

WORKSHOP CHAIRS

Ashlyn Anderson



Graduate Student. FEWSUS International Ambassador

Ashlyn graduated Summa Cum Laude from the University of Tennessee Knoxville with a B.A. in Food Security and Public Health Nutrition and minors in Spanish and International Agriculture. She is currently a Fulbright Scholar and English Teaching Assistant in Mexico through the US Department of State Commission for Educational and Cultural Exchange. She has recently been awarded with a Rotary International Global Grant scholarship to attend the prestigious London School of Hygiene and Tropical Medicine (LSHTM) to study a Masters in Nutrition for Global Health. She has been involved with FEWSUS for multiple years and seeks to connect students to international opportunities to promote systemic change aligned with the UN Sustainable Development Goals.

As a former Haslam Scholar and College Scholar at UTK, she developed her research interests in food insecurity and leveraging food policy and public health infrastructure to address systemic inequities. Her thesis research was a qualitative study of the lived experience of food insecurity and proposed solutions of college students at UTK, which has been published and shared at campus, state, and national conferences to inform sustainable interventions. In 2019 she was selected as a Milam Scholar to Guatemala where she facilitated community health discussions with mothers and infants, led nutrition education lessons, and constructed a school garden. Ashlyn was the President of the Student Basic Needs Coalition (SBNC), an International Ambassador for the Smith Center of International Agriculture, and Associate Member of the Knoxville-Knox County Food Policy Council. As a food justice and public health advocate working with the FEWSUS team, she aims to create an international network to develop comprehensive knowledge in global public health nutrition and become a change-maker through careers in health-oriented NGOs.

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Duncan McCurry



Graduate Student. FEWSUS International Ambassador

Duncan McCurry is completing his master's degree in environmental and soil sciences at the University of Tennessee, Knoxville. His research interests include land use changes, urbanization, and sustainable development. Duncan joined the FEWSUS project after completing his bachelor's degree in environmental science from UTK in 2019. He has conducted fieldwork in Guatemala and Panama as a graduate student. He has gained research experience working in a greenhouse study for the soil physics department exploring the impacts of biochar additions to corn plants. Additionally, he participated in competitions with the UTK soil judging team, traveling to Virginia Tech, Western Kentucky University, and California Polytechnic Institute for regional and national-level competitions. By working with the FEWSUS project at UTK, Duncan has gained a greater understanding of the complex dynamics of urban sustainability and ways that international transdisciplinary research can address modern development issues.

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Emma Navarro



Institution: Zamorano Pan-American Agricultural School

Biography: I am completing my master's degree in Sustainable Tropical Agriculture in Zamorano Agricultural School in Honduras. I am committed to contributing to the empowerment and recognition of women in agriculture. I am interested in work focused on enhancing local socio-economic development, management of natural resources, and incentives towards sustainable productive activities.

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MODERATORS

Bo Wenhao



Institution: Shenyang Agricultural University

My name is Bo Wenhao, female, an undergraduate student majoring in Agricultural Resources and Environment, College of Land and Environment, Shenyang Agricultural University. I am interested in soil-related research.

Wang Xinyue



Institution: Shenyang Agricultural University

My name is Wang Xinyue, female, master, major in Agricultural Management, College of Economics and Management, Shenyang Agricultural University.

DAY 1

Thursday, April 20th

WORKSHOP PRESENTERS' ABSTRACTS & BIOGRAPHIES



Faryal Babar Baloch



Institution: Shenyang Agricultural University

Faculty Advisor: Bingxue Li

Country: Pakistan

Title: "Assessing Pakistan's Efforts in Eliminating Hunger"

Abstract: Pakistan has implemented various measures to eliminate hunger, including the Benazir Income Support Program, agricultural productivity improvements, and nutrition education. Despite these efforts, hunger and food insecurity persist, particularly in rural areas. To assess the progress made in eliminating hunger, this examines the effectiveness of government policies, private sector initiatives, and the impact of various development programs. The study also identifies the remaining challenges and proposes recommendations to address them. Overall, the findings suggest that while significant progress has been made, sustained efforts and collaboration among all stakeholders are necessary to eradicate hunger in Pakistan.

Biography: My name is Faryal and I am a female candidate completing a Ph.D. in the College of Land and Environment at Shenyang Agricultural University. My speciality is Microbiology of Resources and Environment, and my research interest includes soil microbiology, soil fertility & plant nutrition and salinity.

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Jean Pierre Enriquez



Institution: Louisiana State University

Faculty Advisor: Elizabeth Gollub

Country: Ecuador

Title: "Understanding Food Insecurity Among College Students Minorities"

Abstract: The Importance of Food Security Among College Minority Groups Food resource distribution is critical globally making it difficult to people to meet their energy/nutrient needs. This imbalance in food distribution and hunger problems has positioned Food Insecurity (FI) as a primary public health concern. FI is not only affecting households, but also students at higher education. The situation on university campuses tends to be even more critical than it is for households. This has been shown by data where FI rates among college students were reported at levels ranging from 10–75%. The changing demographics of university students could be contributing to high rates in FI among students.

