BRIDGING YOUNG RESEARCHERS WITH THE SDGs

SUMMIT PROGRAM AND ABSTRACTS

MARCH 8-10, 2022

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ORGANIZED BY THE UU-A STUDENT SUMMIT COMMITTEE IN CONJUCTION WITH 7 PARTNER UNIVERSITIES **Bridging Young Researchers with the SDGs**

UU-A STUDENT SUMMIT 2022 SUMMIT PROGRAM AND ABSTRACTS

March 8th-10th, 2022

Organized by the UU-A Student Summit Organizing Committee in Conjunction with 7 Partner Universities



Inter-University Exchange Project Support for the Formation of Collaborative Programs with African Universities **Programme for Developing Human Resource to Contribute to SDGs by Merging African Potential and** Japanese Scientific Technology

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SUMMIT PROGRAM

Summit (Video On-Demand): <u>8-10 March</u>

- Presentations
- Comments and Discussions
- Q&A
- How to Access On-Demand Platform: Please use URL/link, Registration number, and Password you received after registering on the On-Demand Platform as audience
- Participants can refer to the proceedings guidelines to find abstracts and videos (Please see **page vii**)

• Awards and Closing Ceremony (by Zoom): <u>11 March</u>

- Time: 6-7:30pm (Japan); 12-1:30pm (East Africa); 9-10:30am (Ghana)
- Closing remarks by President of Utsunomiya University
- Comments by Professors evaluating presentations
- Remarks by main coordinator for UU-A Student Summit
- Comments by coordinating Professors from the participating universities
- Awards
- Comments by awardees
- Announcements and next summit
- Photo session
- Vote of thanks
- Zoom: (Please connect by Zoom 5-10 minutes before starting time)

URL/Link:

https://us02web.zoom.us/j/85647199687?pwd=WC90QzZYaFQrdVRWK253SmZtSFF DQT09

Meeting ID: 856 4719 9687 **Passcode:** 667724

MESSAGE FROM THE PRESIDENT OF UTSUNOMIYA UNIVERSITY

On behalf of Utsunomiya University, I am very delighted to welcome you to participate to this Student Summit.

This Student Summit is a part of Utsunomiya University Inter-Exchange Project, named "Developing Human Resource to Contribute to SDGs by Merging African Potential and Japanese Scientific Technology", funded by Ministry of Education, Culture, Sports, Science and Technology of Japan.

In Japan, the original project, Inter-University Exchange Project, was started in 2011 with the aim of supporting efforts for international educational cooperation with universities in the target countries and regions. Utsunomiya University was adopted in 2020 with the six universities of Jomo Kenyatta University of Agriculture and Technology and Meru University of Science and Technology in Kenya, Addis Ababa University in Ethiopia, University of Dar es Salaam and Nelson Mandela African Institution of Science and Technology in Tanzania, and University of Ghana.

Our program is aimed to develop human resource who can promote sustainable development based on the potential and social structure of local communities in Japan and Africa. They can contribute to the sustainable development of Africa and Japan.

We have offered online intensive courses for over 200 students of seven universities last September and undertook four international symposiums for around 200 researchers, students, and the public.

This Student Summit is the first conference where overseas master's students gather and make presentations about their research in relation to the perspective of SDGs. By February 27th, 53 students from seven universities submitted presentation videos online. Between March 8th and 10th, the uploaded presentation videos will be checked and evaluated by the researchers of seven universities, and, the evaluated presentations will be honored.

I would like to congratulate each and every one of the students who worked hard and presented their research. I sincerely hope that this Student Summit will be a wonderful opportunity for students to study and present their research results from an international and interdisciplinary perspective. I hope that the continuous development of this program with the cooperation of six African universities and Utsunomiya University will eventually further strengthen the partnership between African countries and Japan.

Thank you very much again for joining and collaborating in this program.

March 7th, 2022

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Ikeda Tsukasa, PhD President of Utsunomiya University

PREFACE

The first UU-A Student Summit, which was scheduled to be held on March 8-10, 2022, is part of the collaboration among 7 universities which are: Jomo Kenyatta University of Agriculture and Technology (Kenya), Meru University of Science and Technology (Kenya), Addis Ababa University (Ethiopia), University of Dar es Salaam (Tanzania), Nelson Mandela African Institution of Science and Technology (Tanzania), University of Ghana (Ghana), and Utsunomiya University (Japan). With concern for the COVID-19 pandemic and the difference of time zones, this summit was held virtually by Video On-Demand with the theme "Bridging Young Researchers with the Sustainable Development Goals (SDGs)." The Summit ended with Awards Announcing and Closing Ceremony by Zoom on March 11 with an exciting session as we congratulated the top 10 best presentations from different majors.

Out of the total 53 presentations, there were three main broad areas of study as follows: Agriculture and Environment & Food Sciences; Engineering & Telecommunication; and Health Sciences & Social Sciences which were delivered by on-demand videos and online interactions platform for comments and Q&A sessions.

Thanks to the keen and vibrant participation of the students and scholars from all participating universities, the UU-A Student Summit was very successful and fruitful.

Student Organizing Committee

ACKNOWLEDGEMENT

Writing this booklet is tougher than we believed and rewarding than we could have ever visualized. None of this would have been thinkable without the collaboration of the seven (7) UU-A universities. We would like to first of all express our deepest appreciation to the President of Utsunomiya University, Prof. Ikeda Tsukasa for his support and commitment towards the success of the UU-A Student Summit. We also eternally express our gratitude to Prof. Tomohide Natsuaki (Utsunomiya University-Japan), Prof. Shinso Yokota (Utsunomiya University-Japan), Prof. Kumiko Sakamoto (Utsunomiya University-Japan), Dr. Yutaro Neriya (Utsunomiya University-Japan), Dr. Raphael Avizanga (Lecturer, University of Ghana), Prof. Romanus Odhiambo (Vice Chancellor, Meru University of Science and Technology-Kenya), Dr. Cynthia Mugo (Technical coordinator, Meru University of Science and Technology-Kenya), Dr. Lilian D. Kaale (Head-Department of Food Science and Technology, University of Dar es Salaam-Tanzania), Prof. Nelson K. Ojijo (Jomo Kenyatta University of Agriculture and Technology-Kenya), Prof. Linus Munishi (Nelson Mandela Africa Institution of Science and Technology-Tanzania), Prof. Bezawork Afework (Avian Ecology and Behavior Department of Zoological Sciences, Addis Ababa University- Ethiopia), Prof. Emana Getu, Entomology Zoological Department (Addis Ababa University- Ethiopia), Prof. Masele Yihune (Animal Ecology and Systematics, Department of Zoological Sciences, Addis Ababa University-Ethiopia), and Prof. Tadesse Fetahi (Addis Ababa University-Ethiopia) for the good work and developing of great and good ideas for the UU-A summit program which has created a good network and familiarity amongst the young researchers globally.

To the evaluators of the presentations we are grateful to extend our gratitude to them for their commitment, sacrifice, and efforts to make this summit successful. Finally, to all participants who took part in the summit: reviewers, presenters, and the audience, we honor and appreciate you for the good work done, sacrifice of your time, and your presence. We are so grateful and thankful to see you again in the future summit.

Student Organizing Committee

STUDENT ORGANIZING COMMITTEE MEMBERS

Jomo Kenyatta University of Agriculture and Technology (Kenya)

- Ms. Sloane Wairimu Mungai
- Mr. Hillary Okoth

Meru University of Science and Technology (Kenya)

- Mr. Victor Kiptoo Kemboi
- Ms. Elsa Gatwiri Wabwile

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- Ms. Anny Gli
- Mr. Roland Kanlisi

Utsunomiya University (Japan)

- Mr. Andrew Charles Frimpong
- Mr. Parinya Khemmarath
- Mr. Stanislaus Acquah

Guidelines for Navigating Table of Presentations, Abstracts, and Videos

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Health Sciences & Social Sciences

Domestic Wastewater as Co-substrate in Textile Wastewater Treatment

Author: Bidu Jerome Michael (E0009)

University: Nelson Mandela African Institution of Science and Technology and KU Leuven

BACKGROUND

Textile companies use huge volumes of water resulting in large amount of wastewater effluents. There are many different types of chemicals used in wet processing which result in wastewater with extremely variable composition of pollutants. Thus, treatment of textile wastewater effluents is necessary before discharge to the environment. Bioremediation technologies for wastewater treatment remain to be economical and sustainable methods.

METHOD

Treatment of textile wastewater with domestic wastewater as co-substrate has been investigated in this research. The treatment was practiced in anaerobic reactor integrated with constructed wetlands. The influence of several parameters was studied which included residence time, textile wastewater fraction and initial pH of the reaction mixture. Pollutant's removal studied and optimized were chemical oxygen demand (COD) and color. The MINITAB 19 statistical program was used to establish a mathematical model for the process. The COD and color removal efficiencies were studied by feeding combined textile and domestic wastewater to the anaerobic reactor at different mixing ratios.

RESULTS

At optimum conditions, it was realized 72% color and 70% COD removal. A longer residence time, higher pH and textile wastewater fraction in range of 0.65 to 0.8 favored simultaneously COD and color removal. The study revealed that, use of domestic wastewater as co-substrate enhanced color and COD removal from textile wastewater.

CONCLUSION

The study has shown that, co-digestion of textile and domestic wastewaters seems to be a promising technology to enhance biological treatment of textile wastewater. Moreover, at specific ratios of textile to domestic wastewater, the optimum simultaneous removal of color and COD can be achieved.

Supervisors: Prof. Karoli Nicholas Njau Prof. Bart Van der Bruggen

Temporal Changes in Metabolite Accumulation and Phytohormone Content in Wheat during Infection Process of Powdery Mildew

Authors: <u>Sato Yuki</u>¹, Shimazaki Taichi¹, Weng Yuanjie¹, Kim June-Sik, Nihei Kenichi¹, Okamoto Masanori¹ (E0013) University: ¹ Utsuomiya University

BACKGROUND

Bread wheat is an important crop that sustains more than one-third of humankind. However, the expansion of arid land due to global warming and the occurrence of diseases are factors that reduce agricultural productivity. Around 5% of the total yield losses caused by wheat pathogens and pests is attributable to wheat powdery mildew (Blumeria graminis). It is known that when plants recognize the attack of pathogens, they accumulate a large amount of the phytohormone salicylic acid (SA) by a hypersensitive response (HR), and consequently the accumulated SA leads to resistance against pathogens. However, it has not been cleared how disease-related active molecules such as SA and metabolite change temporally in wheat during the attack of pathogens. **METHOD AND RESULT**

In my research, the wheat cultivated in pots, in the untreated group and the wheat powdery mildewinoculated group sampled temporally. We conducted the research on the temporal changes in metabolite accumulation by GC-MS and phytohormone interaction among abscisic acid (ABA), SA, and other hormones by LC-MS/MS analysis. In addition, we will conduct gene expression analysis by qRT-PCR in order to characterize disease response. As a result, in addition to SA, it has been discovered that cinnamic acid, which is an intermediate in SA biosynthesis and other disease-related compounds increased after the pathogen infection.

CONCLUSION

In this research, we would like to link the molecular relationship between metabolite and gene expression during infection processes with wheat powdery mildew, and elucidate the regulatory mechanism of diseases response.

SIGNIFICANCE TOWARDS ACHIEVING THE SDGS

It is possible that drought-tolerant and disease-resistant wheat can be cultivated all over the world by applying the findings from our research to molecular breeding in wheat and it will lead to stable production of food in the world. Our research will contribute to SDGs No.2 "Zero Hunger" and No.13 "Climate Action".

Supervisor: Assoc. Prof. Okamoto Masanori

Impact of Aid on Inequality: The Case of Spatial Inequality in Ghana and Japanese Aid through TICAD

Author: Acquah Stanislaus (E0018) **University:** Utsunomiya University

BACKGROUND

There have been debates on the impact of aid on poverty reduction and addressing inequality. One of Ghana's development challenges is the north-south spatial inequality, whereby the southern part of the country is relatively more developed in comparison to the northern part. As an aid receiving country, aid from many donors have contributed to Ghana's development. This research examines the allocation of Japanese aid projects between the north and the south of Ghana to identify how they contribute to address spatial inequality.

OBJECTIVE

The objective of this research is to examine how aid relates to inequality in developing countries, with the case of Japanese aid to Ghana.

METHODOLOGY

This research basically identified Japanese aid projects in Ghana, both government-to-government and grassroots community level projects, and how they have been allocated between the northern part and the southern part of Ghana. Interviews were also conducted with stakeholders on both types of Japanese aid projects to understand factors influencing the allocation of both aid projects.

FINDINGS

Although previous research shows that small-scale aid programs/projects (like grassroots) may be more effective at reducing inequalities than large-scale aid programs/projects at the national level (like government-to-government), this research finds that depending on the aid policies of the donor country in this case Japan, and the development strategy of the receiving country, in this case Ghana, large-scale aid may influence the allocation of small-scale aid projects in a way that deepens or reduces inequality, particularly spatial inequality.

