

2022 NATIONAL SCIENCE WEEK

THEME:
"STEM - Advancing
Life for Sustainable
Development"



The Monitor Feature

05 September 2022

National Science week commemorated

The Ministry of Communications Knowledge and Technology in collaboration with Botswana International University of Science and Technology and other key stakeholders held the National Science Week (NSW) at Masunga village which attracted thousands of students in the North East region.

The all week event, hosted from August 23 to 26 was geared at promoting awareness, appreciation and understanding of Science, Engineering and Technology (STEM).

This year's NSW was held under the theme: 'STEM – Advancing Life for Sustainable Development.' When giving a keynote address to celebrate the auspicious occasion, the Minister of Commu-

nications, Knowledge and Technology Thulaganyo Segokgo said that they have a mission to achieve the first priority of the reset agenda to save Botswana's population from COVID19 through research and innovation.

According to Segokgo his ministry is directly supporting this research which, when completed, will place them in a better position to tackle similar pandemics in future.

He stated that the major application of science results that they have celebrated as a country is that of discovering a new Omicron variant before the whole world knew about it.

He added: "Some on-going research that my Ministry supports is focused on using mathematics to devise strategies

for Managing COVID-19 and detection of prevalence of COVID19 in wastewaters through routine testing to inform early warning systems."

The Minister said that another related research is on developing rapid field testing kits for detecting the Foot and Mouth Disease on site so as to help in the monitoring of the disease before it impacts on the cattle population.

It is a fact that increased research and innovation activities spur the economy to greater levels of economic growth and wealth, he added.

Therefore, he elaborated that for Botswana to achieve the high-income status they have to increase the locally produced products and services that the world will need through STEM.

Botswana signs the SADC WISETO Charter

The Minister of Communications, Knowledge and Technology Thulaganyo Segokgo has signed the Southern African Development Community (SADC) women in science, engineering and technology organisation (WISETO) charter. Segokgo signed the SADC WISETO charter during the official ceremony of the National Science Week (NSW) commemoration. Earlier when addressing the attendants who graced the occasion, the minister said that research has indicated that gender inequality is partially due to unsupportive cultures that negatively impact the advancement of a woman's career.

He added: "Societal beliefs and the learning environment on girls' achievements and interest in science and mathematics have an effect in the way girls perform in mathematics and science."

He said it is so ironic that in this aspect of science and mathematics they are doing so badly in living up to "Mosadi Thari Ya Setshaba" and "Go Ruta Mosadi Ke go Ruta Setshaba. According to Segokgo there is a need to vehemently reverse, hence at regional level there is the SADC Charter on establishing WISETO. He shared that the organisation's main aim is to advocate for increased participation of women in STEM at all levels as well as enhance the future of SADC women by building their capacity through continuing education, skills development and participation in other related science, engineering, technology and innovation programmes. For his part the SADC value chain programme officer Farai Manhanga said that currently 10 member states have signed the charter.

Manhanga said that the charter would enter into force 30 days after the minister signed the charter.

According to article 23, the charter will enter into force when 2/3 of the members' states have signed the charter. So far SADC has 16 members' states including Botswana. Manhanga highlighted that implementation of the charter will be following SADC decision making system which starts with their committee of their senior officials which includes permanent secretaries and council ministers.

He further shared that as a development community their work is based on industrialization strategy road work which has three pillars thus industrialization, competitiveness and within this strategy they also have a mainstream of gender and youth issues. Manhanga added that their development is based on the development of regional value chains which are mainly agri processing, mining, pharmaceuticals, consumer goods, capital goods and services. He said that the charter aims to develop a SADC database of women in science, technology, engineering and mathematics, or STEM. He further said that the charter would as well as facilitate the establishment of fully functional networks to lobby for more women representation and participation in science, technology engineering and innovation.

On another note the Minister of Communications, Knowledge and Technology launched the National Science communication and public engagement strategy.

