



MISSISSIPPI STATE
UNIVERSITY™

INTERNATIONAL INSTITUTE

2016 INTERNATIONAL WORKING GROUPS



Global Education • Worldwide Collaborations

INTERNATIONAL RESEARCH DEVELOPMENT

The International Research Development office works with Mississippi State University (MSU) faculty in all fields of study to facilitate the development of new international interdisciplinary research and outreach projects and provides administrative support for ongoing efforts. The unit serves as the university repository of knowledge regarding international funding programs and opportunities and maintains contacts with program officers and officials at international funding agencies and collaborating institutions. The unit also provides seed funding for research and outreach collaborations through the International Working Group (IWG) grant program and actively promotes and advocates IWG projects. Engaging in such research and outreach activities and maintaining relationships abroad helps expand MSU's international reputation.

ABOUT INTERNATIONAL WORKING GROUPS

In 2016, the International Institute awarded 10 faculty grants as part of its annual International Working Group program. Successful proposals coincided with MSU's strategic research focus areas including environmental sustainability, food safety and health, and international development. Awards ranged from \$2,500 to \$4,000 and are designed to stimulate international interdisciplinary research and outreach and to catalyze MSU's partnerships with universities and other organizations across the globe.

DIRECTOR OF INTERNATIONAL RESEARCH DEVELOPMENT

With more than 20 years of experience in research administration and financial management of funded projects, Shauncey Hill directs international research development for the International Institute. She assists MSU researchers and collaborating scientists with the development of their research activities and with their proposal submission to U.S. and international funding agencies and programs.

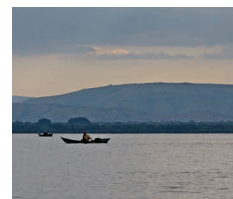


Shauncey Hill



INTERNATIONAL WORKING GROUP PROJECTS

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FUNDING INITIATIVE FOR STRENGTHENING AQUACULTURE AND FISH HEALTH (FISH) IN EAST AFRICA

MSU Faculty Experts

Dr. Mark Lawrence
Microbiology and fish health

Dr. Peter Allen
Fish physiology and aquaculture

Dr. Margaret Khaitisa
Food safety and epidemiology

Partners

Dr. Edward Okori
The Food and Agricultural Organization (FAO), Uganda Country Office
Food safety and security leadership

Dr. David Kahwa
Makerere University, Kampala, Uganda
Wildlife, aquatic animal resources, and biosecurity

Dr. Justus Rutaisire
National Agricultural Research Organisation (NARO)
Fisheries, aquaculture, NARO administration

A need for strengthening aquaculture, fisheries management, and aquatic biosecurity in the Lake Victoria Watershed arises in the wake of increased aquaculture and emerging commercial fish farmers in Uganda. With improved market prices for fish, government intervention for increased production and stagnating supply from capture fisheries, aquaculture has begun to attract entrepreneurial farmers seeking to exploit the business opportunity provided by the prevailing demand for fish in the country. The Food and Agricultural Organization, Uganda, is currently assisting several farmers in Eastern and Northern Uganda to build the infrastructure for beginning aquaculture production. With increased production, fish health issues will be inevitable. It is therefore imperative that aquatic biosecurity is incorporated in the current infrastructure taking place in Uganda. MSU's goal is to provide training and research opportunities for scientists and students, both in-country and in the U.S.



IMPROVING THE FISH DRYING PROCESS AT THE LAKE MBURO FISHING COMMUNITY

MSU Faculty Experts

Dr. Craig Capano
Construction management

Dr. Hart Bailey
Food safety

Dr. Margaret Khaitisa
Food safety and epidemiology

Partner

Dr. Celsus Sente
Makerere University, Kampala, Uganda
Molecular biology and diagnostic pathology

The fish landing at Uganda's Lake Mburo National Park is a vibrant and important site for local markets. The landing supports fish export to refineries and foreign markets. An improved, cleaner and refined process of drying fish just by adopting a new surface would greatly impact the fishermen, local people and economy, and also increase exports for the area. Construction of a clean fish drying surface will provide a sanitary and efficient fish drying process enabling wholesome and safer fish to be sold to modern fish processing plants. This would expand the market for the fishermen and improve their income. This fish drying surface would also serve as a demonstration site for best practices in fish processing to other locations in Uganda and East Africa. It will contribute to improved food safety and security.

ADDITIVE MANUFACTURING WITH BAMBOO

MSU Faculty Experts

Dr. Lei Chen
Microstructure design, micromechanics,
and fracture modeling

Dr. Jilei Zhang
Furniture engineering, natural fiber composite,
synthesis of carbon nanomaterials

Dr. William Riehm
Interior design

Dr. Mojgan Nejad
Lignin-based bioproduct, wood coating,
and adhesives

Partners

Dr. Qisheng Zhang
Nanjing Forestry University, Jiangsu, China
Mechanical properties of composites and products

Dr. Jue Wu
Zhejiang Sci-tech University, Zhejiang, China
Mechanical properties of composites and products

Bamboo fiber (BF) composites and products have widely been used for industrial applications as diverse as textiles, paper, furniture and building construction, benefiting from its entirely biodegradable and renewable nature. However, BF composites and products still suffer from the poor mechanical properties due to the high moisture absorption of bamboo fibers. The limited color and surface texture in current matrix materials also have remarkably impeded the advance of the BF composites in practice specified appearance requirements. Additive manufacturing (AM) offers unparalleled flexibility in achieving controlled composition, geometric shape, function, and complexity over traditional manufacturing methods, while keeping the relative low waste ratio and short fabrication period. The purpose of the working group is to go beyond the existing limits of the AM technology to achieve the desirable and customized functionality and performance of BF composites and products. Results from the research activities will be transferred to the furniture manufacturing companies that impact Mississippi's industrial economy.