CONCLUSION

In conclusion, the southern part of Ghana that receives more Japanese government-government projects, particularly for economic development also receives more grassroots projects than the northern part. This draws the attention of both donor and aid recipient countries to reconsider their aid policies to help achieve SDG 10 of reducing inequalities.

Supervisor: Prof. Kumiko SAKAMOTO

History and Curriculum of Secondary Education TVET in the Republic of Ghana

Author: Frimpong Andrew Charles (E0019) University: Utsunomiya University

BACKGROUND AND PROBLEM STATEMENT

Technical and Vocational Education and Training (TVET) is embraced in the development agenda of nations across the world because of its potential of supplying the manpower needs for industries. With the technological advancements, the TVET curricula should provide students with relevant skills and a solid scientific and technological foundation to solve new issues.

OBJECTIVES

This paper explores the philosophical views, approaches, and contributions of key actors toward TVET expansion before, during, and after colonization. It seeks to bring clarity on how the concept of vocationalisation of secondary education was initiated in Ghana in addition to the nature of TVET curricula during the pre-colonial, colonial, and post-colonial dispensations. Finally, it examines the role of key stakeholders in the development of the pre-tertiary TVET curriculum and the distinctive features between the old and a new curriculum framework.

METHOD

The methodologies for this research consist of documents analysis and interviews. Annual reports on education and educational policy documents were accessed from the Public Record and Archives Administration Department (PRAAD), the Ministry of Education, and the School of Oriental and African Studies (SOAS) of the University of London. In addition, representatives of industries on the pre-tertiary curriculum development body were interviewed.

RESULTS

The provision of TVET education was based on human and socio-economic development. The vocationalisation of secondary education eliminated the gender division which hitherto was associated with the TVET curriculum. This study argues that the skill discrepancy between the demand and supply in the TVET field emanates from the implementation of the TVET curriculum rather than at the development phase.

Conclusion and Significance to SDGs

A quality TVET curriculum is essential in equipping learners with employable skills for decent employment and also, responsibly selecting materials that are environmentally friendly for production.

Supervisor: Maruyama Tsuyoshi (Associate Professor)

Study on the Potential Entrepreneurial Characteristics of the Household Producers of Rice in Lao PDR: the Case Study of Savannakhet Province's Three Zones

Author: Khemmarath Parinya (E0022) University: Utsunomiya University

BACKGROUND

Lao PDR's majority is engaged in subsistence agriculture. Although its rice production surpasses the consumption quantity since the late 1990s, insufficiency of rice is prevalent at the subnational level. To promote a regionally integrated development, the government emphasizes entrepreneurship that means commercializing activity for value-adding. However, the entrepreneurial literature in Lao PDR is still limited. Therefore, this study aims to identify who is the entrepreneur in the primary agricultural context of Lao PDR.

METHOD

Through the method of zoning and random sampling, Savannakhet Province, which is the most prominent region of rice production, has been divided into 3 zones (Along Mekong River, Intermediate, and Mountainous Zones) with a village per zone and household samples of 31.31% of total households, 37.78%, and 22.22% respectively. The analysis was conducted applying Mann-Whitney U Test, Kruskal-Wallis Test, One-Way ANOVA, effect size, and correlation analysis to show the significance and the correlation of variables.

RESULTS

The result shows that the Lao household producers are outstanding in terms of independence and hard-workings which are the characteristics of the striving/learning stage while tending not to risk socio-emotional wealth (SEW) (food sufficiency and mutual assistance). Concerning that entrepreneurship has its fundamental in uncertainty encountering and commercialization, Lao entrepreneurs balance the SEW and commercial activity through the management of the commercial size of the main product and the sale frequency of byproducts.

CONCLUSION

This study contributes to SDGs 1 and 8. Regarding SDG number 1, urging commercializing activity of rice product would steer domestic economy and improve food security. For goal number 8, in order to erase the conventional thinking that sees agriculture as a labour trap, the production can be improved to be more market-oriented. Therefore, local producers can appreciate their production without shifting to other sectors.

Supervisor: Prof. Dr. Kumiko Sakamoto

Development of a Laser Processing Machine for Automatic Parameter Optimization in SPB (Scanning Parallel Beam) Method

Author: Nakamura Yuta (E0023) University: Utsunomiya University

BACKGROUND

This study was conducted on experiments of laser micro-grooving for the purpose of creating an automatic laser processing machine.

There is an expectation for the automation of laser processing by applying the technology of holographic laser processing, where the experiments can be done remotely and the parameters can be set automatically.

METHOD

In the automatic focusing and processing system, we will implement the interlocking of the sensor that detects the surface displacement of the sample and the objective lens. In addition, we will build a system that can obtain height information and measure the processing results on the spot by two-dimensional plane measurement using the surface displacement sensor.

The sensor used is the CL-3000 sensor from KEYENCE, which can detect the surface position and convert the displacement amount into data that can be input to an external device. The amount of displacement is input to the piezoelectric element attached to the objective lens, which enables the interlocking of the objective lens.

RESULTS

It is now possible to measure the surface in parallel with the measurement.

In addition, by processing while compensating the surface displacement, uniform laser processing on the sample can be realized, which may be applied to laser grooving in the industrial field.

CONCLUSION

In the future, our goal is to make it possible for students and faculty to process the desired specimen from anywhere at any time, to automatically define the parameters and experimental conditions for laser processing, and to fully automate the laser processing equipment itself. In addition, the aspect of enabling processing with minimal use of lasers could create an industrial and technological social base in the SDGs aspect.

Supervisor: Prof. Yoshio Hayasaki

Biochemical Characterization of Strigolactone Biosynthetic Enzymes in Sorghum for the Control of Root Parasitic Plants

Author: Yoda Akiyoshi (E0025) **University:** Utsunomiya University

BACKGROUND

Sorghum (*Sorghum bicolor*) is an important cereal crop, but suffers serious yield losses caused by the root parasitic plant *Striga hermonthica* in sub-Saharan Africa. Root parasitic plants germinate only when they recognize strigolactones (SLs) secreted from the roots of host plants and then parasitize on host roots. SLs consist of the ABC-ring system connected to the methylbutenolide D ring via an enol-ether bridge and are divided into two groups, strigol-type having a β -oriented C ring and orobanchol-type having an α -oriented C ring. Sorghum typically produces strigol-type SL, but a defect in *LOW GERMINATION STIMULANT 1 (LGS1)* gene alters the predominant SLs to orobanchol-type SL. Orobanchol-type SL is weaker than strigol-type SL at stimulating on *S. hermonthica* seeds, so that the loss of function in LGS1 results in *Striga* resistance (Gobena et al., PNAS, 2017). *LGS1*, which encodes a sulfotransferase, is thought to be an enzyme involved in strigol-type SL biosynthesis, but its enzymatic function has not been demonstrated. In this study, we have investigated the SL biosynthesis pathway catalyzed by LGS1 in sorghum.

METHODS & RESULTS

To find a LGS1 substrate, possible SL precursors were analyzed in the root exudates of WT and the *lgs1* mutant by LC-MS/MS. It was found that 18-hydroxycarlactonoic acid (18-OH-CLA) was accumulated in the *lgs1* mutant compared to WT, indicating that 18-OH-CLA is a possible substrate for LGS1. Then, we incubated 18-OH-CLA with recombinant LGS1 proteins expressed in *E. coli* and *Nicotiana benthamiana*. The recombinant LGS1 proteins produced 5DS and its stereoisomer from 18-OH-CLA depending on a sulfate donor.

SIGNIFICANCE TOWARDS ACHIEVING THE SDGS

My study will contribute to Zero Hunger of SDGs. *Striga* seeds germinate by recognizing SLs secreted by the host roots and infect. Therefore, it is possible to control infestation of root parasitic plants by manipulation of SL biosynthesis.

Supervisor: Associate Professor Takahito Nomura

The Imaging of Microplastics Consumed by Marine Life Using Full-Stokes Polarization Camera

Author: Endo Nobuaki (E0026) **University:** Utsunomiya University

BACKGROUND

In recent years, there have been concerns about marine pollution caused by microplastics and its impact on human health. To solve the problem, quantification of microplastics in seawater is required. By establishing a cheaper and faster measurement method, we can contribute to solving SDGs 6 and 14.

METHOD

Plastic materials exhibit optical birefringence, in which the refractive index differs depending on the direction of light vibration due to orientation of molecular bonds in the material. By measuring the birefringence with a polarization camera, it is possible to detect plastics inside biological tissues. In this experiment, we measured polystyrene and PET. We also observed how these particles were taken up by small shrimp called brine shrimp. The experiment was performed with a full-Stokes polarization camera attached to a microscope, from which can image all polarization states.

RESULTS

Our experiments show that it is possible to measure the birefringence of polystyrene and PET using a polarization camera. Birefringence of the plastic is also observed in a video of the digestive tract of brine shrimp that takes up those particles. Outside of the movie, the particles were observed to be expelled from the tail.

CONCLUSION

A new quantification method for microplastics using a polarization camera is proposed. This method is rapid and capable of quantifying microplastics. In the future, we intend to use wavelength dispersion characteristics to identify the type of plastic.

Supervisor: Prof. Otani Yukitoshi

Composition and Bioactivity Potential of *Diospyros capricornuta* against *Aspergillus flavus* and *Aspergillus parasiticus*

Author: Ngowi Princess William (E0033) University: University of Dar es Salaam

BACKGROUND

Diospyros capricornuta is an endemic species widely distributed along the coast of Tanzania that is used as food condiment and traditional medicine. The chemical compositions of *Diospyros capricornuta* leaves, stem and root bark extracts and their bioactivity potential against *Aspergillus flavus* and *Aspergillus parasiticus* were investigated to contribute to SDG 2 and 3.

METHOD

Hydrodistillation, maceration and Soxhlet extraction was performed on the leaves, stem and root bark samples of *D. capricornuta* and their resultant extracts were analyzed by Gas chromatography mass spectrometry (GC-MS). Antifungal and antiaflatoxigenic bioassays of the Soxhlet extracts of *D. capricornuta* at the concentrations of 0, 62.5, 125 and 250 μ g/mL were carried out using poisoned food method and High-Performance Liquid Chromatography (HPLC) was used for aflatoxin analysis.

RESULTS

A total of 36 compounds were identified from the leaves, stem and root bark extracts of *D. capricornuta* among which; 2,4-di-*tert*-butylphenol and octahydro-1H-indole were found as most abundant in the leaves, stem and root bark extracts of *D. capricornuta*. All the parts of *D. capricornuta* inhibited growth and aflatoxin production of *A. flavus* and *A. parasiticus* at the concentration of 62.5 μ g/mL by >50%.

CONCLUSION

Diospyros capricornuta is a potential medicinal plant and may be used as a source of natural antifungal against *Aspergillus flavus* and *Aspergillus parasiticus*.

Supervisors: Dr. Lillian D. Kaale Dr. Juma A. Mmongoyo

Drone Technology amidst Climate Crisis

Author: Okumu Maxiwel (E0035) University: Jomo Kenyatta University of Agriculture and Technology

BACKGROUND

Climate crisis is seriously ravaging the globe that has resulted in the altering of millions of lives and even claimed hundreds of lives. We have to mitigate Climate crisis and increase preparedness that promotes SDGs 9, 12 and 13.

METHOD

In Drones amidst climate crisis, the drones are fitted with Thermal cameras and Sensors. The sensors detect the level of moisture and Greenhouse Emissions in the space at any given altitude above sea. Thermal cameras detect the temperature variations at any given time frame. This then Forms a Drone system in space. The Drone System is incorporated with an integrated disaster management system.

RESULTS

The role of the integrated disaster management system is to provide immediate response of mitigation or Give an alert for preparedness based on trends established over Time. The immediate response established by the system should compensate for or outcast the effect or crisis delivered over a period of Time. The system focuses on reduction of carbon footprint, Maintaining optimum temperatures and a Normal Humid state. The responses range from policies on flights and high Emission travels, directives on industrialization, Mandatory Tree planting, waste mitigation and Use of Electrical Appliances.

CONCLUSION

The application of Drone technologies in the midst of Climate Crisis could be very essential in mitigation of carbon footprint, Temperature variations and Humid state and as well promote preparedness to save lives and the entire Globe from this tragedy especially the underserved population groups that are seriously affected by droughts and famine yet they have limited contribution towards climate change.