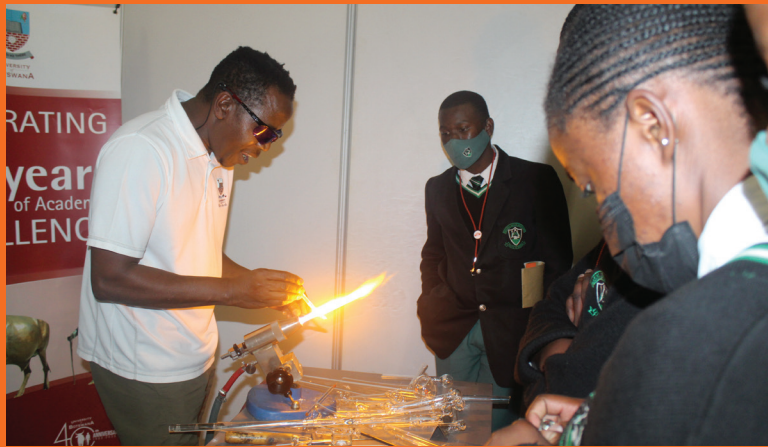


Minister Segokgo signing of the women in science, engineering and technology organisation charter

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Glass blowing demonstration

BIUST train over 30 educators on STEM open education resources

The Botswana International University of Science Technology (BIUST) trained teachers in the North East region on effective interactive student centered learning for science and Mathematics during the just ended National Science Week (NSW).

When giving a presentation on STEM open education resources (OER) for educators, BIUST Manager for Pre-University Academic Programmes Leapotswe Bantsi said that teachers need to improvise and use recycled bottles or any other materials for experiments during science lessons as part of OER.

She also said that the teachers should also be able to use demonstrations on Mathematics lessons through enquiry based learning (EBL).

She explained that EBL is when students take active roles in learning with the assistance

of their teachers.

Bantsi said that it was high time teachers used experimental learning so that students would be able to participate in STEM related subjects.

She noted that with some schools facing lack of Science and Mathematics tools, teachers should also be ready to use available materials as part of their teaching to make learning be more meaningful, fun and experimental.

She said that as Botswana pushes towards being a knowledge based economy, it is very critical that students are encouraged to think for themselves and develop research problem-solving and reasoning skills.

"It is important for them to be mindful of science process skills through asking questions, making a guess, doing experiments, record analysis and come up with a conclusion," said Bantsi.

130 students participates on makeathon and hackathon competitions

This year's National Science Week (NSW) makeathon and hackathon has attracted 130 participants from different schools in the North-east region.

Amongst the overalls participants there were 67 boys and 63 girls from both primary and secondary level.

Moreover, about 69% of the participants who were part of the makeathon competitions were from 18 primary schools.

The remaining 31% of the makeathon entrants were from North East region secondary schools including two senior schools thus Mater Spei College and Masunga Senior School.

Matshelagabedi primary school took position one on the hackathon primary category whereas Nlapkhwane and Masunga primary schools took position two and three

respectively.

Under the hackathon junior secondary schools (JSS) categories Tashatha JSS scooped first position followed by Pelaeolo JSS and Maruje JSS securing the third place.

Still on hackathon competitions Mater Spei College was on top of the class beating Masunga Senior Secondary School (SSS) to settle on the second position.

Masunga SSS was able to be cream of the cream by defeating Mater Spei College.

Prior to the makeathon and hackathon competitions the participating students took part in a seminar hosted by BIUST on practical experience of using tools to build or construct useful devices such as a microphone. On another note, Ramoja JSS won the design and technology competitions beating Maruje JSS.

BDF showcase science in Military

Botswana Defence Force (BDF) participated during the National Science Week showcasing some of the technologies they use in the military.

The BDF exhibition attracted over 1360 students who came to learn about different technologies used in the military and taught at their joint technical training school.

The military Joint technical training school deals with engineering, science and technology.

The local military also displayed of the BDF Pilatus PC 7 Aircraft flying control system.

Additionally the BDF soldiers explained the technologies that are used for flight controls, propulsion and fuel system.

There was an illustration on the PC 7 propulsion engine main components, PC 7 flight control on ailerons and elevator and PC7 fuel system on the general layout.

Furthermore, BDF displayed about weapon mechanics and ammunition department.

Other stakeholders exhibitions covered appropriate agricultural technologies, educational exhibitions, analysis of national and regional STEM

ecosystem and opportunities seminar, indigenous knowledge systems (IKS) products to mention but a few.

The stakeholders including government, parastatals and private institutions included Botswana Parliament, New Era College, Department of Mines, Government Online, Department of Telecommunication and Postal Services, Botswana Post, Macmillan Botswana, Botswana Post, Department of Information Technology (DIT), University of Botswana, Geoscience Institute, Masunga Senior School, Maruje Junior Secondary School and others.



BDF team exhibiting



BIUST launches a motor vehicle

Masunga villagers thronged the National Science Week (NSW), to come and witness the auspicious occasion in which Botswana International University of Science and Technology (BIUST) was launching their very own talented craftsman Batshani Sekoto's revamped motor vehicle.

