



THE THIRD CEMEREM SUMMER SCHOOL REPORT- 2019

Theme: Water, Mining and Agriculture

Taita Taveta University- School of Business and Social Sciences
"Water management for sustainable mining and agriculture"

1.0 Preamble

The Centre of Excellence for Mining, Environmental Engineering and Resource Management (CEMEREM) was officially inaugurated in April 2017. CEMEREM brings together Taita Taveta University (TTU), the University of Applied Sciences Dresden (HTWD), Technische Universität Bergakademie Freiberg (TU Bergakademie Freiberg) and some other Germany Institutions to research, build and share knowledge on mining and natural resource management.

Annual Summer School is one of the expected outcomes in CEMEREM phase II, Work Package seven (7)- **International Exchange and Research**. It is meant to provide Taita Taveta University students with an exposure to academic labs, excursions, industry best practices, international culture and an opportunity to share ideas and network. On 14th to 22nd July 2019 was the third CEMEREM summer school of this project whereby sixteen (16) students and four (4) lecturers participated.

2.0 Preparation for the Summer School

The participants slots for summer school were as follows: School of Agriculture, Environment and Earth Sciences (SAEES)- 2 students and 1 staff, School of Sciences and Informatics (SSI)- 3 students and 1 staff, School of Business Economics and Social Sciences- 4 students and 1 staff & School of Mining & Engineering 7 students 1 staff.

2.1 School of Business, Economics and Social Sciences (SBESS) Nominees

The participants were nominated using the CEMEREM Project Management approved criteria. The School of Business, Economics and Social Sciences nominated four (4) student and one (1) Staff as per the criteria.

The SBESS Nominees for the third Summer School were as follows:

| Reg. No. | Name | Gender | Prog/ Year of Study | Mean Score |
|---------------------------------------|---------------------------|--------|---------------------------|---------------|
| TU01-BE212-0149/2016 | Omondi Silas Ouma | M | BCOM- 3 | 73.24 |
| TU01-BE213-0410/2016 | Nafuna Sharon Wafula | F | BBIT- 3 | 71.81 |
| TU01-BE211-0308/2016 | Riogi Vincent Elija | M | BPSM 2 | 71.21 |
| TU01-BE212-0006/2017 | Funda Mwanakombo Nyamvula | F | BCOM-2 | 70.73 |
| SBESS Staff: Mwachanya Thomas Makungu | | | | |

Whereby:

- SBESS: School of Business, Economics and Social Sciences
- BCOM is Bachelor of Commerce;
- BBIT is Bachelor of Business Information Technology and
- BPSM is Bachelor of Purchasing and Supplies Management

Table 1: Third Summer School Nominees for School of Business, Economics and Social Sciences

The participants were informed in writing by Registrar – Academic, Research and Outreach by 28th March 2019 which provided sufficient time to prepare their documentation (passports and visas) required for international travelling.

2.2 Third Annual Summer School Theme:

This year’s Summer School theme was **Water, Mining and Agriculture**. Each School was to derive its sub-theme from the main one. The theme for the School of Business, Economics and Social Sciences (SBESS) was: **Water Management for Sustainable Mining and Agriculture**. SBESS participants topics were derived from the schools sub-theme.

2.3 Presentation topics:

The lecturer guided the students in preparation for the summer school on matters regarding application for passports, visa and preparing their posters for presentation. The poster preparation started with choice of topics, content and layout which was achieved through proper guiding of the School’s Academic Staff. The presentation topics for SBESS participants were as presented in the table below:

| Name | Presentation Topic |
|---------------------------|--|
| Omondi Silas Ouma | <i>Impact of Financial Planning in Water Management for Sustainable Mining and Agriculture in Kenya</i> |
| Nafuna Sharon | <i>The effects of Automated Billing for Water Management on Water Utilities in Kenya</i> |
| Riogi Vincent Elija | <i>Supply Chain Management of Water for Sustainable Agriculture in Arid and Semi-Arid Areas in Kenya</i> |
| Funda Mwanakombo Nyamvula | <i>Strategic Financial Decisions in Water Management for Sustainable Agriculture and Mining in Kenya</i> |
| Mwachanya Thomas Makungu | <i>Market Segmentation and Demarketing strategies for Effective Management of Water in Kenya</i> |

Table 2: School of Business, Economics and Social Sciences Participants Presentations Topics

2.4 Flight and Accommodation Booking

The flight reservation and booking were done by CEMEREM- Germany partners and an invitation letter sent by Prof. Ulrike Feistel in good time to allow for visa processing. The booking for accommodation was also done well in advance.