Factors and Outcomes Associated with Lost to Follow Up among Children Attending Paediatric Respiratory Clinic at Mama Lucy Kibaki Hospital

Authors: <u>Andai David</u>, Lloyd Chris, Mercy Nthenya, Jonah Njuguna, Immaculate Akoth, Caleb Wekesa (E0039)

University: Jomo Kenyatta University of Agriculture and Technology

BACKGROUND

Respiratory infections are particularly problematic in the Low- and Middle-Income Countries where the disease burden is great and growing. There is need to target interventions for improving adherence to medical care and optimizing long-term prognosis where access to health care facilities is limited, this will be vital towards contributing to SDG 3. This study aimed to identify the reason and clinical outcome of children and adolescents who were lost to follow-up at a Pediatric Respiratory Clinic in Nairobi, Kenya.

METHODS

A descriptive cross sectional study design was done among children attending Pediatric Respiratory Clinic together with their parents/caregivers between May 2021 and July 2021. Phone call interviews were conducted to determine the reason of being lost to Follow Up.

RESULTS

28 (33%) from a sample of 84 patients, were identified as lost to follow up, with a mean age of 4.29 years. The most prevalent diagnosis was asthma (n=16, 57.1 %) with allergic rhinitis (n=13, 28.6%) being the most common comorbidity. Most common reason for being lost to follow up was, the child felt well (n=7, 27%). No association was found between the baseline clinical characteristics of the children and the clinic follow up at a p value of 0.05. No mortality was reported on the outcome and (n=8, 30.7%) developed complications.

CONCLUSION

Children becoming lost to follow up in the clinic is dependent on the caregiver's perception on the child feeling well. There is need to address lung health in pediatrics and develop strategies to improve children follow up to help lessen disease burden in order to promote good health and well-being.

Supervisors: Dr. Justus Simba Dr. Alex Kigundu

Mobile Voting System (M-KURA)

Author: Gwatai Nicholas Mugambi (E0043)

University: Jomo Kenyatta University of Agriculture and Technology

BACKGROUND

Voting requires a high level of integrity and efficiency for credible results, thus there is a need for a seamless voting system that ensures that votes cast are well secured, that is to avoid rigging of votes and the voting process is user friendly ensuring the voters get to vote with ease, this contributes to SDG 9.

METHOD

M-KURA the mobile voting platform uses USSD technology to allow conducting elections through mobile devices. The application is built around technologies such as PHP, MySQL databases, and web services. The system runs on the network allowing its users to remotely vote from the convenience of their phones.

RESULTS

M-Kura improves the current voting system by doing away with the physical counting of votes cast, replaced with remote computerized tallying of votes this enhances the integrity of an election. It does not require recurrent spending on purchasing ballot papers and boxes. M-Kura is not limited to internet connectivity as it utilizes GSM.

M-Kura does away with long queues and also gives the voters the convenience to vote remotely, does not require hiring a lot of labor to coordinate the election since the system is fully automated, it ensures the security of votes as the system is encrypted and can be audited, last but not least with M-Kura, in case of invalid selection by the user the system detects and replays the voting menu to ensure valid selection thus no spoilt votes. The system will only be available to registered voters who will only vote once.

CONCLUSION

Let's appreciate the efficiency, convenience, and integrity of USSD voting brought by M-Kura which will revolutionize voting in the world.

Supervisor: JkuatTechexpo

Assessment of Infection Prevention and Control Program and Adherence to National Guidelines on the Use of Personal Protective Equipment in the Setting of Covid-19 among Healthcare Personnel at Mama Lucy Kibaki Hospital

Authors: <u>Barasa Wanyonyi Ignatius¹</u>, Richard Odamoh, Mwaniki Betty¹, Caren Emadau, Godfrey Mayoka¹, Rosemary Kawira¹, Franklin Muchiri¹ (E0044) **University:** ¹Jomo Kenyatta University of Agriculture and Technology

BACKGROUND

Coronavirus disease (COVID-19) is caused by novel coronavirus (SARS-CoV-2) which compromises normal lung functioning. The disease was declared a global pandemic in January 2020, resulting in increased morbidity, mortality, and healthcare cost. Health facilities remain a high-risk area for transmission of COVID-19, thus putting healthcare workers (HCWs) at a higher risk than the general population. The objective of this study was to assess the Infection Prevention and Control (IPC) program and adherence to national guidelines on the use of PPEs among HCWs in Mama Lucy Kibaki Hospital (MLKH) which is in line with SDG 3 and 17.

METHODOLOGY

The study adopted a descriptive cross-sectional design among 231 HCWs. Data on adherence to the use of PPEs were collected using well-structured questionnaires, whereas assessment of the facility IPC program was done using the WHO IPC Assessment Framework (IPCAF) tool.

RESULTS

MLKH IPC program scored a total of 687.5/800, putting the facility at an advanced level. The core component 5 on multimodal implementation of IPC was the only one with a score of 100/100. Core component 7 on workload, staffing & bed occupancy and core component 4 on Healthcare-Associated Infections (HAIs) surveillance scored the least at (65/100) and (75/100), respectively. The majority of HCWs (95.3%) had access to PPEs within the facility. The face mask was the most utilized PPE (99.6%), with face shield (12.6%) and headgear (14.3%) being the least utilized. Only 33% of the HCWs reused face masks, and a large proportion (50.6%) did not adhere to the appropriate doffing practice. Most HCWs (62%) were trained on the use of PPEs, and the majority (95%) had access to alcohol-based sanitizer.

CONCLUSION

The MLKH IPC program is at an advanced level, and the facility needs to address the gaps in workload, staffing, and infection surveillance. The majority of HCWs were adherent to the national guidelines on the use of PPEs with identified gaps in donning and doffing practices and reusing of PPEs despite a robust IPC program.

Review of Closing the Gender Gap: Women's Right in Ethiopia and Mexico

Author: Eden Kibret Kassie (E0048) University: Addis Ababa University

BACKGROUND AND PROBLEM OF STATEMENT

Large gender disparities persist in educational outcomes, labor-force participation, remuneration, informality status, and hours of unpaid childcare and housework. While the adoption of new regulations has a lot of promise for gender equality, that potential is impeded not just by violence but also by other subtle hurdles such as cultural perceptions of gender, employment discrimination, and educational obstructions.

OBJECTIVE

• To examine the gender inequality in Ethiopian and Mexico specially due to culture and economy

METHODOLOGY

We use the secondary data source to get data and statistical data analysis method to analysis and discuss the results of the findings.

RESULT

According to the statistics, the gender disparity in Labor Force Participation Rates (LFPRs) in Ethiopia has shrunk from 22.4 percentage points in 1990 to 9.3 percentage points in 2017. In Mexico, the gender disparity in LFPRs has likewise narrowed, from 51.1 percentage points in 1990 to 35.2 percentage points in 2017. As a result, not only is the gender gap in labor force participation significantly less in Ethiopia than in Mexico, but Ethiopia has also achieved greater progress in terms of relative success in narrowing the gender gap in labor force participation. In education for instance, Female net school attendance rates in Ethiopia have grown dramatically over the previous two decades, rising from 26.6 percent in 1998 to 82.3 percent in 2016. Mexico, on the other hand, has had nearly universal primary school attendance since 1998, with no notable gender disparities. **CONCLUSION**

The review tries to demonstrate how women in Mexico and Ethiopia face systematic oppression by evaluating social and cultural norms. While women have legal safeguards under the law and the constitution, the culture in which they live perpetuates a cycle of discrimination and violence. Despite the fact that both nations have a number of organizations dedicated to development and empowerment, they have done nothing to alter the norms and structures that maintain women's subordination in society. As previously noted, after spending 7-10 years promoting women's rights and representation, both nations continue to suffer with low levels of women's educational attainment, work participation, and earnings.

Supervisor: Genene Shiferaw (PhD)

Engaged Buddhism in Thailand and Japan Which Has Roles in Poverty Alleviation: A Case Study on Rissho Kosei-kai in Japan and Wat Suan Kaew in Thailand

Author: Nophira Phitchapha (E0054) University: Utsunomiya University

BACKGROUND

This interest in social engagements of Buddhists is partly due to the popular image of Buddhism being a religion and being disengaged from social or worldly affairs. However, in recently years there are many Buddhist organizations have been involved in social activities especially poverty alleviation. Accordingly, I will clarify what roles and activities they perform in poverty alleviation activities by the original interpretation of Buddhist thought.

METHOD

This research uses the concept of engaged Buddhism and takes up the aspect of poverty alleviation as an issue, also takes the Suan Kaew Temple in Thailand, in addition the Rissho Koseikai in Japan as examples. A literature review and interview survey will be conducted.

RESULTS

Mahayana Buddhism refers to the path of Bodhisattva striving and also called "Bodhisattva Vehicle" aims to save all human beings based on the Bodhisattva faith. Therefore, members of the Rissho Koseikai are actively motivated to participate in social activities by their recognition and sense of responsibility as Buddhists for religious reasons such as "practice of Bodhisattva". On the other hand, the ideal way for social activities of Suan Kaew Temple in Thailand is to rescue the poor by modernization and focusing on religious activities with an emphasis on achieving enlightenment by the monks themselves.

CONCLUSION

Mahayana Buddhism such as Rissho Koseikai aims to spread Buddhist teaching through poverty alleviation activities. On the other hand, Theravada Buddhism participates in society by running various poverty alleviation movements to rescue the poor without being involved in a large-scale international movement.

Supervisor: Prof. Shigeta Yasuhiro

Macronutrient Loss Associated with Food Waste in Café of Addis Ababa Science and Technology University (AASTU)

Author: Gebermedhin Getnet Kiros (E0057) University: Addis Ababa University

BACKGROUND

Various researchers have reported that one third of food that we produced were wasted per capital per year in the globe which can cover daily recommended intake of millions mouth. So, we have to manage our food production and consumption patterns to contribute to SDGs 12, 1 and 2.

METHODS

Exploratory cross-sectional study conducted at the University of Addis Ababa Science and Technology. Crude food waste (plate leftover) data converted into its equivalent macro nutrient loss based on local food composition data and the results of laboratory-based analysis of nutrient composition of the food. The collected data entered and processed by SPSS, to analyze the descriptive statistical analysis.

OBJECTIVE

To assess the magnitude of macronutrient loss that has potential to narrow the gap in food energy inadequate intake along with food waste and loss (FWL) at the consumer level and to suggest required amount based on supposed portion size.

RESULTS

The prevalence losses, Energy 13538 MJ, 107 protein, 517 Carbohydrate, 71 total Fat, 2,104 dietary fiber Kg per capita per day. Macronutrient loss between female and male show significant difference. There were significant difference in Carbohydrate equivalent loss (t (348df) = 0, P P<0.01) in the scores with mean score for Female (M= 269.4, SD= 37.5) was lower than Male (M=294.6, SD= 34.0), Energy equivalent loss (t (348df) = 2.84, P<0.05) in the scores with mean score for Female (M= 1655, SD= 188). The magnitude of the difference in the mean (mean difference = -55.1, 95% CI: -93.2 to -16.9) was significant. Using dietary carbohydrate as an example, 517g carbohydrate loss mean that 55% more of the Recommended Dietary Allowance for an average 1870 adults and the amount of wasted Macronutrients are equivalent to cover the gap for 3738 adults' food energy requirement per day. **CONCLUSION AND RECOMMENDATION**

This was the first study to document the loss of macro- nutrients from selected common staple food waste in the Institution based food supply. Even if only a small portion of discarded food can practically be made obtainable for human consumption, efforts to redistribute surplus foods where appropriate and prevent food waste in the first place could increase the availability of nutrients for needy, while saving money and natural resource.

Supervisor: Dr. Zelale Debebe

Perception of Discrimination in Japan by Foreigners Living in Japan

Author: Mbiru Peter Kimani (E0061) University: Utsunomiya University

BACKGROUND

As more foreigners settle in Japan, a country generally considered to be homogeneous, the chances of discrimination and cultural misunderstandings increase. This is a research that seeks to gain understanding of the differences of perceptions of discrimination in Japan as perceived by foreigners compared to as perceived by Japanese locals. The goal is to understand perception misunderstandings and raise general awareness of discrimination in society. This research will contribute to SDG 3, 5, 8, and 10.

METHOD

Conduct interviews with foreigners living in Japan seeking insights into their perceptions of discrimination and any past experiences that may have molded their perceptions. Based on results of foreigners' interviews, formulate questionnaires for conducting interviews with Japanese people. Questionnaire format:

1. Basic statistical information about the participant.

2. A section of multiple-choice questions regarding participants' views/opinions/perceptions of discrimination in general.

3. A brief long form writing section for explaining in more detail anything participants may want to expand on.

The questionnaire will end with an invitation to participate in a brief online interview.

The details gained from this data will be analyzed to seek patterns, commonalities and hopefully greater insights into how discrimination can be better tackled.

DISCUSSIONS/EXPECTED OUTCOME

I expect that perceptions of discrimination between foreigners and Japanese people will vary greatly. There will also be many misunderstandings between foreigners and Japanese locals.