Sekoto started a fundraising initiative to buy an engine for his vehicle by walking and pushing his unfinished self-made and non-moving vehicle around Botswana back in 2016. The 27-year-old innovator walked from Masunga to different corners of Botswana including Gaborone, Maun, Shakawe, and Nata pushing his self-made vehicle. When launching the motor vehicle BIUST Vice Chancellor Professor Otlogetswe Totolo said that the vehicle was handed to BIUST in 2020 to the Department of Mechanical, Energy &

Industrial Engineering.

He was excited about the launch of the motor vehicle, indicating that the main highlight is that they had to interact with innovators and the community at large. He said that when revamping the car they had the opportunity to interact with Sekoto. "Our intention was not to make the car differ from the original concept. All we did was to add value from what he had from engineers to a scientific point of view," added Totolo.

BIUST Vice Chancellor indicated that instead of Sekoto pushing the car Masunga to Zambia, he is now going to be driving it. For his part during the handover of the vehicle, the Minister of Education and Skills Development Dr Douglas Letsholathebe expressed gratitude to BIUST for their kind gesture and turning a young man's dream into a reality. He urged Sekoto to take good care of the motor vehicle

and to never stop dreaming and innovating. He was hopeful that Sekoto would replicate his motor vehicle and make money out of it. Dr Letsholathebe said that the innovation by Sekoto proves that Botswana youth are capable of manufacturing things locally.

Sekoto was over the moon and could not hide his happiness as he was riding and showing off his revamped motor vehicle.

The young innovator gave gratitude to BIUST, especially the department of mechanical, energy and industry engineering.

The sky is the limit for Sekoto as he is already thinking of a new project to work on.

Sekoto manufactured a helicopter back in 2003 while still doing Standard Two. After years of his innovation he was able to secure an old engine which enabled the helicopter to fly.

He encouraged the youth in the country to never stop dreaming.

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Astrotourism vital economic resource

With different astrotourism opportunities growing across the globe, the director of Diamonds in the Sky and also an astronomer William Tomlinson has called on the Masunga community to explore different technologies used for star gazing to boost their economy.

The astronomer spoke about astronomy tourism (astrotourism) after his presentation on understanding the formation of the stars which was held at Ntoba River.

According to Tomlinson, some of the countries with best night skies for stargazing have already started using different technological inventiveness for astrotourism opportunities.

He shared that already neighbouring countries like Namibia have started to integrate astrotourism as part of their tourism sector.

“Namibia is already ahead of Botswana as they already have a few camps only focused on astronomy tourism. Tourists visit the camps and pay just to gaze at the stars using a telescope,” he said.

Tomlinson further said that Botswana has perfect sky for stargazing especially along rivers, pans and desert areas.

Therefore, it was very crucial for the government to start recognising star gazing as part of the service sector.

“There is a need for both the government and private sector to also explore star gazing opportunities. We can start by training young innovators to be profes-

sional astronomers. This calls for establishments of astronomy training institutions which would create employment,” he added.

On another note when speaking about the uptake of STEM subjects in the country, Tomlinson said that he was aware that Botswana does not produce enough scientists and engineers.

He elaborated that most young people are not interested in Mathematics and Science as they deem them to be difficult and boring.

“When I came to Botswana, my objective was to teach young people about astronomy. I introduced it to the children in different schools by just giving them the experience of a telescope at night when the skies are clear,” he added.

At that juncture, he realised that the approach to get the children out of the classroom and giving them the experience of star gazing made the scientific process more fun and fascinating.

Therefore Tomlinson said that for more students to be interested in STEM related subjects they should be given the experience of different scientific processes away from the classroom setup.



Astronomer William Tomlinson interacting with Minister Segokgo



Minister Segokgo gazing at the stars



Minister of Education and Skills Development Dr Douglas Letsholathebe addressing the attendants during NSW



Keynote address by the Minister of Communications, Knowledge and Technology Thulaganyo Segokgo



BIUST Vice Chancellor Professor Otlogetswe Tololo giving highlights of planned activities for NSW



Signing of the women in science engineering and technology organisation charter

Government pleads with private sector to partake on STEM

The Minister of Basic Education and Skills Development Dr Douglas Letsholathebe has called on the private sector to contribute to Science, Technology, Engineering and Mathematics (STEM) by contributing to research and development.

According to Dr Letsholathebe research and development will propel Botswana's economic growth driven by knowledge and services.