Biography: My name is Jean Pierre Enriquez and I am originally from Ecuador. I am a Ph.D. student in Human Nutrition, where I am studying several aspects of hunger and food insecurity. I am also pursuing a minor in Kinesiology with a focus on physical activity promotion. I began my doctoral studies at Louisiana State University in January 2022, and became a member of the Society for Nutrition Education and Behavior, in the student division and also in the division of Sustainable Food Systems in May 2022. Through my research experience, I've become familiar with issues of global as well as local food security, community needs, and outreach. As such, I

have become critically aware of food insecurity and its particular toll on student and minority populations. I developed a working knowledge of barriers to food security and the consequences of food insecurity faced by university students. I observed the amplification of these barriers among international and other minority students, which has informed my proposed research objectives. I have taken the lead on a scoping review of snacks and snacking among US adults. The premise is that snacking provides nutritional and social benefits that can be integrated into food access and food security enhancement efforts.

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Daisy Kemigisha



Institution: Makerere University

Faculty Advisor: Stephen Lwasa

Country: Uganda

Title: "Incentives and Disincentives for Youth Participation in Groundnut Value Chains in Tororo and Nwoya districts, Uganda"

Abstract: Groundnut is staple in Uganda and could potentially employ many youths. We set to contribute to increasing youth participation in groundnut value chains by establishing the incentives and disincentives for their participation using photovoice. Thirty youth (20-29 years) took and discussed photos on different groundnut activities from which incentives of youth participation emerged including: benefits of farmer group membership, influence of parents' occupation, and a short payback period. Disincentives included time poverty among women, poor yields, and inadequate storage and processing facilities.

Biography: Graduate Research Assistant, Photovoice for youth empowerment in Peanut value chains Uganda project, Department of Agribusiness and Natural Resource Economics, Makerere University, sponsored by Feed the Future Innovation lab for peanut (PIL). Enhancing my knowledge and skills in providing cutting-edge techniques for gathering accurate data and

conducting econometric analysis for policy formation. Furthering my studies to horn my writing and publication skills as and agricultural economist and researcher. Working with different organizations to gain more practical experience in my field. My hometown is in Sheema, Uganda.

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Zijing Li



Institution: Shenyang Agricultural University

Faculty Advisor: Bingxue Li

Country: China

Title: “Establishing a ‘Big Food View’ to Ensure Effective Food Supply”

Abstract: Food security is closely related to national transportation and people's livelihood, and ensuring national food security is an eternal issue. The World Food Program has issued a warning that as the global food crisis continues to deepen, more and more people are trapped in a state of food insecurity, and the situation is becoming increasingly severe. We are facing an unprecedented global food crisis. In this context, Wang Wei (2022) proposes to establish a "big food view" to ensure effective food supply and consolidate China's food security.

Biography: Land resource management major, sophomore student.

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Ashlyn Anderson



Institution: Fulbright Commission Scholar

Country: USA

Title: "International Educational Opportunities for postgraduate students: Experiences with SDG 2 and 4 while Living as a Fulbright Scholar in Mexico"

Abstract: This presentation will focus on my experiences being involved with FEWSUS network at the University of Tennessee Knoxville and my current position teaching English as a Fulbright Scholar in Puebla, Mexico through the US Department Bureau of Educational and Cultural Affairs. The Fulbright program supports competitively-selected American citizens including students, scholars, teachers, professionals, scientists, and artists to receive scholarships or grants to study, conduct research, teach, or exercise their talents abroad. As a Fulbright-García Robles English Teaching Assistant (ETA) in Mexico, I will discuss my experiences of living and teaching abroad, as well as insights into the selection and application process. I will also discuss additional fully-funded scholarships to pursue graduate school such as through the Rotary International Foundation as I was awarded a Global Grant Scholarship to pursue studies in Nutrition and Public Health aligned with the Rotary Areas of Focus. I will discuss how US students and international students can uniquely apply and continue their studies or research from their home country with support of these grants and scholarship opportunities.

Biography: Ashlyn graduated Summa Cum Laude from the University of Tennessee Knoxville with a B.A. in Food Security and Public Health Nutrition and minors in Spanish and International Agriculture. She is currently a Fulbright Scholar and English Teaching Assistant in Mexico through the US Department of State Commission for Educational and Cultural Exchange. She has recently been awarded with a Rotary International Global Grant scholarship to attend the prestigious London School of Hygiene and Tropical Medicine (LSHTM) to study a Masters in Nutrition for Global Health. She has been involved with FEWSUS for multiple years and seeks to connect students to international opportunities to promote systemic change aligned with the UN Sustainable Development Goals.