CONCLUSION AND SIGNIFICANCE TOWARDS ACHIEVING THE SDGs

The results of the study will be useful for formulating policies that aim to harmonize society and help schools sensitize their staff and student bodies to discrimination thus creating a more welcoming and inclusive environment.

My research touches on 4 of the SDGs.

Goal 3: Good health and well-being

Goal 5: Gender equality

Goal 8: Decent work and economic growth

Goal 10: Reduced inequalities

Supervisor: Prof. Kumiko Sakamoto

Proximate Composition and Energy Values of Stiff Porridge Prepared from Different Flour Blends

Author: Amwoma Lorraine Moindi (E0062)

University: Meru University of Science and Technology

BACKGROUND

Stiff porridge is an African cuisine and in Kenya it's popularly known as *ugali*. It's a source of energy, macro nutrients and micro nutrients. It is commonly prepared from maize flour but sorghum, millet, cassava or composite flours can be used. Despite it being a popular staple food, little information is available in literature on the proximate composition of stiff porridge from various cereal grains, cassava chips and composite flours.

OBJECTIVE

The objective of this study was to determine the proximate composition and energy values of stiff porridge prepared from maize, millet, sorghum, cassava, cassava-millet, cassava-sorghum, maize-millet, maize-sorghum, cassava-millet-sorghum and refined (soko) flour.

METHODOLOGY

The Association of Official Analytical Chemists (AOAC, 2016) was used to determine: Moisture content (MC) using the oven drying method, protein content by Kjedhal method, fat content by soxhlet method, crude fiber by Hennenberg and Stohmann method, ash content by dry ashing method (muffle furnace) and carbohydrates by difference 100-(fat+protein+ash+fiber+MC). Energy content was determined using the Atwater general system in which the energy values of fats are 9Kcal/g, proteins and carbohydrates are 4 Kcal/g(Merrill & Watt, 1955).

RESULTS/DISCUSSIONS

The neglected crops including millet, cassava and sorghum are sources of energy, protein, fat and fiber. Stiff porridge prepared from composite flours will help reduce any form of deficiency in either crop being used. The energy content provided by whole maize stiff porridge is the highest compared to the other stiff porridges.

CONCLUSION

Stiff porridge can be prepared from these cereal grains and root tubers. They are a source of macro nutrients and or micronutrients. This will help end hunger and promote good health and well-being to the people.

Supervisors: Dr. Rebecca Ebere Prof. Joshua Arimi

Volumetric Exposure Methods for Volumetric 3D Printers for Sustainable Manufacturing

Author: Iizumi Kazuma (E0063) University: Utsunomiya University

BACKGROUND

In recent years, there has been a lot of interest in sustainable manufacturing, which means producing what you need on the spot. This is made possible by 3D printing. However, 3D printers take a lot of time to manufacture.

METHOD

We propose a new method of volumetric exposure, which is an evolution of the traditional 3D printing method of stacking.

In contrast to the two-photon absorption method of 3D printing, we have explored the possibility of volumetrically exposing a laser point in three dimensions using a computer hologram to create a three-dimensional optical field.

RESULTS

We used the results of a simple experiment to carry out a simulation to see how the shape would vertical expanse. As a result, we were able to estimate that if the NA is more than 0.6, the modeling point can be drawn without any problem. In addition, by using the WGS method with the angular spectrum method, we were able to create a 3D computer hologram and expose a 3D pattern. In the future, we hope to use the results of visual simulations and other techniques to carry out experiments in which volume exposure is applied to two-photon fabrication.

CONCLUSION

Through our work on the application of volumetric exposure to two-photon fabrication, we have suggested that "sustainable manufacturing" with 3D printers is on the way.

Supervisor: Prof. Hayasaki Yoshio

Desert Locust Control with Mass Breeding and Releasing Of Large Birds at Desert Locust Affected Area of Ethiopia

Author: Woga Wakjira Getachew (E0067) University: Addis Ababa University

BACKGROUND

The short horned grass hopper in the family Acrididae, Desert locust (*Schistocerca gregaria* Forskal), will be the great challenge in the future of Ethiopian crop production. Desert locust which is species of locust is periodically swarming. The place desert locust found mainly in, Africa, through West Asia and Arabia, South Asia part is where the locust extends. So, controlling of desert locust with large birds mass rearing and releasing to the desert locust affected area is our objective of SDGs.

METHOD

Mass rearing of desert locust at laboratory or rearing area and releasing of these reared birds to desert locust affected parts of the country. Following how these birds feed and disturb desert locust at the released area. Crop damage occurred due to desert locust outbreak and incidences, severity of the desert locust at the area have to be taken.

RESULTS

This observation was taken from Jimma Agricultural Research Center when desert locust was occurred and disappeared by birds. At the time there was video taken that large birds disturb desert locust and make them restless not to eat vegetation of the surrounding. Without any damage to the crop desert locust outbreak at the time was managed by these birds.

CONCLUSION

I conclude that efforts have made to control desert locusts at Ethiopia by governments with chemicals which have side effects on the environment and human health. But controlling of this desert locust with other safe methods as well as sustainable method is the best practice.

Determinants of Age at First Marriage among Ever-married Women Aged 15-49 in Nigeria

Author: Hassan Umar Abubakar (E0072) University: University of Ghana

BACKGROUND AND PROBLEM STATEMENT

Nigeria ranks the 9th country with the highest child brides and by 2050, it is projected to have the most significant number in the world. The median age at first marriage and the median age at first birth was very low at 17 and 19 years respectively. Also, the use of contraceptives (any method) was deficient at 17%. Therefore, marrying at this younger age is associated with a high risk of school dropout, unemployment and poverty, sexual abuse and domestic violence, infant and maternal mortality, high population growth, etc.

OBJECTIVES:

1. To examine the relationship between the socio-demographic, economic, and cultural factors

on age at first marriage.

2. To find out the determinants of age at first marriage.

METHODOLOGY

The study used the latest Nigeria Demographic Health Survey (2018). The Pearson chi-square test of significance and multinomial logistic regression were used at the bivariate and multivariate levels respectively.

RESULTS

At the bivariate level, all the study variables (age at sexual debut, educational level, employment status, current age, ethnicity, region of residence, religion, type of place of residence, and wealth status) were highly significant at p-value < 0.001. However, when controlling for other variables at the multivariate level, religion and type of place of residence were found not to be significant. While current age, age at sexual debut, ethnicity, region of residence, educational level, wealth status, and employment status were statistically significant predictors of women's age at first marriage.

CONCLUSION AND SIGNIFICANCE

Despite the effort made by the Nigerian government, non-governmental organizations, and concerned individuals on tackling the issue of early marriage, the effect of the determinants still persists. This study will contribute to achieving SDG 5.3 aimed to eradicate all harmful practices like early marriage and other education and health-related SDGs.

Supervisor: Dr. (Mrs.) Faustina Frempong-Ainguah

Strategic Management Practice and Universal Healthcare Service Delivery in Nairobi County, Kenya

Author: Wabwile Elsa Gatwiri (E0075) **University:** Meru University of Science and Technology

BACKGROUND

Universal Healthcare (UHC), implies that all citizens have access to suitable preventive, rehabilitative, promotive and protective healthcare when in need and within affordable costs. Incorporation of appropriate strategies in the health sector is essential in the realization of SDG 3. Kenya began steering universal health coverage in 2018; however, UHC realization is not yet at 100%, a situation that can be attributed to lack of appropriate strategic approaches in health management. The main objective of the study was to establish the effect of strategic management practice on universal healthcare service delivery in Kenya focusing on Nairobi County, Kenya.

METHODOLOGY

A descriptive research design was employed with a target population of 74 public health centres located in Nairobi County. The unit of observation comprised of two employees from the strategic department in each facility. Both descriptive and inferential statistics were used in data analysis. **RESULTS**

Strategic Leadership, ICT Innovation, Human Capital Management and Communication Practices positively and significantly affects universal health care service delivery in Nairobi County, Kenya. **CONCLUSION**

Adoption of strategic management approaches while dealing with the health issues bear the possibilities of enhancing the delivery levels of health services to deserving citizens and increasing reachability.

Supervisor: Dr. Anthony Sije

Left behind Children in Bangladesh, Impact of Parental International Migration on

Children Educational Outcomes

Author: Khalilullah Ibrahim (E0077) **University:** Utsunomiya University

BACKGROUND

Parental international migration has an important role for developing economy in Bangladesh. Although, it has created problem for their left behind children on educational outcomes. Parental outbound migration is increasing a lot and their children have been impacting.

OBJECTIVES

The main objective is to find out impact of parental migration on children's educational outcomes.

METHOD

This is a cross sectional study. In Bangladesh, where a large proportion of children have been experiencing separation from one or both parents due to parental migration. Therefore, it is reasonable to examine whether children from migration families are more susceptible to poor educational performance in this country. The impact and influence on children will get by comparing the academic result of under 18 years of left behind children with the non-left behind children.

RESULTS

Most existing research has focused on the importance of remittances and found that remittances received from migration could support the family left behind by minimizing economic risk and overcoming capital constraints. On the other hand, some research has found negative consequences of parental migration for the mental health of children left behind, there was no relationship between parental migrations and children's Empirical studies of academic performance indicate that left-behind children perform more poorly than other children in school.

Therefore, provision of mentoring to migrant children, home visiting program, school performance statistics, implementing counselling intervention for psychological support can be given by government to left behind children.

CONCLUSION

The outcome of this research would be useful for the government and education policy planners. On the part of the government, it would influence policy formulation on education for left-behind children in Bangladesh. This is related with SDGs 4th goal.

Supervisor: Prof. Yasuhiro Shigeta
Rediocesium Migration of Large-Diameter Deciduous Broad-Leaved Trees Affected by the Fukushima Nuclear Accident

Author: Nakajima Kaoru (E0078) University: Utsunomiya University

BACKGROUND

The Great East Japan Earthquake struck on March 11, 2011, and the Fukushima Daiichi Nuclear Power Plant accident released a large amount of radioactive substance to the outside, and most of it was deposited in the forest. An initial deposition of 101,926 Bq/kg was observed in a beech forest in Mt. Takahara, northern Tochigi Prefecture.

METHOD

So, this study measures radioactive cesium (^{137}Cs) in large-diameter beech and oak trees and predicts their distribution. The study sample was collected from each of beech, Japanese beech, and oak tree in the forest in northern Tochigi Prefecture. The wood disks from tree were divided into bark and xylem parts, and the xylem parts were sampled and crushed at a radius of 4 cm. After grinding, the radioactive Cs (^{137}Cs) in the bark and xylem measured with a germanium semiconductor detector.

RESULTS

The concentration of ¹³⁷Cs in the wood of beech and Japanese beech trees was high at the outer wood of the disk when the disk height was 11.3 m or less, and the concentration was high in the inner wood when the disk height was higher than 13.3 m. On the other hand, oak tree had higher ¹³⁷Cs concentration in sapwood than heartwood at all heights. In terms of the accumulation ratio of ¹³⁷Cs by the height of the beech bark and wood, the tree had ¹³⁷Cs, which was about 70-80 % of the whole tree. The bark of oak tree has a lot of ¹³⁷Cs, so the amount of accumulated sapwood was also a value that cannot be ignored.

CONCLUSION

In large-diameter beech trees, it is expected that the concentration of 137 Cs will increase in the center of large diameter area in the future. In large-diameter oak trees, it is expected to continue to have a high concentration of 137 Cs in sapwood.

My research on forests is related to the goals of the SDGs (12) and (15). Previously, radioactive contamination made the food and timber produced in the forest unavailable. In order to continuously produce and utilize forest resources, it is necessary to investigate whether they are harmful. This intention is related to (12). A better environment can be provided by considering appropriate management methods for radioactively contaminated forests. This helps (15).

Supervisor: Prof. Ohkubo Tatsuhiro

Investigation of Genes Involved in Strawberry Flowering Control

Author: Ryo Nakamura (E0079) University: Utsunomiya University

BACKGROUND

Basically, the conversion to the reproductive growth phase is once a year. However, by controlling the growth phase transition, it is possible to cultivate and harvest at a time different from the current one.

METHOD

Experimental target organs such as stem apex, leaves, and roots were excised from fully grown strawberries, RNA / cDNA was prepared based on them, and quantitative real-time PCR was performed. This work was performed multiple times while changing the target gene, and the effect on flowering was investigated.

RESULTS

It was found that TFL1, which suppresses strawberry flowering, is highly expressed in roots as well as in the shoot apex, which is generally considered to have a high expression level. It was also shown that the AGL gene cluster, which has an effect on flowering as well as TFL1, is highly expressed in the roots.

CONCLUSION

Until now, it has been obtained that the shoot apex occupies most of the role of strawberry flowering, but the results of this study suggest that the roots may also have a great influence on flowering. Was done. In the future, by advancing this research subject, it will be possible to promote free flowering in strawberries, which is expected to enable strawberry cultivation in a time and environment where normal flowering does not occur.

