opportunities and attracts interest from travelers from the local market, South Africa and Namibia.

BITRI was represented by Resident Engineer, Mangaliso Dennison, Communications Officer, Frank Rakgomo, Associate Researcher - Building Materials Science, Gaolatlhe Swereki, Technology Transfer Officer, Kesupemang Pitlagano, and Assistant Product Designer, Humphrey Matlapeng.



The President of Republic of Botswana, His Excellency Dr. Mokgweetsi Eric Masisi, accompanied by President of the Republic of Namibia, His Excellency Dr. Hage G Geingob, leading a VIP delegation that made a stop at the BITRI stall during the tour of stalls. Pictured, is Assistant Product Designer, Humphrey Matlapeng briefing the demonstrating the energy efficient stove.



BITRI Associate Researcher - Building Materials Science, Gaolatlhe Swereki explaining the KSBB Technology to customers.

HOW THE STTF CAN

With a major transition to solar thermal systems for hot water heating in the residential, commercial and industrial processes, the Energy Division team of BITRI of the many projects they are doing, has set up a global standard Solar Thermal Testing Facility (STTF) at its premises in Gaborone, Botswana: The main objective of setting up this facility is to perform all outdoor technical tests, research and innovations in all solar thermal systems and components for the solar thermal industry, governmental organs and members of the public strictly following international standards testing procedures and protocols for quality assurance and consistence purposes.

The STTF promotes research and development on the thermal collectors and systems and this could pioneer innovative research outcomes that local and regional manufacturing industries develop around as well as ensure that sub standards components do not infiltrate our market.



The facility serves regulatory bodies, research institutes, companies in the construction sector, central and local government agencies, as well as individual customers.

ADD VALUE TO YOUR LIFE

In general, the Research and Development of Solar Thermal Systems focuses on, but is not limited to:

Thermal collectors:

- a. Highly efficient roof integrated thermal collectors and systems with and without stagnation protection mechanism
- b. Glazed Photovoltaic-Thermal (PVT) collector with improved thermal performance and high reliability and life time durability
- c. Conventional Flat Plate Collectors and evacuated tube collectors

Thermal storage:

- a. Cost-effective water storage with increased efficiency, improved insulation and simplified design with further improved poly-generation based systems, that is both electric heat stores, solar thermal heat stores and combined heat stores.

The STTF also does conduct outdoor tests on Solar Thermal Collectors and systems in compliance with international standards. The tests concerned, include:

1. Thermal performance
2. Incidence angle modifier
3. Time constant / Heat capacity
4. Pressure drop Test
5. Quality and Reliability Test covering the following: -
 - o Rain Penetration Test
 - o Internal Pressure Test
 - o Internal and External Thermal Shock Test
 - o Mechanical Load Test
 - o Impact Resistance Test
 - o Exposure and Half Exposure Test



The laboratory is capable of doing **Thermal Performance Test of four (4) systems** simultaneously according to ISO 9459-2 and Part 5 of the standard.

Currently, tests are ongoing for clients commercial testing of their thermal collector component and simultaneously doing the Inter-Laboratory Comparison with other external solar thermal testing laboratory in Switzerland, Germany and Austria. The purpose of Inter-Laboratory Tests is to confirm competence level of the laboratory before Accreditation with SADC Accreditation Services (SADCAS) on ISO 17025.

Furthermore, the laboratory is open to the industry, general public, other research organizations and university for further investigation on issues pertaining to Solar Thermal Technology research and development.

Botswana Prepares for 4IR

The Gaborone International Conference Centre played host to the national forum on fourth industrial revolution (4IR) in August, a platform whose main purpose was to take stock of the Botswana's readiness for implementation and exploitation of 4IR. The objectives of the forum were to provide a platform for public and private sector responsible for STI and stakeholders to appreciate the local, regional and global perspective of the 4IR, determine the country's progress in achieving the aspirations of Vision 2036 in the selected priority areas and its readiness for 4IR, with an emphasis on building convergence by breaking down the sectorial silos, as well as to set a development agenda for the 4IR Strategy for Botswana in the context of Vision 2036 and NDP II.

In the Official Opening Remarks, the Minister of Tertiary Education, Research, Science and Technology, Mr Thapelo Olopeng said Botswana should review its readiness for the 4IR and move towards actionable tasks and targets in order to ensure that it derives benefits as per Vision 2036 and NDP II aspirations, key amongst them being transformation of Botswana from an upper middle-income country to a high income country by 2036. Minister Olopeng added that emerging opportunities and challenges of the fourth industrial revolution needed to be considered and evaluated with appreciation of the local, regional and global perspectives. In the context of the launching of the Science, Technology and Innovation (STI) Month, as August has been bestowed that status, Mr Olopeng said the theme for 2019, "Embracing Rapid Technology for Sustainable Development" contributed to efforts to familiarise Botswana with various technologies and their benefits to them and the rest of the world.