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Emma Navarro



Institution: Zamorano Pan-American Agricultural School

Faculty Advisor: Arie Sanders

Country: Honduras

Title: “Voice of the Women Involved in Coffee Production under Sustainable Practices”

Abstract: Coffee is an export crop, and it has been identified that export crops are mainly produced by men, leaving subsistence crop production to women. However, in Marcala, La Paz, Honduras, a group of women who are dedicated to the production and export of organic coffee was identified. Therefore, the objective of the study was to identify the identity of the women coffee grower, her challenges, and sustainable agricultural practices in her plots. The information was collected through the photovoice participatory methodology and was analyzed from the Feminist Theory of Agrifood Systems.

Biography: I am completing my master’s degree in Sustainable Tropical Agriculture in Zamorano Agricultural School in Honduras. I am committed to contributing to the empowerment and recognition of women in agriculture. I am interested in work focused on enhancing local socio-economic development, management of natural resources, and incentives towards sustainable productive activities.

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Annie Carter



Institution: University of Tennessee

Faculty Advisor: Tom Gill

Country: USA

Title: "Assessing Gender Roles in the Groundnut Value Chain in Uganda "

Biography: Annie Carter is a second-year master’s candidate studying Agricultural Leadership, Education and Communications at the University of Tennessee, Knoxville. She received her bachelor’s degree from UT Knoxville in May of 2021 in Agricultural Communications where she also worked as an undergraduate researcher with the Smith Center for International Sustainable

Agriculture. She is currently working with Smith International Center as a graduate research assistant and primarily focuses on the country of Uganda and photovoice methodological research. She will graduate in May of 2023 and hopes to continue her international work.

Abstract: As the global population grows to an estimated 9 billion by 2050, agricultural production remains the focus for how to feed the world. For both men and women, improving agricultural yields is important to those who support their households. In Oceania, South Asia and Sub-Saharan Africa, agriculture is the largest employer, with 60 percent of women working in this sector. In least developed countries (LDC's), such as Uganda, agriculture employs 80% of women in the economic workforce. Despite their high participation rate, women in Sub-Saharan Africa manage land plots that are 20-30% less productive than plots managed by men. To increase agricultural productivity, closing gender gaps can help achieve food security. Literature has previously assessed many of the gender gaps existing in agricultural markets and value chains. However, scholars question the authenticity of information published as gathering data in developing countries remains difficult. Therefore, there remains a need to assess gender roles within the groundnut value chain, due to its increasing popularity not only in Uganda, but also in Sub-Saharan Africa. The purpose of this study is to analyze gender roles within the groundnut value chain in the two districts of Nwoya and Tororo using a mixed-methods approach.

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Yunuo Zhao



Institution: Shenyang Agricultural University

Faculty Advisor: Bingxue Li

Country: China

Title: "Application of Biochar in Ecological Protection of Wetland Water"

Abstract: The wetland water ecological landscape integrate traditional water pollution control technology and ecological restoration idea, but due to its poor water flow and low self-purification capacity, it is easy to be destroyed by the polluted water source, and even aggravate the water ecological environment pollution. Biochar can fix pollutants in water by adsorption, distribution and so on, which can play a huge potential. In this report, I will introduce the source and characteristics of biochar, the mechanism of water purification efficiency of biochar-based wetland, and the action mechanism of biochar on aquatic plant growth and microbial community reproduction.

Biography: My name is Zhao Yunuo. (赵雨诺) I am currently majoring in agricultural resources and environment in Shenyang Agricultural University, College of Land and Environment. I am from Panjin, Liaoning Province. I have participated in many innovative projects and won awards. I am good at piano and singing. Last year, I also attended the international seminar. I hope I can make better use of it this time, and communicate with students more, and have the opportunity to exchange and study as visiting scholars in the future. I wish this seminar a smooth holding.

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Aldrix Velásquez



Institution: Technological University of Panama

Faculty Advisor: Félix Henríquez

Country: Panama

Title: “Factors and Indicators of Energy Poverty in Panama” (shared presentation)

Abstract: Access to energy improves the quality of life of people in rural areas and decreases energy and social inequality. Energy poverty is a problem that affects developed and developing countries, but it is more evident in the latter; it has multiple dimensions that coincide with the energy needs of human beings, which are: Lighting, food cooking, cooling, thermal comfort, and communication. It was found that some factors causing energy poverty cannot be controlled by users such as the percentage of power coverage, energy costs, quality of energy service, while others can be controlled as the quality of housing and household appliances and household income. In the case of Panama, one of the countries in Latin America where no studies on energy poverty have been conducted, a formal definition of energy poverty was proposed, as well as several measurement indicators and a multidimensional index.

Biography: My name is Aldrix Velásquez, an industrial-mechanical engineer who graduated from the Technological University of Panama (UTP). I have been working for two years as a research

assistant for a research center inside the UTP. I have assisted in energy projects where the main objectives were the integration of energy and sustainable development. Also, I wrote a bachelor's thesis about Energy Poverty in Panama and participated in a National Secretary of Science and Technology (SENACYT)-funded project about energy poverty. One of my short-term goals is to study a master's degree in energy to help my country in formulating energy policies for a more sustainable future. In my free time, I enjoy cooking and learning about different science and technology topics.