Supervisor: Prof. Takeshi Kurokura

The Role of Non-Governmental Organizations in the Attainment of SDG Four

Author: Abagi Saraphina Abila (E0081) University: University of Ghana

BACKGROUND

In Africa, the implementation of the SDGs has primarily been directed towards structural change and developing the human capacity of the African (Sinha, Sengupta, & Alvarado, 2020). This has largely rested on the promotion of lifelong education and attaining equal access to quality education across nations and tribes.

The challenge however has been the growing concerns of politicization of education and the seeming lack of acknowledgement and attention to the contribution NGOs are making towards the development of education. This research investigates the roles of education focused NGOs in Ghana, their contribution to changing the narrative of education as well as ascertaining the effects of the perceived non-recognition by Governments.

METHOD

A qualitative approach to data analysis was employed in this research. Data was gathered by purposively sampling education focused NGOs operating in the Northern Regions of Ghana. The choice of region was influenced by reports by the Ghana Education Service on education in the Country. The Lead for Ghana Initiative, Campaign for Female Education, the Ministry of Education-Ghana, The Ghana Education Service and the Northern Association of Educational NGOs were major respondents for this research.

RESULTS

Findings from the data received prove that, NGOs have contributed immensely to the promotion of access to quality education in the country. Over 30% of students from deprived families have continued their education through the activities of these NGOs. Better qualified and innovative teachers are being deployed, structures and access to funding have improved all by the activities of these NGOs.

CONCLUSION

There is a need for Governments to stop politicization of education and acknowledge the efforts of NGOs to better their motivation to promoting access to quality education.

Supervisor: Dr. Frederick Boamah

Developing Business-Information Technology Alignment (BITA) Continuity Management Framework for Ethio telecom

Author: Habtamu Abune Funsa (E0082) University: Addis Ababa University

BACKGROUND AND PROBLEM OF STATEMENT

Nowadays within a dynamic business world and technology advancement achieving and sustaining continuous business information technology alignment has a great contribution towards SDG 9 and SDG 8 which is building resilient infrastructure, promoting inclusive and sustainable industrialization, and fostering innovation. In any industry achieving and sustaining continuous alignment is the key to enhancing industry performance, meeting stakeholder expectations, promoting sustainable industrialization, and gaining competitive advantage. However, achieving and sustaining continuous alignment is a challenge for top management. As ethio telecom is Africa's oldest telecom operator and the only telecom service and product provider in Ethiopia to enhance sustainable industrialization in the country, help more people keep connecting to the digital world, meet stakeholder expectations, sustain economic growth and foster innovation should have adopted continuous business and information technology alignment (BITA).

OBJECTIVES

The main objectives of the study are to develop a BITA continuity Management framework based on the current status ET and extensive literature review that allow ET to have flexible and adjustable BITA within the changing environment.

METHOD

The researcher intended to use design science research methodology to develop the proposed BITA continuity management framework. The study collected data through a semi-structured interview, observation, and document analysis from Ethio telecom business and IT division executives, directors, managers, and experts selected through purposive sampling techniques. The researcher intended to analyze the collected data through qualitative thematic analysis techniques.

RESULT

Achieving and sustaining continuous alignment has remained the top management challenge for any organization particularly for the telecom industry. Therefore, having a framework that helps to have adjustable and flexible BITA will help ethio telecom to be the world-class telecom industry as a result economic growth of the country will be enhanced.

CONCLUSION

Ethio telecom as the only telecom operator in the country to bridge the digital divides and to promote sustainable industries development in particular in Ethiopia and generally in Africa should have to practice or implement continuous business-IT alignment throughout its organization. The more Ethio telecom enhances it is business-IT alignment practice the more facilitates sustainable development of the country. Thus, this will allow Ethio telecom to be competitive within a dynamic technology environment to connect more people online / digital world and get benefits from technological progress.

Supervisor: Million Meshash (Ph.D.)

The Relationship between Paddy Rice on the Condition of Single Basal Application of Total Nitrogen Fertilizer in the Nursery Box and High Density Seedling

Author: Kato Makoto (E0087) University: Utsunomiya University

BACKGROUND

Raising nursery and topdressing work in paddy rice cultivation have become heavy work because of changed the situation, which is polarized large and small farming, aging farmer in Japan. The combination of them has the following advantages: firstly, it can reduce the cost of raising seedlings and fertilizer application, the time for sowing and transporting seedlings. Secondly, it is an environment-friendly fertilizer application which have less water pollution for the reason of high fertilizer utilization efficiency. From these things, they apply to No. 9 and No.15 of the SDGs. **PURPOSE**

In field test, we researched how much fertilizer could apply to healthy nursery and cultivation from both points of growth and yield.

METHOD

The seeding amount was 160g per box and 250g per box by dry paddy, and the test variety was "Asahinoyume". The dedicated fertilizer "Naebakomakase N400-100" was put in the seedling box. The test plots were set to "Plot of reduced fertilizer by 20% and dense seedling", "Plot of reduced fertilizer by 40% and dense seedling", "Plot of dense seedling only", "normal plot". The survey was carried out seedling quality, planting accuracy, growth, and yield component.

RESULTS

In term of brown rice weight per are, "Plot of reduced fertilizer by 20% and dense seedling" was 56.9 kg, "Plot of reduced fertilizer by 40% and dense seedling" was 50.7 kg, " plot dense seedling only" was 44.8 kg, "normal plot" was 52.6kg.

CONCLUSION

Seedlings was healthy, and the yield and quality were comparable or better than normal one even by reducing amount of the special fertilizer last year.

Supervisor: Prof. Takahashi Yukitsugu

Functional Analysis of Aberrant Protein Phosphatase 2 C in Parasitic Weed Striga

Author: Fukuhara Daisuke (E0088) University: Utsunomiya University

BACKGROUND

Striga propagates in semi-arid regions and parasites the root of cereal grasses. *Striga* shows an abscisic acid (ABA) insensitive trait, and therefore transpirations from the leaves are more intense than the host plant. As the result, it is thought that *Striga* efficiently deprives water and nutrients from the host plants by utilizing transpiration gap between *Striga* and the host. Previous study has suggested that ShPP2C1, which is one of the protein phosphatase 2Cs in ABA signaling pathway, is responsible for ABA insensitive phenotype in *Striga*. ShPP2C1 has unusual five amino acid residues neighboring the conserved W residue among PP2Cs, and the conserved W is important for binding to the ABA receptor. Therefore, it is thought that these specific mutations inhibit the interaction between the ABA receptor and ShPP2C1. However, it is still unclear which amino acid residue of ShPP2C1 is responsible for ABA sensitivity. In this study, we have identified key amino acid residues of ShPP2C1 associated with ABA sensitivity.

METHOD

A series of artificial PP2C mutations (AtABI1 mutations with substitutions of 1, 3, and 5 amino acid residues), in which the Arabidopsis PP2C (AtABI1) was substituted with different numbers of the five amino acid residues of ShPP2C1 in *Striga*, were generated and compared for biochemical and phenotypic analysis.

RESULTS

Although the phenotype of ABA hyposensitivity was observed from the substitution of one specific amino acid residue, it was found that the substitution of three amino acid residues near the W residue of PP2C was necessary for the strong ABA hyposensitivity.

CONCLUSION

Striga propagates in semi-arid regions and parasites the root of cereal grasses. *Striga* causes reduced growth and seed production in its hosts, which is a major obstacle to agricultural production, especially in sub-Saharan regions such as Sudan. We have identified key amino acid residues of ShPP2C1 associated with ABA sensitivity. By elucidating the biological characteristics of *Striga* at the molecular level, we will be able to curb the damage caused by *Striga* in the future and contribute to the SDGs of "zero hunger.

Supervisor: Associate Professor Okamoto Masanori

Comprehensive Analysis of Metabolites in Response to Drought Stress in Wheat

Author: Weng Yuanjie (E0089) University: Utsunomiya University

BACKGROUND

Global warming expands the arid land in the world, and drought stress is one of the environmental factors that dramatically reduces agricultural productivity. Of the three major crops, wheat is widely cultivated in semi-arid region, and its productivity is often affected by drought. Improving the drought stress tolerance of wheat is essential for increasing food supply. As such, it will contribute to SDG 2.

METHOD

In previous studies, drought-tolerant wheat (TaPYLox) was developed by overexpressing the phytohormone abscisic acid (ABA) receptor, which is a key gene for the drought stress response. TaPYLox has acquired both drought stress tolerance and water-saving trait, which enables efficient grain production with less water. In this study, TaPYLox was used to identify ABA-dependent and -independent drought stress-responsive gene expressions and metabolites.

RESULTS

L-serine and Tagatose increased in an ABA-dependent manner. On the other hand, branched chain amino acids, L-valine, L-leucine, and DL-isoleucine increased under drought stress conditions in an ABA-independent manner, while drought-tolerant TaPYLox showed a weak increase in branched chain amino acids. Conversely, under drought conditions, the contents of 3-dehydroshikimic acid and alpha ketoglutaric acid were reduced.

CONCLUSION

In this study, we would like to understand the drought stress response of wheat at the metabolic level and discuss how it can be used for wheat breeding. This will provide a basis for research to improve food productivity and production, and to build sustainable food production systems.

Supervisor: Asso. Prof. Okamoto

Construction of Japanese Soil-Borne Wheat Mosaic Virus Vector Expressing Fluorescent Protein

Author: Fukushima Chika (E0097) University: Utsunomiya University

BACKGROUND

Japanese soil-borne wheat mosaic virus (JSBWMV) belongs to the genus *Furovirus* and causes yellow mosaic disease in wheat and barley. JSBWMV is transmitted by plasmodiophorid *Polymyxa graminis*, which parasitizes the plants' roots and survives in the soil for many years. For this reason, the only feasible control measure is a development of resistant cultivars. However, resistance genes of the plants to JSBWMV have not yet been identified. For screening resistance genes, it is helpful to use fluorescent virus vector to visualize the susceptibility/resistance of the plant to the virus. Therefore, in this study, we constructed virus vectors that fluoresces in barley and wheat, which contribute crop protection and relate SDGs 2 and 15.

METHOD

We made many types of virus vectors, each with a fluorescent protein gene (Green Fluorescent Protein (GFP) or AzamiGreen) at different sites of JSBWMV genome. As for inoculation, *in vitro* transcripts of JSBWMV infectious cDNA clones and sap of virus vector-infected plant leaf were used as source of rub inoculation.

RESULTS

According to previous studies, *Nicotiana benthamiana*, a dicotyledonous model plant, were inoculated with *in vitro* transcripts of many types of virus vectors to confirm their infectivity. Some of them successfully infected with the virus and showed green fluorescence systemically. However, barley and wheat did not infect with any virus vectors by sap inoculation using infected *N*. *benthamiana* leaves. There may have been some barriers to the viral vector during the transmission from dicotyledons to barley and wheat. Therefore, I inoculated Johnson grass (*Sorghum halepense*), one of monocotyledonous weeds, with CP-2A-AzamiGreen- Δ RT, one of virus vectors by sap inoculation. The sap inoculation from the Johnson grass showing green fluorescence to barley and wheat was also successful to show green fluorescence.

CONCLUSION

This is the first report on the development of fluorescent protein-expressing virus vector in the genus *Furovirus*. It is expected that the screening of resistance genes will be accelerated by using this viral vector

Supervisor: Asso. Prof. Nishigawa Hisashi

In Vitro culture, Microtuberization and Fortification of Three Selected Kenyan Irish Potato Varieties

Author: Mungai Sloane Wairimu (E0098)

University: Jomo Kenyatta University of Agriculture and Technology

BACKGROUND

Worldwide, the potato holds the distinct position of being the fourth most important root and tuber food crop, most especially in sub-Saharan Africa. However, numerous challenges such as limited clean seed, nutrient deficiencies of microplants and *in vivo* soil-borne pathogens handicap production; therefore, new strategies enhancing availability of clean seed potato are necessary. Consequently, understanding the link between *in vitro* nutrient enhancement and seedling vigor under field conditions may mitigate challenges faced by microplants.

METHOD

Experiments were set up to evaluate potato varieties Shangi, Unica and Dutch Robjyn for enhanced regeneration, calcium (Ca) fortification and *in vitro* tuberization. Cuttings were subcultured onto modified MS media with five levels of Ca (8.8g/L, 10.4g/L, 12g/L, 13.6g/L and 15.2g/L CaCl₂). Microtubers were stimulated on MS media supplemented with 60g/L brown sugar and 6mg/L 6-Benzylaminopurine. The experiment was set up in a completely randomized design replicated three times.