"These rapid technologies collectively constitute the fourth industrial revolution and are disruptive because they bring about drastic economic, political, industrial and societal changes," said Mr Olopeng, when making reference to how 4IR disruptive technologies and trends such as the Internet of Things (IoT), robotics, virtual reality (VR) and artificial intelligence (AI) are changing the way we live and work. The Minister also implored on Government Ministries, departments and the business sector to integrate responses towards the 4IR, especially since STI, through the African Union's Agenda 2063 has been earmarked as a key enabler in promoting the ability of African countries to achieve their socio-economic goals as well as inclusive and sustainable economic growth hinged on



The BITRI Chief Executive Officer, Prof Shedden Masupe presenting on the topic of 'Rapid Technologies Change – Are We There Yet'.



Director – Department of Research, Science, and Technology and BITRI Board Member Mrs Lesego Thamae responding to a question. Looking on, is MOTE Permanent Secretary, Dr. Theophilus Mooko.

Pan-Africanism and African Renaissance ideals.

When delivering Remarks of Appreciation, The Vice Chancellor of Botswana International University of Science and Technology (BIUST), Prof Otlogetswe Totolo also noted that the fourth industrial revolution would be the greatest disruptor of our time. He said the digitisation of things would significantly affect all facets of life including job creation, productivity, markets and the global economy. He said it called for the country to ready itself to face the challenges that come with the revolution. Professor Totolo also emphasised the need for the country to come up with diversification strategies to reduce over reliance on minerals.

He said significant infrastructure development needed to take place in the country in order to carry economic activities that could transform the country. He noted that it was a tradeoff that had happened throughout past industrial revolutions in developed countries.

The BITRI Chief Executive Officer, Prof Shedden Masupe presented on the topic of 'Rapid Technologies Change - Are We There Yet?'. When giving an overview of 4IR, Prof Masupe said the phenomenon consists of three Megatrends, namely Physical, which encompasses the use of Autonomous Vehicles, Additive Manufacturing, Advanced Robotics and New Materials which are lighter, stronger and recyclable; the Digital sphere which encompasses the Internet of Things (IoT), Blockchain and Artificial Intelligence (AI); as well as the Biological sphere, which encompasses, Genome, Synthetic Biology and Data that enable an increase in medicine precision with targeted therapies. Prof Masupe's presentation further delineated selective Sustainable Development Goals as set by the United Nations General Assembly as pertaining to Botswana and he juxtaposed them against the opportunities under 4IR as well as the levels of implementation and readiness to exploit the said opportunities. Although the presentation showed different levels of readiness, and evidence of exploitation by different stakeholders such as entrepreneurs, Government, farmers and RDI institutions such as BITRI, the overall level of readiness is low, calling for a heightened need to develop capacity, infrastructure, stimulus and incentives to achieve full realization of 4IR.

The outputs of the forum were to gauge the understanding of the 4IR, as well as to develop a Botswana National Navigation Route that delineates actionable tasks and targets on harnessing the 4IR, and the tool to be implemented in the next 12 months, with a goal of bringing impact on the key sectors of Health, Education, Agriculture and Finance. The tool is intended to address issues such as the requisite legislative framework/s, as well as resources in the form of infrastructure, human and financial resources. .



A group picture of MOTE, BITRI, BAS and other key stakeholders who coordinated and organised the workshop.



Part of the audience during the 4IR Workshop listening to one of the presentations. The Workshop attracted participants from Government agencies, academia, research institutes and the private sector who engaged in deliberations on how Botswana can leverage on opportunities presented by 4IR.

STI Month Theme Calls for

BITRI joined other state-owned enterprises, academic institutions, techpreneurs, primary and secondary school pupils in participating and exhibiting in the 4th National Science Week held from 19 to 23 August. The commemorations, which were part of the Science, Technology and Innovation Month, were held in Goodhope in the Southern District, and was part of a series of events planned across the country to raise awareness, stimulate interest in Science, Technology and Innovation and to provide a platform for showcasing research and innovation products with a view of exposing commercialisation potential to entrepreneurs.