3.0 The Third Annual CEMEREM Summer School

The third annual CEMEREM summer school took place from 15th to 21st July 2019. The participant travelled to Dresden -Germany of 14th July 2019 and back to Nairobi -Kenya on 22nd July 2019.

3.1 Day One (Sunday, 14th July 2019): The Journey to Dresden Germany:

The participant gathered at Jomo Kenyatta International Airport by 0600hrs Kenyan time for airport clearance and they were all in flight to Berlin Via Amsterdam by 0805 hrs. The Team arrived in Berlin Tegel Airport at 0600 hrs Germany time. After clearance they departed in a bus that picked them for a two and half hours' drive to Dresden. The team was accommodated in a youth hostel "Rudi Arndt" Hübnerstr. 11. 01069 Dresden

3.2 Day two (Monday, 15th July 2019): HTW Dresden

The participants were picked from the hostel and walked to HTW Dresden where they were welcomed by their hosts that included- Prof. Ulrike, Prof. Bongaerts, Prof. Stenzel, Dr. Liu, Susan, Marx among others. The day started with a group photo at HTWD entrance.

After that the participants were paid their daily allowance, had lunch and in the afternoon had the following lectures and discussions:

- ✓ **Drinking water production in Dresden, Germany: Current Issues and Future Challenges by Yasmin Adomat:** Pointed out water sources for Dresden, how water is treated and monitored for contaminants. Her main focus was on the emerging water contaminants- mainly micro-plastics, its sources, effects and how it can be controlled.
- ✓ **Mining 4.0 by Prof. Bongaerts:** Focus on emerging use of technology in mining whereby there is less use of human labour, automation and robotics, internet of things, the cloud etc. Use of this technology will make mining processes faster, accurate, cost effective and safer.



Figure 1: Prof. Prof. Bongaerts presenting on Mining 4.0

- ✓ **Judging and Addressing Climate Change by Prof. Feistel and Dr.Liu:** presented the history or background information in relation to the changing climate. The presentations pointed out the impact of carbon and Oxygen content in the atmosphere; tectonic processes; orbital processes and the global climate policies. They also presented on the economics of climate change.

3.3 **Day three (Tuesday, 16th July 2019): Leipzig, LMBV (Lausitzer und Mitteldetsche Bergbau- Verwaltungsgesellschaft mbh):**

The participants paid a visit to LMBV which is a federal company in charge of land rehabilitation and cleaning of contaminated water and soils as a result of lignite mining activities in Lusatia in East Germany. The company improves water quality of opencast mining lakes, stabilizing opencast slopes, landscaping & forestation and cleaning up sites contaminated by mining activities. LMBV also promote recreational activities, tourism, industry & trade activities and human settlement in the rehabilitated areas. The participants were taken through the process of slopes stabilization, water decontamination and soil clean-up processes on site.



Figure 2: Summer school participants visiting to Leipzig, LMBV (Lausitzer und Mitteldetsche Bergbau- Verwaltungsgesellschaft mbh)

3.4 **Day four (Wednesday, 17th July 2019): HTW Dresden**

The day started with feedback on what was learnt and observed at LMBV; later there was presentations by the students and the staff from TTU. The staff presented their papers and the students

presented their posters. There was a session of discussion in relation to the papers and posters. All the presentations were in relation to this year's summer school theme- Water, Mining and Agriculture.



Figure 3: SBESS student Silas Omondi presenting his poster in HTW Dresden

In the afternoon, participants from the School of Science and Informatics, School of Mining Engineering (SME) and School of Business, Economics and Social Sciences (SBESS)- were taken through the Implication of digitizing and mobility of raw materials from developing countries: socio-economic and ecological implication for mineral producing countries. They also visited Lab HTW where they were taken through- methods of flow measuring, seepage flow model and virtual welding in VR- rooms.