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Nicole M. Villarreal Garay



Institution: Technological University of Panama

Faculty Advisor: Félix Henríquez

Country: Panama

Title: "Factors and Indicators of Energy Poverty in Panama" (shared presentation)

Biography: My name is Nicole Villarreal, I'm 23 years old, I'm from Panama. I studied Industrial Mechanical Engineering at the Technological University of Panama (UTP). From 2022 until this year, I worked at the Center for Electrical, Mechanical and Industry Research and Innovation (CINEMI) of the UTP where we conceptualized the thesis of Factors and Indicators of Energy Poverty in Panama, which allowed us to know different energy scenarios in the country. I am currently part of the research "Design and Implementation of a Methodological Tool for the application of criteria and Indicators of Energy Poverty in Panama." I have experience working as a power plant dispatch center operator in remote locations. I am interested in continuing to expand knowledge about energy and working in this branch, which will have a great impact on all generations highlighting the effects on men and women, and also the economic factor. On the other hand, I am a volunteer in foundations related to children and women, specifically focused on education.

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FengYu Zhang



Institution: Shenyang Agricultural University

Faculty Advisor: Zhenxing Bian; Xinhao Hao

Country: China

Title: “Food Security Implications of Carbon Accounting for Food Life Cycle”

Abstract: At the seventy-fifth session of the United Nations General Assembly, General Secretary Xi said: "China will increase the country's independent contribution, adopt more powerful policies and measures, strive to reach a peak of carbon dioxide emissions by 2030, and strive to achieve carbon neutrality by 2060."Based on this, we conduct research on carbon emissions.

Biography: My name is Zhang Fengyu, from Tieling, Liaoning Province, China. I am sophomore student at the College of land and Environmental at Shenyang Agricultural University with a major in Engineering. I am involved in many university college wide initiatives as league branch secretary in my class. My hobbies are swimming, running, singing and dancing.

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Francely Flores



Institution: Zamorano Pan-American Agricultural School

Faculty Advisor: Carolina Avellaneda Barbosa

Country: Honduras

Title: “Phenotypic Characterization of Tomato Accessions for Sustainable Agricultural Production”

Abstract: The conservation and sustainable use of plant genetic resources are crucial for achieving sustainable development goals related to food security, water scarcity, and climate change. In this study, we aimed to identify tomato accessions with desirable traits for sustainable agricultural production in Honduras. We carried out phenotypic characterization of ten tomato accessions from the World Vegetable Center's germplasm bank and two commercial hybrid checks under climatic conditions in Honduras. Our results showed that lines AVTO1903 and AVTO1915 possessed desirable characteristics for sustainable production, suggesting their potential use in breeding programs. This research contributes to the sustainable use of tomato genetic resources and supports SDGs 2, 6, and 12 through sustainable agriculture.

Biography: I completed my master's degree student at the Sustainable Tropical Agriculture Center at Zamorano University. I am currently conducting an internship at the World Vegetable Center in Taiwan.

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Ruth Martha Mirembe



Institution: Makerere University

Faculty Advisor: Prof. Archileo Kaaya

Country: Uganda

Title: “Using Photovoice to Analyze Factors that Influence Peanut Product Quality and Safety along the Value Chain in Uganda”

Abstract: This study aimed at using photovoice to evaluate on-farm and postharvest handling practices influencing quality and safety of peanuts in Uganda. Thirty rural-youth in Nwoya and Tororo districts were trained in photovoice and given smartphones to take photos of what they understood by peanut quality and safety. Data obtained was analyzed using Atlas-ti-version-6. Findings indicated five themes; agronomic practices, pest-and-disease management, storage, processing and marketing. Photovoice addressed the risk factors that exposed peanuts to adverse contamination levels which can be prevented and controlled. Furthermore, peanut quality and safety burden in Uganda is still high and requires urgent and appropriate interventions.

Biography: I am a Food Science graduate from Makerere University in Uganda. My research focused on using photovoice for participatory assessment of peanut quality and safety along the value chain. I am seeking to be a Food Professional in a world-class organization where I can utilize my knowledge and skills in improving the Food industry of Uganda and then to the world. I am energetic and passionate about learning about the latest advancements in the Food industry for better equipment and future excellence.

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Sally Reed



Institution: University of Tennessee

Faculty Advisor:

Country: USA

Title: “Family Farm Operations: The Most Valuable Player in Counteracting Climate Change”

Abstract: The pressure to create a better world/environment for the future, while increasing the production of food. With the growing hunger crisis, the goal has been present for decades; however, the current societal push is causing consumers to demand farming practices to be re-evaluated. Family farming operations currently use the majority of farmland and aid in the production of food worldwide; however, the focus of food production has been focused on large industrial operations. Regenerative agricultural practices have the potential to counteract the neglect small farming operations receive, while meeting the goals of creating more food and a better future.