RESULTS

The three varieties differed significantly (p<0.05) in regeneration capacity expressed by shoot and root number. Excess calcium caused significant increases (p<0.05) in root number for the three varieties while shoots for Unica were highest (5.57 ± 1.2) in 8.8g/L Ca. Moreover, excess calcium caused an increase in root-zone and mid-stem Ca content by 45% and 292% for Shangi and Dutch Robjyn respectively compared to their control. Number of microtubers per variety ranged from 0 to 1, with Dutch Robjyn producing highest number of microtubers (1.00 ± 0.0) at 12g/L CaCl₂. In conclusion, under excess calcium in culture medium, varieties Dutch Robjyn and Shangi showed better regeneration and microtuberization in comparison to variety Unica. In addition, even at lower calcium levels, Shangi "packs" more calcium than Dutch Robjyn.

CONCLUSION

This confirms the optimization of a microtuberization and fortification protocol by Ca enhancement as a potential new technology, for scaling up the production of clean and quality seed.

Supervisors: Cornelius Wainaina Agnes M. Kavoo-Mwangi Mwashasha Rashid Mwajita

Studies on the Molecular Mechanism of Infectivity of Criniviruses Infecting Tomatoes

Author: Kobayashi Mayu (E0101) University: Utsunomiya University

BACKGROUND

Tomato chlorosis virus (ToCV) and tomato infectious chlorosis virus (TICV) (genus *Crinivirus*) cause a decline in tomato production. In the development of methods for the control of plant viruses, it is important to understand the mechanisms of infectivity. In this study, we tested whether RNA2 ORF1 (p4) is a movement protein (MP) required for cell-to-cell movement to learn more about the molecular mechanisms of infectivity of ToCV and TICV.

METHOD

Nicotiana benthamiana plants were agroinfiltrated with ToCV p4 or TICV p4, respectively, together with GFP. The positive and negative control was used with potato virus X (PVX) p25, a known MP, and GUS, respectively. Five days after inoculation, we observed whether the fluorescence of GFP migrated to adjacent cells by using confocal laser scanning fluorescence microscopy. The average number of migrated cells in 50-70 cells in each test section were counted. **RESULTS**

When ToCV p4 and TICV p4 were co-inoculated with GFP, it was observed that GFP fluorescence diffused into the surrounding cells. The average number of migrated cells were 2.54, 2.70, 2.27, and 0.04 in the ToCV p4, TICV p4, PVX p25, and GUS test section. ToCV p4, TICV p4 and PVX p25 had significantly higher mean cell migration than GUS. It was shown that the function of ToCV p4 and TICV p4 resulted in cell-to-cell movement of GFP.

CONCLUSION

In this study, ToCV p4 and TICV p4 induced cell-to-cell movement of GFP. It was suggested that these viral proteins are MPs. Further studies are needed to determine how these proteins promote cell-to-cell transfer and whether there are other proteins involved in this process.

Supervisor: Asst. Prof. Yutaro Neriya

Studies on the Biosynthesis of an Aroma Compounds in Saccharomyces Cerevisiae

Author: Huang Shuai (E0104) University: Utsunomiya University

BACKGROUND

2-Phenylethanol (2-PE) is an aromatic alcohol compound with rose aroma, which is widely used in cosmetics and food industry. 2-PE is produced by microorganisms because it is safe as a catalyst and the cost is lower than that of extraction from plants. 2-PE can be produced from phenylalanine metabolism via Ehrlich pathway. Of these, in the final step, phenylacetaldehyde is converted to 2-PE. The most important enzymes in this conversion have not yet been fully identified. The purpose of this study was to explore the involvement of the *S. cerevisiae* in the final steps of different alcohol dehydrogenases (ADH1-ADH7, SFA1). This innovation of sustainable production technology can promote SDG 9 and 12.

METHOD

The parent strain *S. cerevisiae* BY4741, the ADH gene-deficient strains and gene expression strains were used in this study. The cells were inoculated into natural medium (YPD), defined synthetic complete medium (SC) and phenylalanine medium (Phe). 2-PE was extracted from the culture medium with dichloromethane and analyzed by GC-MS.

RESULTS

We compared the 2-PE production capacity of different alcohol dehydrogenase gene deficient strains and overexpression strains of *Saccharomyces cerevisiae* BY4741. The 2-PE yield of ADH3 gene deficient strains were relatively lower than that of the parent strain. Meanwhile in the rich-phenylalanine medium, correctly raising the ratio of leucine in the culture can help yeast cells adapt to the excess phenylalanine. When the level of leucine is 0.4-0.8g/L in a medium containing 10g/L phenylalanine, the ability of cells to proliferate and production 2-PE were considerably enhanced.

CONCLUSION

ADH may be affected by other rate regulating enzymes, and the co-overexpressed cells have the possibility of mass production of 2-PE.

Supervisor: Prof. Maeda Isamu

Effects of Conservation Agriculture on Soil Health and Maize Production in Kenya

Author: Kemboi Victor Kiptoo (E0106)

University: Meru University of Science and Technology

BACKGROUND

Degradation of soil health in ASALs regions in Kenya has been contributed by continuous tillage of land which has caused a decline in crop production for food sustainability both to livestock and humans. The aim is to enhance sustainable farming to the people living in ASALs region in Kenya and improve their well-being. Therefore, we have to advance to new strategies on land preparation to improve and reservice on the soil health contributing to SDGs 1, 2 and 13.

METHOD

Use of zero tillage in areas exhibiting (ASALs) regions to ensure minimal soil disturbance. Planting holes (basin-like) was made and normal conventional ploughing was done on maize production. Weeding was done using selective herbicides to clear vegetation. Maize crop planted using the recommended spacing. Initial soil physical properties and chemical properties and growth parameters evaluated. The growth and yield parameters were evaluated.

RESULTS AND DISCUSSION

The soil moisture content improved due to increased water percolation. This also contributed by reduced soil exposure to direct sunlight by soil cover by cutback weeds. The soil pH improved and increased from pH 5 to about pH 6.5 which is suitable for sustaining any food crop production. Conservation agriculture also increases carbon sequestration which contribute to reduction in greenhouse gas effects.

CONCLUSION AND RECOMMENDATION

Conservation agriculture is the best solution to degraded soil in ASALs areas to enhance and improve soil health. This strategy will help to increase production of sustainable foods and livestock feeds from maize stalks.

Supervisor: Prof. Masinde Peter

What is Wrong about Human Rights in Africa?

Author: <u>Kyomuhendo Clare</u>¹, Aderomola Adeola and Olawale Olayide (E0107) University: University of Ghana

BACKGROUND

Despite of the human rights instruments, violations of human rights in Africa continue to exist especially on the vulnerable people in communities. Moreover, it is strongly believed that protecting human rights is a roadmap for African countries to achieve the Sustainable Development Goals (SDGs). Therefore, it is important to clearly identify the various human rights and their relationship to the SDGs, the progress of human rights in Africa, while showing evidence on how some human rights have been violated. This will help make recommendations for improvement which is a stepping stone for achieving the 2030 SDGs.

METHOD

Systematic literature review of various human rights literature in African countries was applied in this study, to get relevant and up to date information for the study.

RESULTS

Children's right to education and health is jeopardized. For example, 60 million global primary school-aged children are expected to drop from school by 2030, with more than half from Africa. Also, African women face gender-based violence, and many economic, and social challenges. They continue to suffer harmful traditional practices like witchcraft accusations, and female genital mutilation. COVID-19 increased the violations of right to life, including torture, inhuman treatment, arbitrary arrest and detention by security forces deployed to enhance compliance with lockdown measures. Furthermore, women and children's vulnerability to domestic violence rose sharply.

CONCLUSION

Human rights violations are likely to disrupt the process of achieving the SDGs by 2030. Say, goals 1 (no poverty), 2 (zero hunger), and 3 (good health and wellbeing) are affected due to social and economic interferences. Also, goals 4 (quality education) and 5 (gender equality) are affected due to learners being out of school and rising violence against women respectively. Hence, governments need to integrate gender perspectives in every ministry and national human rights institutions. And a comprehensive legal protection system for vulnerable and marginalized families is needed for reducing disparities in accessing quality basic services that support children.

Beyond the Mask: The Work-Life Balance of Female Nurses of Eldercare Homes during Covid-19

Author: Anambane Golda (E0109) **University:** University of Ghana

BACKGROUND

This paper explored the work-life balance of female nurses of the eldercare homes during the Covid-19 lockdown and closure of schools period in Ghana.

METHODOLOGY

The paper adopted a qualitative research methodology and focused on a multi-case study approach. The claims of the paper are based on primary data, which were gathered through face-to-face indepth interviews and in-depth telephone interviews with eleven (11) respondents. The paper employed the Textual Thematic Analysis as the analytical technique for analysing the data.

FINDINGS

The study revealed that for female nurses in the eldercare sector, work-life balance transcends the achievement of fewer role conflicts to cover emotional and psychological wellbeing. In the period under study, transformations were made in the operations of eldercare homes with little concern for the need for work-life balance. In the event of pandemics, employers are more likely to sacrifice the work-life balance of female employees for organizational gains. Factors such as changes in the operations of eldercare homes, increased familial duties, and anxiety aggravated the inability of female eldercare home nurses to achieve a healthy work-life balance. The predominant strong social cohesion and family ties were helpful in females' adaptation of work-life balance coping strategies. Other females than males (not even husbands) served as strong social support systems for females in the study context.

CONCLUSION

The findings of the study is significant to providing decent work for women even in the face of pandemics and the achievement of gender equality at the workplace.

Supervisor: Prof. Charles Ackah

Land Ownership Security, Farm Investments and Maize Productivity among Smallholder Farmers in Tanzania: Evidence from Panel Data

Author: Nassary Samwel (E0113) University: University of Dar es Salaam

BACKGROUND:

Inadequate land-related investments exacerbate low agricultural productivity in agricultural dependent economies like Tanzania. The nexus between land ownership security (possession of official land title) and farm (land-related) investments and implications in agricultural productivity is still an open debate. Therefore, we have to work on policies aimed at improving land ownership security and thus subsequent effects on farm investments and productivity to contribute to SDG 15.

METHOD

The application of fertilizers, intercropping maize with leguminous and irrigation practices as the good agricultural practices were selected as farm investments indicators which summed to form an ordinal variable. Random effects Ordered Probit regression was used to measure the causality effect of secured (or not) land on farm investments. Thereafter, Plot fixed effect as econometric techniques were used to examine the effect of farm investments on agricultural productivity. We used 2061 farm plots as a sample size.

RESULTS

The secured farm plot is associated with an 8.9 points lower probability of not receiving any of the farm investment types, a 4.9 percentage points higher probability of receiving one of the farm investments types, and a 4.0 percentage points higher probability of receiving two or three farm investment types. The farm invested with either two or three farm investments increases maize yield by 24.3% while only one farm investments increase yield by 10.3% compared to no-farm investments at all.

CONCLUSION

We advise the enforcement and emphasis on land ownership security among farmers to promote the good agricultural practices to increase farm yield.

Supervisor: Dr. Martin Julius Chegere

Utilisation of Browse Forages by Smallholder Cattle Farmers in Democratic Republic of the Congo (DRC)

Author: Barwani Kichochi Didier (E0114)

University: Jomo Kenyatta University of Agriculture and Technology

BACKGROUND AND PROBLEM STATEMENT

In the DRC, the extensive pastoral system comprising transhumant and agro-pastoralist is the predominant form of cattle farming, facing numerous constraints such as the unavailability and low quality of pastures preventing farmers from achieving the SDGs no. 1, 2, and 3. Cattle provide food (SDG no. 2) and serve as a source of income (SDG no. 1). This study aimed to assess the factors determining the utilisation of browse forages as livestock feeds.

METHOD

A cross-sectional design was used to collect data from cattle farmers. An econometric model was used to analyse the factors that influence the decisions of farmers to use browse forages as livestock feeds.

RESULTS

Results indicated that the utilisation of browse forages as livestock feeds was high (63%) and influenced (P<0.01) by gender of the household head, education level, group membership, ownership of indigenous cattle, ownership of improved cattle, ownership of goats, milk production perception, milk production quantity, milk sales, milk price, legume production, crop residue usage and location of the smallholder cattle farmers.

CONCLUSION

We conclude that the results are essential to inform the formulation and implementation of policies that promote the adoption of the use of browse forage as livestock feeds to improve livestock production in order to achieve SDGs no. 1, 2 and 3.

Supervisors: Dr. Isaac M. Osuga Dr. Mathew G. Gicheha Prof. Dieudonné M. Katunga

Assessment of Nutritional Knowledge, Attitude and Practices of Mothers with Children Aged 0-5years and Relationship Child Nutritional Status

Author: Koech Josphat (E0115) University: Meru University of Science and Technology

BACKGROUND

Malnutrition results from a mismatch between nutrients need and intake such as protein-energy in children in many developing countries. Parents with better knowledge on nutrition feed their children properly to avoid child malnutrition. There is limited research studies on the impacts of nutritional knowledge, attitude and practices of caregivers or mothers on malnutrition of children below five years. Therefore, the aim of this study is to assess nutritional knowledge, attitude, and practice (KAP) of mothers or caregivers with children under 5 years and how this relates to the children nutritional status. This will contribute to SDGs 3, 4 and 17.