3.5 Day Five (Thursday, 18th July 2019): Visit TU BAF underground mine:

The participants from SBESS, SSI and SME had an opportunity to Visit the world oldest Mining University. They also had a chance to go into underground mines in a conveyor basket and saw the underground mining tunnels, taken through the History, the tools & equipment and the safety processes used in the mines.



Figure 4: Summer school participant during their visit to TU BAF underground mine

Later in the afternoon they Visited TU BAF Labs- and had an opportunity to ride on an excavator simulator being used in mining. The participants also visited the virtual lab- ‘the cave’ where they saw simulations of the Freiberg town, the underground mines etc.

3.6 Day six (Friday, 19th July 2019): A visit to Einsiedel and Chemnitz

The participant visited Einsiedel Dam which supplies water to Chemnitz. The participants were given a brief history and the description of the dam. The participants were also taken to water treatment plant within Einsiedel and they were taken through the treatment process to the point where water is pumped out to the users.



Figure 5: Summer School participants at Einsiedel Dam

Later the participants travelled to Chemnitz where they had lunch and afterwards the participants heard a presentation from Mr. Adero on “Water, Mining and Agriculture Nexus” which mainly addressed the water situation in Kenya and Taita Taveta County.

Participants concluded the day by a visit to the Chemnitz water storage and pumping facility where they were given a brief history and informed how it works. The systems in the station are automated and well maintained.

3.7 Day seven (Saturday, 20th July 2019)- A free day

The participants had a free day where they toured Dresden, others travelled outside the town to explore, shop and have fun.

3.8 Day eight (Sunday, 21st July 2019): “Castle drive” by boat on River Elbe.

The participants were picked from the hostels by Marx, took a train to Dresden Center. They joined Prof Feistel, Prof. Bongaerts, Dr. Liu and Kettner for a boat ride to Pillnitz for lunch as the participants reviewed Einsiedel and Chemnitz Visit and the Summer School as a whole. The best three posters were awarded and Nafuna Sharon Wafula from SBESS had third best poster. Every participant was presented with a certificate of attendance. Later in the afternoon the participants took the boat back to Dresden Center and took a walk around the center as they appreciated the architectural designs and history of the structures there on their way back to the hostels.



Figure 6: Summer school participants in Pillnitz after boat ride tour.

3.9 Day nine (Monday, 22nd July 2019)- The Journey Back to Nairobi, Kenya.

The Participants were picked by bus at 0100 hours from the hostels and started off their journey to Berlin Tigel Airport. After the airport clearance the team departed from Berlin by 06:15 hours German time to Nairobi via Paris, France. They arrived in Nairobi, Kenya at 20:55 hours Kenyan time. After clearing at Jomo Kenyatta International Airport Nairobi each participant left to his/her home in different parts of Kenya.

4.0 Conclusion and Recommendations:

The third CEMEREM summer school was successful. The students and the staff learnt a lot and got a good exposure. In SBESS, the participants learnt that continuous project evaluation in terms of cost-benefit analysis is very important to consider whether to terminate a project or continue with it. And where a project is likely to negatively affect the environment and the ecosystem then it is important to know the cost of rehabilitation before engaging. If the cost is too high, then it is not viable. It was also noted that mining activities highly impact negatively on water and land/soil, however these can be restored and utilized for social and economic benefits. The summer school also provided a good exposure to the students and staff on the ‘natural resources management’ in practice when it comes to water, land use, and mining.

There were no incidents of indiscipline, medical issues or injuries reported or experienced during the summer school. The team learnt a lot from Germans’ way of life, the way they do things, their culture

and ate a variety of foods they have never tasted before- some of which they enjoyed and some they did not enjoy; but generally, it was a good experience. Language barrier was one of the biggest challenges the participants faced but they survived it.

Accommodation was okay considering the price they were offered at. The rooms, the beds & beddings were clean and the breakfast was good.

The participants recommend an increase on the duration of the summer school to one month or so and provide an opportunity where they can mingle with the students in those universities maybe in a normal class setting.

Report Done By:



Thomas Makungu
Assistant Lecturer SBESS