Biography: I am Sally Reed, a current 1st year master’s student at the University of Tennessee pursuing studies in Plant Science with a specialization in Crops. Prior to beginning graduate school, I earned a bachelor’s degree in Crop Science: Plant Protection from the University of Illinois. I am excited at the perspective to pursue a career in the crop industry, specifically, agronomic production with the goal of working alongside growers to implement farming practices that can increase food production and economic benefits. When I am not visiting my home in Jerseyville, IL, I enjoy spending time with friends, hiking, cooking, and exploring different areas of the country.

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Andrea Salazar-Bonilla



Institution: Zamorano Pan-American Agricultural School

Country: El Salvador

Title: “Challenges and Opportunities of Climate Change in the Central American Region, Moving Towards Green and Resilient Production”

Abstract: The Central American region faces a number of climate challenges, being a region where the main source of income comes from agriculture, these are under considerable risk as production chains are greatly affected by climate variability, working together for low-carbon production and climate-smart agricultural production could increase the region's resilience over time, because of this the region seeks to strengthen the joint work between the environmental and agricultural sector in order to work according to the priorities identified and generate a benefit for both parties.

Biography: Andrea Salazar-Bonilla, Salvadoran graduate from the Zamorano Pan-American Agricultural School, Engineer in Environment and Development with experience in regional technical assistance in Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, and Dominican Republic, in the sectors of agriculture, forestry and other land uses, water resources, climate change, desertification and drought, forests and landscapes, environmental quality, renewable energy and solid waste. Oriented to the management of environmental projects focused on climate change, climate-smart agriculture, environmental and sustainable management of natural resources in production chains. My goals are to help my country and the Central American region to strengthen the enabling capacities to face the challenges of climate change. One of my favorite hobbies is hiking, as it allows me to disconnect from my daily routine and connect with the peace of the tropical nature of my country.

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Eliza Bettis; Sydney Ivory; Gracie Jones; Sophie Roark



Institution: University of Tennessee

Faculty Advisor: Adam Willcox

Country: USA

Title: “Study Abroad Programming for Sustainable Urban and Peri-Urban Tourism”

Abstract: Tourism and global travel rates are steadily increasing, and countries worldwide reap consequences from the absence of sustainable tourism practices. Most countries rely on steady rates of tourism, however, mass tourism industries can generate negative factors on urban and peri-urban environment. With COVID-19 travel restrictions lifted, universities are expecting high numbers of students travelling abroad. As a part of our experience abroad, we will be conducting preliminary research on sustainable tourism practices by collecting data from hands-on research. From our data collection, we want to adopt sustainable travel techniques that could be used to educate others traveling abroad and bring attention to the negative impacts of non-sustainable tourism. Higher academic institutions committed to SDG’s goal should consider developing well defined study abroad guidelines for travel that meet UN World Tourism Organizations (UNWTO) standards.

Biography: We are a group of students from the Academy for Global Scholars (AGS) at the University of Tennessee. AGS is a program for first-year students that provide our cohort with a unique opportunity for global engagement and individual growth. As a student group we are committed to SDGs in the United States and abroad. VOLS commit to sustainable travel!!

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Day 2. Friday, April 21st



Logan Pederson



Institution: University of Tennessee

Faculty Advisor: Jie Zhuang

Country: USA

Title: “A Food-Energy-Water Nexus Approach to Removing Perfluoroalkyl Substances (PFAS) from Contaminated Biosolids”

Abstract: Perfluoroalkyl substances (PFAS) are a group of man-made, toxic chemicals that emerged in the mid-twentieth century, and their presence in sewage sludge and other biosolids restrict the application of these valuable resources in agronomical systems. The strong carbon-fluorine bonds that exists within their molecular framework allows them to persist in the environment indefinitely on human timescales, and thus have been monikered as “forever chemicals.” However, studies suggest PFAS can be removed from biosolids through traditional methods of valorization, such as pyrolysis, and the resulting products (biochar) can be safely amended to soils as a means of enhancing agricultural productivity.

Biography: Logan Pederson is a graduate student and former analytical chemist at the University of Tennessee, Knoxville. He is currently pursuing his master's degree in environmental and soil science, with an emphasis in soil and water chemistry. While originally from Chicago, Illinois, Logan has lived in the Knoxville region for over 25 years. His professional goals include earning a PhD and pursuing a career in areas related to research and development. More specifically, Logan would like to work on emerging environmental issues associated with per and polyfluoroalkyl substances (PFAS) and the factors that influence their retention in soil. Logan would also like to partner with institutions who are developing technologies designed to resolve issues caused by PFAS in promotion of a more sustainable future.

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Xiadong Zhang



Institution: Hubei University

Faculty Advisor: Aitao Li

Country: China

Title: “Rational Design and Molecular Regulation Mechanism Analysis of Novel Steroid Hydroxylase CYP109B4”

Abstract: Steroids are a top-selling product in the pharmaceutical industry, second only to antibiotics. Cytochrome P450 monooxygenases (CYPs) play a crucial role in steroid hydroxylation, with three potential "hot spot" amino acid sites identified in CYP109B4 for selective regulation. Using mutational landscape design, focused rational iterative site-directed mutagenesis (FRISM), and iterative saturation mutagenesis, mutant B4-M7 was created to transition from region selectivity of hydroxylated steroidal from 16 β to 15 β . Computational analysis confirmed the important role of the "hot spot" amino acid sites in selectivity control, with scaffold sampling directed evolution of CYP109B members demonstrating the molecular mechanism for catalytic selectivity.

