MBEYA UNIVERSITY OF SCIENCE AND TECHNOLOGY

WEEKLY RESEARCH SEMINAR SERIES

MUST Community and General Public are cordially invited to attend the 46th Research Seminar Presentation

COLLEGE OF SCIENCE AND TECHNICAL EDUCATION (CoSTE) **DEPARTMENT OF MATHEMATICS AND STATISTICS**

RESEARCH TITLE: Mathematical Model of Human African Disease Transmission and Control Strategies

SPEAKER: Mr. Mlyashimbi Helikumi (MSc. in Mathematical Modeling)

BIOGRAPHY OF THE SPEAKER: Mr. Mlyashimbi Helikumi is an Assistant Lecturer in the Department of Mathematics and Statistics under the College of Technical Education at Mbeya University of Science and Technology (MUST). He holds Bachelor of Education in Mathematics and Master of Science in Mathematical Modeling, both from University of Dar es Salaam (UDSM). Currently, Mr. Mlyashimbi is doing a PhD in Applied Mathematics at the Nelson Mandela African Institution of Science and Technology (NM-AIST). He is doing a research on Mathematical Epidemiology specifically on Models with Vector Borne Diseases like Sleeping Sickness and Malaria.

R-ID NO: 0101

DATE: Wednesday 03rd February, 2021 **TIME: 04:00PM** **VENUE: MUST CONFERENCE AT OLD LIBRARY**

SUMMARY OF THE PRESENTATION: In this study, a fractional-order Trypanosoma brucei rhodesiense model incorporating vector saturation and temperature dependent parameters is considered. The proposed and studied model incorporates the interplay between vectors and two hosts, humans and animals. The basic reproduction number was computed and established results on the threshold dynamics. Meanwhile, the effects of vector control and screening of infected host on long-term disease dynamics was explored. Also, threshold levels which are essential to reduce the basic reproduction number to level below unity at various temperature levels were determined. The findings from this study demonstrated that, vector control and host screening could significantly reduce the spread of the disease at different temperature levels.

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COLLEGE OF SCIENCE AND TECHNICAL EDUCATION (CoSTE) **DEPARTMENT OF TECHNICAL EDUCATION**

RESEARCH TITLE: Levels, Spatial Distribution of Heavy Metals and Transfer Factors of the Selected Heavy Metals in Soil, Irish and Sweet Potatoes Alongside Uyole -Mbalizi Highway Section, Mbeya, Tanzania

SPEAKER: Mr. Phares M.D Petro (MSc. in Chemistry)

BIOGRAPHY OF THE SPEAKER: Mr. Phares M.D Petro is an Assistant Lecturer in the Department of Technical Education under College of Science and Technical Education at the Mbeya University of Science and Technology (MUST). He holds a Diploma of Education in Chemistry/Biology from Butimba TTC, Bachelor of Science with Education in Chemistry/Biology from Sokoine University of Agriculture (SUA) and Master of Science in Chemistry from the University of Dar es Salaam (UDSM). He has more than 22 years teaching experience. Currently, Mr. Phares is the Coordinator for Research at the Department of Technical Education and Coordinator for Risk Management of CoSTE.

R-ID NO: 0102

DATE: Wednesday 03rd February, 2021 **TIME: 04:45PM** **VENUE: MUST CONFERENCE AT OLD LIBRARY**

SUMMARY OF THE PRESENTATION: This research aims to investigate on levels and spatial distribution and transfer factors of heavy metals in soil, Irish and Sweet Potatoes alongside Uyole-Mbalizi Highway Section in Mbeya City, Tanzania. The study will be conducted at Uyole, Simike, Iwambi and Mbalizi localities. Levels of the selected heavy metals will be determined by using Energy Dispersive X-ray Florescence Spectroscopy (EDXRF) and soil analysis will be conducted at TARI-Uyole. GraphPad Demo Instant Software and Origin Pro. Software will be used for data analysis. However, the results obtained will be compared with FAO/WHO standard limits for assessing food safety status. The transfer factors in irish and sweet potatoes will be calculated for correlating with the adverse human health effects (toxicity) that may be posed as the result of their consumption.

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COLLEGE OF SCIENCE AND TECHNICAL EDUCATION (CoSTE) **DEPARTMENT OF NATURAL SCIENCES**

RESEARCH TITLE: The Effects of Bioturbation by the Venus Clam *Cyclina Sinensis* on the Fluxes of Nutrients Across the Sediment–Water Interface in Aquaculture Ponds

SPEAKER: Dr. Regan N. Kavishe (PhD. in Aquaculture Sciences-Aquatic Ecology)

BIOGRAPHY OF THE SPEAKER: Dr. Regan N. Kavishe is a Lecturer in the Department of Natural Science under College of Science and Technical Education at the Mbeya University of Science and Technology (MUST). He holds a Ph.D. in Aquaculture Sciences-Aquatic Ecology, Master's degree in Science of Aquaculture, both from the School of Natural Silences at the University of Ningbo-China and Bachelor of Science in Aquaculture from Sokoine University of Agriculture. He is an expert of Aquatic Ecology including proteomics, macro-algae, macro-vertebrates and Integrated Multitrophic Aquaculture Systems. Dr. Kavishe has more than six (6) years of teaching experience, and he has worked as a Teacher at Tarekea Secondary School and Fisheries Officer at Chamwino District. He has published more than 15 research papers. Currently, he is the Coordinator for Research, Quality Assurance at the Department of Natural Sciences and Member of Research and Publication Committee at CoSTE.

R-ID NO: 0103

DATE: Wednesday 03rd February, 2021 **TIME: 05:30PM** **VENUE: MUST CONFERENCE AT OLD LIBRARY**

SUMMARY OF THE PRESENTATION: This study deployed a mesocosm technique to investigate the effects of bioturbation by the marine bivalve (*Cyclina sinensis)* in aquaculture pond and examine how its bioactivities alter the rate at which materials (inorganic nutrients, dissolved oxygen, organic matter and chlorophyl-a) are exchanged across the sediment–water interface. During the study a dark incubation experiment was performed to determine the fluxes of inorganic nutrients (NH_4^+, NO_3^- + NO_2^- and PO_4^{3-}), benthic chlorophyll *a*, organic matter contents and sediment oxygen consumption rates (SOC). The findings from this study showed that, *C. sinensis* has potential role to control (remove/retain/release) nutrients across the sediment-water interface, and consequently influence mineralization processes. These findings suggest that the activities of the clams had a positive influence on the SOC and the fluxes of inorganic nutrients, hence they can substantially improve the primary productivity and water quality of earthen pond ecosystems.