METHODOLOGY

The study will adopt a cross-sectional analytical study design and will be carried out in four major level 4 hospitals in four Sub-counties in Meru County. Data will be collected by anthropometric measurements and researcher administered questionnaires and focus group discussions. Anthropometric measurements will be analyzed using WHO anthro which will convert raw anthropometric data into anthropometric indices of WAZ, WHZ, and HAZ and compare them with the WHO reference data. Data collected in the questionnaire will be statistically analyzed for frequency, descriptive statistics, correlation and chi-square to evaluate associations in SPSS. **RESULTS**

Assumption drawn is that malnutrition is closely associated with knowledge, attitude, and practice (KAP) among caregivers and mothers.

CONCLUSION

It is envisaged that data from this study will provide important information especially when designing and implementing malnutrition mitigating initiatives or programs. This study will contribute to attaining the SDGs 3, 4 and 17.

Supervisors: Dr. Alfred Mariga PhD Dr.Erick Awuoche, PhD

Battle against Waste Generation and the SDGs

Author: A-ingkonge Atiwine Bertha Awinebisa (E0117) University: University of Ghana

BACKGROUND

Solid waste mismanagement is a global issue in terms of environmental contamination, social inclusion, and economic sustainability, which requires integrated assessments and holistic approaches for its solution. Studies reported that, in sub – Saharan Africa, the amount of waste generated is 180 million tons. In Ghana, the rate of waste generation is increasing at an alarming rate, which translates into about 12,710 tons of waste per day. It is estimated that throughout the country only about 10% of solid wastes generated are properly disposed of. A large proportion of the solid waste generated by the residents (between 30 to 50%) are never collected for disposal and so end up in streets, drains, streams which then create breeding grounds for diseases. This contributes to climate change and air pollution and directly affects ecosystems.

METHOD

A cross-sectional survey was conducted to investigate the problem. Both primary and secondary data was collected. Primary data was gathered through observation and secondary data was obtained from waste management organizations and the Accra Metropolitan assembly. Data was analysed using descriptive statistics.

RESULTS

The study found that waste management in Ghana is still greatly based on uncontrolled dumping and littering and domestic burning. This mismanagement leads to serious health and environmental problems. Also, it was observed that waste collection is one of the most common services provided at a municipal level. In certain communities, the waste is disposed in a central container or collection point where it is picked up by the municipality and transported to final disposal sites. Open dumping is prevalent in most communities in Ghana, where landfills are not yet available.

CONCLUSION

Since waste generation is an inevitable consequence of all processes where materials are used, it important to resort to prevention which is the highest priority on the waste hierarchy. It is therefore necessary residents are sensitized on the consequence of waste produced since they generate a large proportion of it. Again, a system perspective of waste management allows an integrated approach not only to the five basic functional elements of waste management itself, but to the problems arising at the interfaces with the management of energy, nature conservation, environmental protection, economic factors like unemployment and productivity, etc. (Sushil, 1990). The battle against waste needs government action quickly and also more awareness should be given to the masses on waste management and its prevention.

Supervisor: Mr. Philip Dorsah

Small-Scale Farming Mini-Tractor

Author: Nzioki Peter (E0119) **University:** Jomo Kenyatta University of Agriculture and Technology

BACKGROUND

Farm mechanization in small-scale farming is hampered by high capital input required and large size of farm machinery such as tractors. This has led to low productivity levels and inefficient land use. An increase in productivity and better land use will contribute to SDG 2 and 8.

METHOD

A motorcycle is used due to low capital requirement and compact size which improves maneuverability. The engine is modified to increase power and fuel efficiency. The chassis uses uprated suspension components, wheels and braking systems to improve handling. A tool hitch is attached to the frame to pull drawn implements such as ploughs and harrows.

RESULTS

The engine power increased by 67% (12hp to 17.9hp). Mid-range torque increased enabling ease in pulling of implements. The wheels and suspension geometry increased stability and maneuverability. The motorcycle performed well in dry sandy and loam soils during tilling. The compact size eased its use in small spaces. Other roles performed were transportation particularly in rural areas without developed road networks. An idea for running an irrigation pump from the engine is currently under development.

CONCLUSION

We consider that the mini-tractor is a viable farming machine for small-scale farming activities especially in Africa with multi-role functions.

Supervisor: Prof. Urbanabus Mutwiwa

Measurement Method of Fiber Optic Transceivers Using Encircled Flux and Encircled Angular Flux

Author: Bor Munkhzaya (E0122) **Institution:** Utsunomiya University

OBJECTIVES

I have been researching the background of automotive optical data transmission systems and devices. Nowadays, in automotive industries, it is required to transmit high-rated data for automotive sensors. To transmit the high-rated data, automotive fiber optic transceivers (FOTs) are used, which should perfectly be suited for the harsh automotive environment and are designed to meet and even exceed the latest requirements for car networks. In my research, I investigate and demonstrate a quantitative evaluation of the output beam of fiber optic transceiver (FOT) using encircled angular flux (EAF) and encircled flux (EF) for future standardization methods.

TARGET SAMPLE/LOCATION

In general, there are two types of multimode optical fiber cable; step-index multimode cable and graded-index multimode cable. Using LED (Light-emitting diode), it has already been defined step-index multimode cable's computation of the output power of the beam by IEC (International Electrotechnical Commission). Nevertheless, there is no international standardization and measurement method to be defined using the graded-index multimode cable silica and plastic relate to fiber optic transceivers. The target of my investigation is to standardize a new measurement method. Moreover, that can be suited to standard requirements using the laser.

EXPECTED RESULT

For now, the expected result is too far from my experiment results. When the laser propagates through the plastic and silica multimode cable, it is given some attenuation and losses. That attenuation depends on the properties of the materials of the transceivers and fiber's lengths. In technically, the laser will generate more power at lower temperatures with a steady decrease until the upper-temperature limit is reached when developing and testing graded-index multimode cable. Most importantly, to minimize those measurement errors and attenuation, it is necessary to measure again.

Influence of Soil Moisture Regimes on Chia Growth and Yield in Semi-Arid Zone of Kenya

Author: Muriithi Moses Njoka (E0123) **University:** Meru University of Science and Technology

BACKGROUND

Kenya is endowed with arid and semi-arid zones where water is a limiting factor. Exotic crops such as Chia (*Salvia hispanica* L.) which are believed to be drought resistant could help in solving the problem. Production of Chia in Kenya will contribute to SDG 2 and 13

METHOD

A field experiment was carried out in two seasons (March-July and June-September 2021). A randomized complete block design was used, plants were subjected to two water treatments (water scarcity and well-watered (90%)) in different growth stages (seedling, vegetative, flowering and maturation). Data collection was taken on growth and yield parameters.

RESULTS AND DISCUSSION

Continuously watering significantly increased ($p \le 0.05$) vegetative growth and yield of Chia plants. Plants that did not receive water had significantly lower vegetative growth as compared to plants that did not receive water at different growth stages. Growth of a plant is usually dependent on the nutrients and water available for plant uptake. Increase in cell division is high when there is adequate moisture for the plant. Water scarcity has been found to affect the rate of photosynthesis due to decreased CO₂ in the chloroplasts.

CONCLUSION

The study established the importance of adequate soil moisture on the initial growth stages of Chia. Chia is a drought resistant crop hence an important crop in achieving SDG 2 and 13.

Supervisors: Prof. Peter Masinde Dr. Cynthia Mu

Analysis of Liver-Specific Effects of Tryptophan on Protein Synthesis

Author: Obeng Kodwo (E0124) University: Utsunomiya University

Tryptophan is an essential amino acid that is used in the biosynthesis of protein. This presentation discusses the effects of L-Tryptophan on liver and skeletal muscle protein synthesis through the mechanistic target of rapamycin complex 1 (mTORC1) pathway in 5 weeks old male Wistar rats, providing the mechanism on how L-Tryptophan stimulates protein synthesis in the liver using L-Leucine as a positive control. In this study, rats received oral gavage of 135 mg/100g BW of L-Tryptophan or L-Leucine, and an Intraperitoneal (IP) injection of puromycin (2.18 mg/100g BW) after 30 minutes. Rats were sacrificed under isoflurane anesthesia exactly 30 mins post-puromycin injection, and liver and gastrocnemius muscle, excised and processed immediately for western blot. Protein synthesis rates in the liver and gastrocnemius muscle were measured using Surface Sensing of Translation (SUnSET) method. The phosphorylation state of ribosome protein S6 kinase beta-1 (S6K1) and eukaryotic translation initiation factor 4E binding protein (4E-BP1) were estimated by Western blot. Comparing the L-Tryptophan and L-Leucine effects on the liver and skeletal muscle protein synthesis, it was revealed that L-Tryptophan increased the rate of protein synthesis concomitant with an increase in S6K1 and 4E-BP1 phosphorylation downstream of mTORC1 in the liver but not skeletal muscle. However, in L-Leucine administered rats the rate of protein synthesis in the liver and skeletal muscle increased, respectively. This suggests that the effects of L-Tryptophan on protein synthesis maybe liver-specific, and that L-Tryptophan stimulates protein synthesis through the mTORC1 signaling pathway by phosphorylating S6K1 and 4E-BP1 translational factors.

Keywords: L-Tryptophan; SUnSET, mTORC1; S6K1; 4E-BP1, protein synthesis.

Fecal Matter Treatment via Black Soldier Fly: Process Performance Evaluation

Author: Oyoo Valary (E0125) University: Meru University of Science and Technology

BACKGROUND

Access to safe and adequate sanitation services for everyone is essential for promoting good health, environmental protection and community well. However, the provision of universal access to safe and equitable sanitation services especially in low and middle income countries remains a worldwide challenge. Circular economy approach through resource recovery can alleviate several challenges relating to fecal sludge and promote SDG 2, SDG 3, SDG 4 and SDG 6

PROBLEM STATEMENT

The need for innovative resource based technology in fecal sludge management that forms a paradigm shift of human excreta from a waste perspective to a productive resource has led to adoption of Black soldier fly technology. However, inadequate data concerning co-digestion of substrate for optimum waste conversion has led to limited uptake of BSF technology.

RESEARCH OBJECTIVES

- i. To determine the BSF waste conversion efficiency.
- ii. To investigate the performance for a fabricated BSF solar drier.
- iii. To model the optimal BSF larval growth as a factor of time.

METHOD

The study was a quantitative research method where experimental design was employed to evaluate BSF process performance. Five treatments (three replicates per treatment) were prepared with different mixing ratios of fecal to kitchen waste. Five grams of 9 day old BSF larvae were inoculated and monitored throughout the treatment for process performance.

RESULTS

This study showed that the larval performance was highly affected by the characteristics of the growing substrate provided. The larvae served effectively in waste reduction and recycling of the nutrients in form of biomass.

CONCLUSION

Circular economy innovative approach for FSM would result in reduced environmental pollution, improved sanitation and sustainable economic growth. BSFL co-digestion can be used for fecal waste management and recycling for nutrient recovery and re-integration into the food chain and bio-fertilizer production.

Supervisor: Dr. Joy Riungu

Determination of the Gross Nutrient Composition of Black Soldier Fly across the BSF Larvae Treatment Process

Author: Sibonje Jemimah Nabwile (E0127) **Institution:** Meru University of Science and Technology

BACKGROUND INFORMATION

The increase in population growth and urbanization puts immense pressure on existing sanitation infrastructures. The SDGs 6 advocates for adequate and equitable sanitation to all. However, UN, 2017 records that around 70% of the population do not have access to safe sanitation.

PROBLEM STATEMENT

Sanitation has been receiving great attention since its involvement in the Millennium Development Goals of target 10. However, many developing countries are facing challenges in the sector due to lack of treatment technologies. Onsite sanitation is the norm and is limited to containment, collection, transport and treatment. The gap on the sanitation value chain need to be filled by focusing on reuse of the sanitation derived products by using innovative technologies like BSF technology as it shifts the paradigm from linear to circular economy. Organic waste can be treated by the BSF technology which turns waste into resources, as it produces larval biomass rich in protein and fat compounds. The adaptability of the technology is limited, therefore the need to characterize the nutrient value of the black solder fly products across the treatment process.

OBJECTIVES OF THE STUDY

The main objective is to determine the gross nutrient composition of Black soldier fly across the BSFL treatment process. Specifically focusing on fat, crude protein, carbohydrate and ash content. **METHODOLOGY**

The study will be carried out at Meru University of Science and Technology. About 500g of fresh fecal and Kitchen waste as substrates will be homogenized to reduce variability. 5-day old black soldier fly larvae will be collected from the institution breeding unit and be grown on the wastes in triplicates. The sampling will be done at interval of 4 days, oven dried and grinded. Finally, the proximal analysis will be done. The collected data will be analyzed using Microsoft Excel.