He said that as they continue with the promotion of STEM subjects at lower levels, they hope to lay a good foundation for research and innovation at universities and

workplaces which are vital for knowledge creation. “Government continues to develop medium to long term plans for reforms in education which includes up-skilling the Teachers and improving infrastructure at primary, secondary, vocational and technical education levels, as well as provision of the necessary equipment and funding at all

levels including tertiary,” added the minister. Furthermore, he said that his ministry would continue to work with various stakeholders to ensure an increase in the uptake of education and training at various levels with a deliberate emphasis towards STEM.

Dr Letsholathebe also believed that most rural areas including North-East will be in a position to harness the 4IR in the production system.

By doing so, he explained that they would not only improve production but also be able to improve their efficiencies.

Earlier on, Dr Letsholathebe said that

they have started implementation of multiple pathways to respond to global moves as a way of improving the access, relevance and quality of education and training.

He said that they are working on provision of ICT equipment's at basic education level for teaching and learning which is part of driving towards digitization as per the reset agenda.

“Development of the e-Education Policy to facilitate increased access to programmes and services offered through e-Education and to improve quality, equity and affordability of the same across Botswana,” he added.

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Diary officer Agness Rasengwatshe presenting on dairy goats



Horticulture officer Mompoloki Chabanda addressing the villagers on hydroponics



Impala Farm manager giving an update on Care and management of new born kids and lambs Phibion Mannathoko



Principal technical officer Millan Mpofo presenting on artificial insemination

Exploring scientific technologies to increase productivity

Experts in crop and animal productions have urged farmers in Masunga village to explore diverse scientific technologies to increase their production level.

The same experts from the Department of Crops and animal productions were addressing farmers on the best scientific agricultural practices that can be used on small stock and crops.

Giving a presentation on hydroponics, Department of Crop production Horticulture officer Mompoloki Chabana has called on farmers to change their mind-sets on farming in order to yield more food.

Chabana said that there has been rapid progress and results obtained in various countries through the use of hydroponics which have proved that this technology is thoroughly practical and has very definite advantages over conventional methods of crop production.

Hydroponics is often defined as the cultivation of plants in water. It is however a technique for growing plants without using soil. He

highlighted that hydroponics can be used in places where in-ground agriculture or gardening is not possible.

Thus, he added that the technological method of crop production is not only a profitable undertaking, but one which has proved of great benefit to humanity.

Through the use of this farming method, people living in crowded city streets, without gardens, can grow fresh vegetables.

Impala farm manager Phibion Mannathoko said that the main challenge they are facing is that there is low production of goats in the country. He said that this is mostly contributed by the care and management of new born kids and lambs. He said that the key is to increase small ruminants as their growth is stagnant.

Mannathoko said that kids and lambs must receive enough colostrum during the first 18-

24 hours because if delayed it cause intestinal closure.

He said that colostrum immunology protects the lambs for up to three weeks.

In his address, acting superintendent of department of veterinary services Kangangwani Malumbela spoke about heart water which is noncontagious tick-borne disease of domestic ruminants and wildlife.

He said that they use blood vaccines and blocking to control heart water in the country.

He explained that blood vaccines are the use of immunization where they infect animals with heart water whereas he described blocking as allowing animals to get exposed to infection while covering them with tetracycline drugs.

For his part the department of veterinary services Principal Technical officer Millan Mpofo has called on the farmers to explore the use of artificial insemination.

Currently, he said that the average Cold Dress Mass (CDM) of the 90% of beef cattle

slaughtered at Botswana Meat Commission (BMC) is 250 kg per carcass while the profitable mass is set at a target of 350 kg.

The results are that most of the animals slaughtered are small in size which means lower carcass weights, he added.

Mpofo shared that another aspect is that milk production of dairy cattle is 15 liters per day per cow instead of 20 liters per day per cow. He said: "This is due to low genetically makeup of cows as well as other factors like poor management and feeding."

The demand for milk in Botswana stands at 65 million liters per year while the current production stands at 7 million liters per year.

Under normal conditions and management practices, a cow produces eight to ten calves in her lifetime, he added.

Mpofo indicated that artificial insemination has caused an increase in the utilization of bulls while embryo transfer has greatly increased the number of offspring a genetically superior cow can produce.

2022 National Science Week GALLERY



Dignitaries together with soldiers participating on the morning walk



Villagers attending the Domboshaba presentation lecture



Department of Museum officer Milton Tapela making presentations on Domboshaba ruins



Chief walkers



Science show demonstrations



Invited guest and exhibitors doing exercises after the 5km walk



Sekoto test drive his motor vehicle prototype



Thako ya Pitse hosanna group entertaining attendants

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