The event was officially opened by the Assistant Minister in the Ministry of Tertiary Education, Research, Science and Technology, Honourable Moiseraele Goya. In his keynote address, Minister Goya said Botswana continues to make inroads in science, technology and innovation, citing fields such as Satellite Communication and Navigation, Space Engineering, Earth Observation, Planetary Science,

Astronomy, Astrophysics and Cyber Infrastructure. The Minister also buttressed the need to create similar platforms and other mechanism in order to attract pupils and youth to STEM-related vocations, with the end goal of achieving critical mass in the required technical skills and expertise, and the creation of viable industry to support sustainable socio-economic growth and enhancing the competitive advantage of Botswana. Minister Goya enthused the 4IR has potentials to cut costs for businesses and improve the quality of lives for members of society and implored on stakeholders to harness these potential benefits.

"Bagaetsho, this year's theme 'Embracing Rapid Technologies for Sustainable Development', and the mandate of the Ministry of Tertiary Education, Research, Science and Technology, being to transform the country from resource-based to knowledge-based economy, require new policies and strategies that are aligned to current trends and emerging developmental issues. As we take advantage of the Fourth Industrial Revolution, and the digital transformation, the potential



The Assistant Minister in the Ministry of Tertiary Education, Research, Science and Technology, Honourable Moiseraele Goya.

Adoption of Rapid Technologies

benefits and risks for this new era, are a subject of ongoing discussions, and Botswana is not going to be left behind. The Fourth Industrial Revolution is the current and developing environment,” elaborated Minister Goya.

The BITRI exhibition during the week-long exposition, focused on showcasing the KSBB Technology, CSA Manual, Building Materials Testing Laboratory, Solar Thermal Testing Facilities, and Centre for Material Science, amongst other offerings of relevance to the market that is principally agrarian. In relation to the KSBB blocks and bricks, customers were educated on the product and its benefits such strength, environment-friendliness in both processes of both production and application, aesthetic appeal and durability. BITRI has constructed a KSBB plant in Phitsane Molopo, and with this education, it is hoped that people in the concerned catchment area, which includes Goodhope, would develop a favourable view of the product and use it in construction of the commercial and residential properties. BITRI is also promoted the Climate Smart Agriculture Lessons Learnt manual, which was developed in collaboration with selected farmers in the Borolong area. The project was done in partnership with the Ministry of Agricultural Development and Food Security and the United Nations Development Programme (UNDP) Botswana, with the purpose of determining risk factors to the attainment of food security by smallholder rain-fed

arable farmers, with the end goal of developing, in conjunction with farmers, the use of climate smart technologies to increase productivity and farmers' resilience. The Building Materials Laboratory, CMS and STTF services were also promoted in the market to sensitise prospective customers on how they could utilize the services of these facilities in their scopes of operation and everyday lives.

The event also presented an opportunity to an create awareness of the application of STEM in every life, as well as careers and business opportunities to an organic traffic comprised of pupils from primary and secondary schools in Borolong, and other areas such as Palapye and Molepolole.

Earlier in month during the launch of Science, Technology and Innovation Month on 1st August the Chief Executive Officer of Botswana Institute for Technology and Research Institute (BITRI), Professor Shedden Masupe told participants that science and innovation is the future and that Botswana must move with the times. The Minister of Tertiary Education Research, Science and Technology, Thapelo Olopeng, in his Official Address, had also expressed similar sentiments and highlighted the benefits of the Fourth Industrial Revolution (4IR) as well as the challenges. Other activation activities of the STI Week were held in Francistown, Jwaneng, Orapa, Palapye, and Selibe-Phikwe.

BITRI Hosts BIUST Mechanical and Energy Engineering Students

BITRI hosted 3rd year Mechanical and Energy Engineering students from Botswana International University of Science and Technology at the Solar Thermal Testing Facility (STTF) at Maranyane House. The project Lead Investigator, Ronnie Phuthogo facilitated the tour.

The STTF serves to perform outdoor technical tests, research and innovations in solar thermal systems and components for the solar thermal industry, regulatory bodies and members of the public, in accordance to international standards testing procedures and protocols for quality assurance.

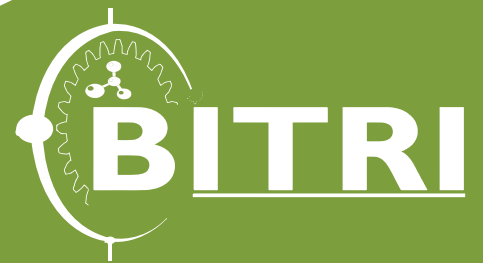
To learn more about the STTF, refer to article on page 10>



STTF Lead Investigator, Ronnie Phuthogo, giving the students an overview of the facility and its capabilities.

TECHNOLOGY SOLUTIONS

FROM **YOU**
TO ^{US}
FOR **YOU**



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