Biography: Xiaodong Zhang, is currently working toward the Ph.D. degree in biology by Professor Aitao Li with the School of Life Sciences, Hubei University, Wu Han, China. His main research interest is the directed evolution of P450 monooxygenase, and he has published 3 articles as the first author in the journal *ACS catalysis*, *Bioresource and Bioprocessing* and *Frontiers in Chemistry*.

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Yi Chang



Institution: Shenyang Agricultural University

Faculty Advisor: Fan Ding

Country: China

Title: “A Stoichiometric Approach Indicates Greater Plant Versus Microbial Inputs to Mineral-Associated Organic Matter”

Abstract: Mineral-associated soil organic matter (MAOM) is the largest, slow-cycling pool of carbon in the surficial terrestrial biosphere. Understanding plant and microbial inputs to the mineral soil will inform efforts to manage and model MAOM responses to environmental change. Here, we synthesize 274 datasets of C/N ratios and use a stoichiometric approach to estimate the proportional contribution of plant versus microbial inputs to the MAOM pool. Averaged across different climates, ecosystems, we estimate that microbial inputs contribute ~34% of the MAOM pool, whereas plants contributed ~66%. Our results challenge existing theory that microbial contributions to MAOM are greater than for plants.

Biography: I am a student in Soil Science with focus on carbon cycling at Shenyang Agricultural University. My hometown in Fangcheng County, Nanyang City, Henan Province in China. My personal and career goal is to conduct more in-depth research in the field of soil organic matter

formation and stability, and make contributions to the field of increasing soil carbon storage and mitigating climate change. My hobbies are playing basketball and singing.

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Zhongwei Zhang



Institution: Hubei University

Faculty Advisor: Aitao Li

Country: China

Title: "Transforming Inert Cycloalkanes into α,ω -Diamines by Designed Enzymatic Cascade Catalysis"

Abstract: Aliphatic α,ω -diamines (DAs) are important monomer precursors that are industrially produced by energy-intensive, multistage chemical reactions that are harmful to the environment. Therefore, the development of sustainable green DA synthetic routes is highly desired. Herein, we report an efficient one-pot in vivo biocatalytic cascade for the transformation of cycloalkanes into DAs with the aid of advanced techniques, including the RetroBioCat tool for biocatalytic route design, enzyme mining for finding appropriate enzymes and microbial consortia construction for efficient pathway assembly. As a result, DAs were successfully produced by the designed microbial consortia-based biocatalytic system. In particular, the highest biosynthesis productivity record of 1,6-hexanediamine was achieved when using either cyclohexanol or cyclohexane as a substrate. Thus, the developed biocatalytic process provides a promising alternative to the dominant industrial process for manufacturing DAs.

Biography: Zhongwei Zhang, a doctoral student at the School of Life Sciences, Hubei University, supervised by Professor Li Aitao, the main research direction is enzyme modification and the creation of new pathways for chemical biosynthesis, published 3 SCI papers on Angew. Chem. Int. Ed., Green Chem. as the first author or co-first author. Received the National

Scholarship for Postgraduates in 2020, the 5th Xinhua Yang Scholarship of Hubei University, etc.

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Dongsheng Yu



Institution: Shenyang Agricultural University

Faculty Advisor: Xinyzue Bi

Country: China

Title: “The Three Changes of Black Soil and Food Security”

Abstract: Black soil protection is crucial for the development of sustainable agriculture. Effectively solving the three transformations of black soil (thinning, nutrient loss, and hardening) is the core of protecting black soil. We will analyze the causes of black soil degradation, including soil erosion, human activities, excessive cultivation, and unreasonable fertilization, and propose measures to improve black soil, such as vegetation restoration, soil and water conservation projects, organic fertilizers, and crop rotation systems. Moreover, we will discuss agricultural pollution and food supply issues. We will explore the impact of chemical substances such as fertilizers and pesticides on black soil and discuss how to reduce pollution through green agriculture and reduced fertilization. At the same time, we will also focus on the impact of black soil degradation on food production and supply and explore ways to ensure food security while protecting black soil. Through discussions in these areas, we aim to propose effective strategies for black soil protection to achieve sustainable agricultural development.

Biography: Land resource management major, sophomore student

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Nan Zeng



Institution: Shenyang Agricultural University

Faculty Advisor: Ning Zhang

Country: China

Title: “Regulation of Cell Differentiation to Promote Pullulan Synthesis in Aureobasidium Pullulans”

Abstract: Pullulan is a polymer produced by Aureobasidium spp. The yield of pullulan production can be impacted by the cellular differentiation of Aureobasidium spp., which changes with alterations in the growth environment. To improve pullulan yield, identifying key factors that regulate cellular differentiation is crucial. Our results showed that citric acid (CA) can regulate the cellular differentiation of Aureobasidium pullulans NG by accumulating higher levels of CA in the cells to maintain growth in swollen cells (SC) form and increase pullulan production. The results suggest that controlling cellular differentiation using CA is a promising approach for enhancing pullulan production in Aureobasidium pullulans.