SIGNIFICANCE OF THE STUDY

Fecal waste poses a threat to public health, well-being and environment sustainability. Safe fecal waste management will promote a good number of SDGs goals. This will promote SDG 1, 2, 3 and 6.

Supervisor: Dr. Joy Riungu

The Synthesis of Urban Heat Effect in Tropical Africa

Author: Gyimah Ronald Reagan (E0128) University: University of Ghana

BACKGROUND

Global warming and rapid population growth are two of the most pressing issues in today world. There is a lot of evidence to support rising temperatures. Urban heat island effect is a significant environmental issue facing today's cities. Though this issue has gained much attention in research articles from developed countries, developing countries like tropical Africa have yet to grapple with it on a significant scale. This paper examines the rising research dimensions and major techniques in studying urban heat effects.

METHODOLOGY

Scholarly publications were culled through the use of a systematic review procedure. This study looked at 37 papers in total.

RESULTS

From the findings, quantitative research approaches such as remote sensing are more commonly used to analyze the impact of urban heat than ground use technology, which has a limited application in Africa. Various urban heat effects are caused by urbanization and other human factors, and this has an impact on many elements of life, including morbidity, mortality, birth weight decrease, and social strife.

CONCLUSION

It is recommended that research into the urban heat effect in Africa should be prioritized.

Supervisor: Prof. Kwadwo Owusu

Productivity of Kale *Brassica oleracea* L. and Spinach *Spinacia oleracea* L. under Black Soldier Fly Frass Fertilizer and Various Irrigation Regimes in the Wonder Multi-Storey Garden Technology in Kenya

Author: Abiya Andrew (E0130)

University: Jomo Kenyatta University of Agriculture and Technology

BACKGROUND

The wonder multistorey garden is an innovative vertical farming system tailored for urban settings due to its assumed vertical space optimization. However, its efficiency can be constrained by irrigation regime and input quality. The present study aimed to provide qualitative data on the effects of fertilizer types and the irrigation regime for sustaining enhanced growth, development, and yield of leafy vegetables.

METHOD

The experiment consisted of Black Soldier Fly frass fertilizer at 100% and 50%, NPK inputs and a control and different irrigation regimes to produce kale and spinach under a Randomized Complete Block Design.

RESULTS

The irrigation regime had no significant effect on the number of leaves for both kales and spinach during the entire growth period. Moreover, there was no significant effect of irrigation regime on spinach height (p=0.39) but in contrast significant difference on height was recorded for kales (p<0.05). Once per day, irrigation produced the highest plant height for kales with 40.03 ± 0.28 cm significantly different as compared to other irrigation regime. Fertilizer type had no significant effect on the plant height and number of leaves of both crops. Interaction between irrigation frequency and fertilizer type had no significant effect on the number of leaves for kales (p=0.09) and spinach (p=0.37), but it had a significant effect on plant height for kales (p<0.001). The application of once per day irrigation with 100BSF fertilizer produced higher kale height (41.98±4.24 cm) than other combination. The irrigation regime and Fertilizer type had a significant effect on chlorophyll concentrations for both kales and spinach. Chlorophyll concentration was higher on kales 100BSF (42.69±0.48) more than the control and other fertilizers while for spinach, NPK produced higher chlorophyll concentration of (35.87±0.46) than other treatments. Chlorophyll concentration showed an increment with advancement in crop age and the highest average chlorophyll content was reported at 42 DAT, while the lowest average value of for kales and spinach was recorded at 28 DAT with (38.54±1.1 SPAD), (29.14±2.11 SPAD), respectively. More effect of irrigation regime and fertilizer type was observed on kale than spinach.

CONCLUSION: The study concluded that the application of once per day irrigation regime with 100BSF fertilizer gave best performance in kales production. Furthermore, 100BSF fertilizer produce taller and vigorous spinach crop with higher chlorophyll concentration.

Supervisor: Prof. John Wesonga

Therapeutic Efficacy of Coartem® (artemether-lumefantrine, AL) for the Treatment of Uncomplicated Plasmodium Falciparum Malaria in Metehara, Eastern Shewa of Ethiopia

Author: Mahelet Tesfaye (E0134) **University:** Addis Ababa University

BACKGROUND

Malaria is a disease of the most vulnerable: the very young and the poor. Globally, there were an estimated 229 million cases and 409,000 deaths of malaria in 2019 in 87 malaria-endemic countries. Effective vector control and case management are the pillars for Malaria preventive and control intervention. The case management program basically hooked on antimalarial drug efficacy study for close surveillance of the emergence and the distribution of artemisinin and partner drugs resistance to guide public health measures.

OBJECTIVE

Assessing the clinical and parasitological efficacy of the target drug and evaluation of the adverse events which in turn helps to formulate recommendations and to enable the Ministry of Health to make informed decisions about whether the current national antimalarial treatment guidelines should be updated.

METHOD

The surveillance study is a one-arm prospective evaluation of clinical and parasitological responses to directly observed treatment for uncomplicated *P. falciparum* malaria. Participants whose age is ≥ 6 months will enroll in 28 days follow-up and examine clinically and in the laboratory.

RESULTS

For patients with P. falciparum in day-28 adequate clinical and parasitological response (ACPR) with Coartem® (artemether-lumefantrine, AL) was 100% (88/88; 95% CI: 95.9- 100.0) in the perprotocol analysis and 100% in the Kaplan–Meier analysis

CONCLUSION

According to the result, Coartem® (artemether-lumefantrine, AL) is still efficacious for the treatement of uncomplicated *P. falciparum* Malaria in Metehara, Ethiopia.

Drivers of Riparian Degradation of Kuuru River, Meru County, Kenya

Author: Jason Purity Wanja (E0138)

University: Meru University of Science and Technology

BACKGROUND

River Kuuru is a tributary of river Tana and plays a significant role within Meru County as a source of water for irrigation and other domestic uses for the households that reside in the areas it passes. The river flows through densely populated area whose main activity is agriculture and livestock keeping hence, predisposed to riparian degradation. The study aims to address this gap to achieve SDG 2 and 6.

OBJECTIVE

To assess and quantify factors driving degradation of Kuuru River

METHODOLOGY

This research study employed descriptive survey design to explain the status quo of the subjects of the study. The survey involved administration of questionnaires to solicit information on the human activities practiced in the area and the stakeholders involved in the management of the Kuuru River.

RESULTS

Parameter	Description	Response rate in %
Vegetation along the riparian area	Agricultural crops	61.46%
	Bare	5.47%
Gender	male	54.95%
	female	45.05%
Farm size	1-3 acres	77.09
Type of grazing	Zero grazing	49.44%
	Tethering & open field	50.55%
Source of water for animals	Taking them to the river	34.64%
Awareness of the law that allows community participate in riparian conservation	No	54.91%
Management plan	No	69.81%
Involvement in decision making by WRUA	No	74.86%
Involvement in conservation by WRA	No	95.04%
County involvement in conservation	No	100%

Small land sizes are due to land inheritance. This has led to cultivation of riparian zone. Despite having several stakeholders, little has been done; attributed to illiteracy levels and overreliance of household to agriculture for their livelihood. Community awareness to existing legislative frameworks is minimal and institution regulators have done very little on awareness creation.

CONCLUSION

Urgent measures to conservation Kuuru River are required so as to complement agricultural activities in the area.

Supervisor: Dr. Cynthia Mugo

Forage Production Potential of Maize-Cowpea Intercropping in Maichew, Tigray, Ethiopia

Author: Abraha Negash Gebrehiwot (E0140) University: Addis Ababa University

BACKGROUND

Integration gap in livestock-crop interactions created problems facing forage development in Ethiopia acting bottleneck to livestock productivity that influenced SDG1 and 15.

STATEMENT OF THE PROBLEM

Growing of forage legumes intercropping enables to use the small farm land for both crop and feed production, offering potential for increasing fodder without reduction of grain production.

OBJECTIVES

To evaluate effect of maize and cowpea intercropping on the agronomic practice on agronomic, nutritional and economic returns of forage production.

METHODOLOGY

RCBD with three replications and five treatments (two monocultures and three mixtures of maize & cowpea) were included in the experiment with a proportion; 1C:1M for T4, 1C:2M for T5 and 2C:1M for T3 and sole crops of cowpea (T1) and maize (T2) included as check to compare yields of intercropped mixtures. The treatments included seed proportions as follows 144:0 (100% cowpea), 0:144 (100% maize), 96:48 (67% cowpea: 37% maize), 72:72 (50% cowpea: 50% maize) and 48:96 (33% cowpea: 67% maize). The land was ploughed and ridged then divided into 15 plots (3.6m x5.4m=19.44 m² each) and 1m plot spacing, in 18.2m *22m= 400.4m². For highest yields, plant maize rows 75 cm apart with in-row spacing of 30 cm. Plant cowpea in rows midway between maize rows with in-row spacing of 15 cm.

RESULTS

The effect of intercropping treatments on maize forage yield was significant (P<0.05), however, there was no significant difference in grain yield among the cropping systems though T5 yielded higher and higher 100 maize grains weight followed by T4 yield and 21.74g average 100 maize grain weight; T3 (3.05ton/ha) and 21.84g average 100 maize seeds and the least in yield was actually the sole maize T2 (2.24ton/ha), confirming that intercropping has at least, some scenario better than sole cropping practices. Nutritionally, feed quality of maize parts was significant difference among the intercropping systems that stated in their descending value of cowpea hay, as follows: NDF (T3>T1>T5>T4); ADF (T1>T5>T3>T4) and typical in CP. lignin content (T1>T5>T4>T3), while IVDMD% (T3>T4>T5>T1). NDF content was significantly higher in maize stem and least in grain. Maize husk significantly over dominated in ADF content than stem, leaf and grain in descending order. ADF content was great significant in the entire parts that maize husk has higher than stem which exceeds leaf. Grain was the least in ADF content of all maize parts. Similarly, maize stem was significantly higher in lignin than husk, leaf and grain. LER was 1.45 in the mixtures indicating yield advantage over sole crops. T4 has the potential for enhancing cowpea and maize performances.

CONCLUSION

Favourable seasons for better DM yield and chemical composition of both crops should be researched. So intercropping can enhance land productivity, nutritional value of the feed and food, boosting economy that supports SDG1 and 15.

Study on the Employment Support for Foreign Workers in Japan from the Gender Perspective Viewing

Author: Dong Shiyue (E0142) University: Utsunomiya University

BACKGROUND

In current Japan, foreign workers who come to Japan as simple labors are at a disadvantage in many ways, such as language problems, separation from their families, unstable status of residence, and acceptance of different cultures. Women foreign workers in particular are placed in an even more vulnerable position with Sexual harassment and Gender differences.

METHOD

Visit the foreigner support center and conduct interviews and questionnaires with the staff and the female foreign workers to know their difficulties and need and how the support center can help. Analysis case studies from the survey or news from the Internet and further clarify the issues through individual case study analysis.

RESULTS

The spread of the coronavirus and the imposition of a state of emergency will complicate the issue of employment for many foreign workers. Many foreign students and foreign workers on work visas work in industries that cater to inbound tourists, such as lodging, tourism, and retail stores such as duty-free stores. In addition, foreigners working in restaurants, convenience stores and supermarkets were also affected by the shortened hours and closed businesses. While women foreign workers are furthermore not provided with protection from sexual assault, pregnancy and childcare, and power harassment in the workplace.

CONCLUSION

Hope to contribute to the improvement of support centers, employment of foreigners and related support policies. So that foreign female workers can have a better working environment while maintaining their physical and mental health, and thus contribute more to economic development.

Supervisor: Prof. Tamaki Matsuo

LIST OF TEN BEST PRESENTATIONS (PRESENTERS)

- A04: Abiya Andrew (Jomo Kenyatta University of Agriculture and Technology)
- A06: Fukuhara Daisuke (Utsunomiya University)
- A09: Nakajima Kaoru (Utsunomiya University)
- A11: Weng Yuanjie (Utsunomiya University)
- A17: Mungai Sloane Wairimu (Jomo Kenyatta University of Agriculture and Technology)
- A23: Amwoma Lorraine Moindi (Meru University of Science and Technology)
- A24: Gebermedhin Getnet Kiros (Addis Ababa University)
- A26: Sato Yuki (Utsunomiya University)
- B08: Nakamura Yuta (Utsunomiya University)
- C08: Khemmarath Parinya (Utsunomiya University)

Photos of Awards and Closing Ceremony



President of Utsunomiya University



Group photo at the Closing Ceremony



Certificate (sample) awarded to all students who presented their research by video at the UU-A Student Summit 2022.

Below are screen shots of the Zoom at the Award Ceremony with the Certificates for the 10 students who were awarded the Best Presentation Award.







BRIDGING YOUNG RESEARCHERS WITH THE SDGS

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