Biography: Microbiology graduate student. Research Interest: The synthesis of functional metabolites of fungi (Aureobasidium pullulans) and the biology of adversity. My hometown is Ankang, Shaanxi Province, China, a city with beautiful mountains and a environment.

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Jian Song



Institution: University of Tennessee

Faculty Advisor: John Schwartz

Country: USA/China

Title: “An Insight into Spatial Food-Energy-Water Nexus”

Abstract: China has witnessed rapid industrialization and significant economic growth in the past forty years. The development boosts labor appetite and leads to great human migration from inland area to costal area. The demand of food, energy, and water was significantly increased by the mechanical growth of population in the developed area and relies more on the domestic and international trade flow. A framework is proposed to address the domestically spatial flow of population, food, water, and energy. The modeled flows in 2005 and 2020 are compared, and implications for future supply chain and industry distribution are discussed.

Biography: I am currently a PHD candidate at the University of Tennessee. I have a master’s degree from China Agricultural University. I am now focusing on impact of land use change on watershed hydrology. <https://github.com/SongJim624>

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Angie Flores



Institution: Technological University of Panama

Faculty Advisor: Dra. Denise Delvalle Borrero

Country: Panama

Title: “Inventories of Marine Litter in the Community of Veracruz for the Protection of the Ecosystem and Human Health” *shared presentation

Abstract This poster describes the results of the six first monthly inventory of marine litter carried out on a beach in the community of Veracruz, West Panama. The objective is to collect data on marine litter and then present it in the form of a report to the Community Board and its leaders. Science-based reports allow the community to request solutions from the relevant authorities. Decisions are based on indicators such as concentration that describe the magnitude of marine litter pollution in the area. The methodology consists of taking a series of random macro-garbage subsamples in a segment of the beach. The inventory must be repeated monthly to find a trend in the behavior of both the beach and its visitors and users. In our case, the project runs from May 2022 to April 2023. The samples taken are counted and classified and the data generated is collected in an Excel database. The analysis of our first results indicates that part of the marine litter is generated in the area due to inadequate garbage disposal by beach visitors and residents, and another part of the debris comes from the sea. As initial conclusions we mention that marine litter affects the economic capacity of the community by reducing the tourist attraction of its beaches and that possibly its accumulation and consequent degradation will affect the ecosystem and the health of the inhabitants.

Biography My name is Angie Flores, I’m 22 years old and I’m from Panama. I study Electromechanical Engineering in the Technological University of Panama (UTP). From November 2022 until now, I have been working (as a research assistant) at the Microplastics Laboratory that is part of the Hydraulic and Hydrotechnical Research Center (CIHH) of the UTP.

I have participated in projects to collect samples of microplastics on beaches, where the main objectives were to obtain data that would show us the impact of the improper disposal of anthropogenic waste on the environment, human health, and the economy. In my free time, I enjoy walking.

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Anthony Guardia



Institution: Technological University of Panama

Faculty Advisor: Dra. Denise Delvalle Borrero

Country: Panama

Title: “Inventories of Marine Litter in the Community of Veracruz for the Protection of the Ecosystem and Human Health” *shared presentation

Biography My name is Anthony Guardia, I am 22 years old, I am from Panama. I am a student of Environmental Engineering at the Technological University of Panama (UTP). I am currently an assistant in the microplastics laboratory that belongs to the Hydraulic and Hydrotechnical Research Center (CIHH) of the UTP where we carry out studies of these plastic particles in order to understand their source, distribution, classification and possible solutions aimed at reducing or eradication of these. We are currently carrying out inventories of marine litter on different beaches in Panama in order to evaluate the microplastics present on these beaches.

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Zhijing Wu



Institution: Shenyang Agricultural University

Faculty Advisor: Mingda Liu

Country: China

Title: “How to Make Fish in Tomato Sauce - A New Mode of Urban-Rural Integration”

Abstract: The acceleration of urbanization and the refinement of the division of labor in production lead to metabolic rift between urban and rural areas. Taking China as an example, through the construction of “Food waste and industrial waste gas-Biological treatment-Feed/Fertilizer-Food production” model on the basis of facility agriculture’s development, it can produce 401.87 million tons of food, sequester 36.34 million tons of carbon dioxide, replace 40.77 million tons of soybean meal and save 39.2 million ha of arable land. This model promotes urban-rural integration, in line with SDG11 and SDG12.

Biography: Hello, my name is Zhijing Wu and my English name is Candice. I graduated from Economics School of Anhui University in 2019. For now, I am studying in the School of Land and Environment, Shenyang Agricultural University for master’s degree. My major is Environmental Engineering. My adviser is professor Mingda Liu who has years of research in Agricultural Environment and Soil Chemistry. Shenyang is my hometown, it’s a beautiful ecological city with lots of green space. After times of investigation in the countryside, our group found that there are still some environmental problems to be solved. I’ve participated in writing Life Cycle Assessment report for an energy company. I enjoy writing and reading which helps me cultivating a positive living attitude. I have always dreamed of improving and promoting advanced agricultural production technologies. Hope the world gets better and better!

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Delanie Livengood



Institution: University of Tennessee

Faculty Advisor: Jie Zhuang

Country: USA

Title: “Water Crisis in Western United States”

Abstract: The water crisis in the Western United States is a very complex issue. It is at its heart a food, water, and energy nexus problem. From the crops grown with the water, the individuals who drink water, and the energy created in dams along the river, there are many people vying for the water. We will need to look at strategies of the past and new types of policy to have the most meaningful impact on the water status in the west. The current way of life of people in the Southwestern United States is unsustainable.

Biography: My name is Delanie Livengood. I am from Columbia, Tennessee, United States. I am a senior in biosystems engineering in the Herbert College of Agriculture at the University of Tennessee, Knoxville, and I am getting a minor in soil science. I plan to move to Denver, Colorado, United States, after graduation to pursue a career in hydrology or some other biosystems engineering field. I enjoy crocheting and read quite a lot.

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Morgan Isaacs



Institution: University of Tennessee

Faculty Advisor: Jie Zhuang

Country: USA

Title: “Innovating Chinampas: Land Use Change in a Deglobalizing World”

Abstract: With water, food, and energy shortages, Food-Energy-and Water Nexus is becoming an increasingly more prevalent topic in modern society. As the world begins to deglobalize, innovative methods of producing food for a growing population is more important than ever for individual countries. An ancient Aztec agricultural method called Chinampas is considered to be the most productive agricultural design in the world and requires no additional watering. It could play an important role in the food, water, and energy nexus. With some innovative measures, this method of agriculture could be adopted and would serve as a way to provide food locally.

Biography: My name is Morgan Isaacs, and I received my bachelor’s degree in environmental and soil science from the University of Tennessee, Knoxville. I am a first-year graduate student studying the effects of agricultural systems on microbial activity. I have lived in Knoxville, Tennessee for over a decade. I hope to work in Environmental Policy or Environmental consulting after I graduate with my master’s degree. I am a member of Phi Kappa Phi and Gamma Sigma Delta honor societies, and I was nominated to be a 2022-2023 Volunteer of Distinction by the University of Tennessee, Knoxville. In my free time, I enjoy practicing Brazilian jiu jitsu and I was classically trained in guitar for 12 years.

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Anjum Jamil



Institution: Shenyang Agricultural University

Faculty Advisor: Zeliang Chen

Country: China

Title: “Tick Borne Diseases and Recent Advancement in Disease Diagnosis of Tularemia”

Abstract: Tularemia zoonotic disease that effects both man and animals drastically and putting threats on normal economy of the world, lot of outbreaks have been occurred in various countries. This presentation will cover the effects of zoonotic diseases on urban economies.

Biography: Ph.D. student in veterinary medicine area with research interest in ticksborne diseases and zoonotic pathogens.

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Yuang Cai



Institution: Shenyang Agricultural University

Faculty Advisor: Mingda Liu

Country: China

Title: "Livestock Manure and Alternative Fertilization: Key to Sustainable Urban-Rural Development"

Abstract: China's booming livestock industry faces environmental challenges due to increased animal waste. In Kangping County, Shenyang City, Liaoning Province, livestock manure was intensively treated and made into organic fertilizer which greatly improved the efficiency of livestock manure treatment compared with decentralized treatment. Using the life cycle assessment method, it was calculated that the produced organic fertilizer could reduce 13112.36t CO₂-eq greenhouse gas emissions by replacing chemical fertilizer for field return. This intensive livestock manure treatment model can help the harmless treatment and resource utilization of urban waste, mitigate climate change, strengthen urban-rural economic linkages, and achieve SDG11 goals!

Biography: I am Cai Yuang, a master student in Shenyang Agricultural University. My major is environmental engineering. I come from Huaiyuan County, Bengbu City, Anhui Province, which is a beautiful city.

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Ru tao Gai



Institution: Shenyang Agricultural University

Faculty Advisor: Bingzue Li

Country: China

Title: "The Linkage between Food-Energy-Water and Sustainable Development"

Abstract: We live in an era where energy systems, water systems and food systems are interconnected. Water, energy, and food are indispensable resources in production and life. They are closely linked and mutually restricted, affecting people's production life and ecological environment but their spatial distribution is not harmonious. Our goal is to achieve collaborative optimization and win-win results in grain production, energy development, and water resource allocation throughout the entire watershed, and to jointly achieve sustainable development goals in rural and urban areas.

Biography: My name is Ru tao Gai, a freshman majoring in Agricultural Resources and Environment in College of Land and Environment of Shenyang Agricultural University. I will actively face future challenges and continuously strive to improve my abilities.

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