HEALTH AND WELL-BEING IN AUTISM

MSU Faculty Experts

Dr. Chih-Chia Chen
Exercise neuroscience in special populations

Dr. Zhujun Pan
Exercise intervention for special populations

Dr. Daniel L. Gadke
Autism spectrum disorders

Dr. Lori Elmore-Staton
Human development and family studies

Partner

Dr. Chien-Yu Pan
National Kaohsiung Normal University, Kaohsiung, Taiwan
Adapted physical education

Autism Spectrum Disorder (ASD) is a developmental disability characterized by social deficits and restrictive and repetitive behaviors. As a result, ASD may present with motor and behavioral challenges, which could possibly be related to how individuals with ASD process information. To date, a large body of studies have been interested in behavioral outcomes associated with ASD; however, studies directly investigating the pattern of information processing at the neural level are rare. This project aims to directly measure brain activity to associate the cognitive, motor, and social function of individuals with ASD in cortical and behavioral levels.

SOCIOECONOMIC IMPACTS OF AQUACULTURE FISH DISEASE IN AFRICA

MSU Faculty Experts

Dr. Matthew Freeman
Fishery economics and management

Dr. Mark Lawrence
Microbiology and fish health

Dr. Kathleen Ragsdale
Applied anthropology and socioeconomics

Dr. Lurleen Walters
International trade and economic development

Partner

Dr. Melba Reantaso
Food and Agriculture Organization (FAO)
Socioeconomic study in Zambia and Zimbabwe

A variety of diseases affect aquaculture production, which can lead to revenue reduction as well as incurred health costs to producers that handle diseased fish. In African countries, seafood also serves as an important diet source of protein, so disease management also impacts consumers of these products. While management strategies are available to producers to reduce these impacts, a convincing case that the benefits outweigh the costs of implementation must be made to producers. This working group will build upon an existing relationship with Food and Agriculture Organization of the United Nations (FAO) to assist with methodology selection and to conduct a socioeconomic assessment baseline study of the impacts of Epizootic ulcerative syndrome, which is a type of fungal infection, affecting aquaculture production in Zambia and Zimbabwe.

NEGLECTED TROPICAL DISEASES (NTDs) IN UGANDA: IMPACT ON FOOD SECURITY AND PUBLIC HEALTH

MSU Faculty Experts

Dr. Margaret Khaitsa
Food safety and epidemiology

Dr. Thu Dinh
Meat quality and safety

Partners

Dr. Sylvia Angubua Baluka
Makerere University, Kampala, Uganda
Food safety

Dr. Edward Okori
Food and Agriculture Organization (FAO), Uganda
Food safety and security leadership

Dr. Thomas Graham
Makerere University, Kampala, Uganda,
Veterinarians without Borders, California, U.S.A.
Neglected tropical diseases

Neglected tropical diseases (NTDs) blight the lives of a billion poor people globally. NTDs are a group of diseases caused by parasitic worms, protozoa, or bacteria often affecting the world's poorest people living in remote and rural areas of low income countries in sub-Saharan Africa and South America. These diseases cause lifelong disability, disfigurement, reduced economic productivity, and social stigma. NTDs significantly impact food safety, food security, and public health. The prevalence of cystic echinococcosis is higher in rural communities of developing countries due to close proximity between man, dogs, and intermediate hosts species. In Uganda, Karamojong are a pastoralist community who keep large numbers of sheep, goats, and cattle and smaller populations of donkeys and camels. There is a very close association between dogs and the herdsmen who interact with them and then consume food with unclean hands. Few studies have been conducted to address the challenge posed by NTDs. This study assesses the impact of NTDs on food security and public health in Uganda.





COMPARATIVE ANALYSIS OF WATERSHED MANAGEMENT PLANNING AND PROCESSES

MSU Faculty Experts

Dr. Timothy J. Schauwecker
Restoration ecology

Dr. Joby Czarnecki
Agronomy

Dr. John Ramirez-Avila
Environmental and water resources engineering

Partners

Dr. Filippo Gravagno
University of Catania, Sicily, Italy
Methods of watershed management

Dr. Giusy Pappalardo
University of Catania, Sicily, Italy
Research and policy development in the Simeto Watershed

Successful water resource management is predicated on stakeholder involvement. Stakeholder engagement has been identified as crucial to the success of watershed management programs in Mississippi and Catania, Italy. The Red Bud-Catalpa Creek watershed project in Mississippi is in its infancy and MSU researchers will compare and contrast the experience of watershed management between Mississippi and Italy. The Simeto River watershed project in Catania provides an example of a project with similar beginnings (albeit with different drivers) and to date shows more experience in dealing with stakeholder engagement. Through collaborative research and a comparison of methods in differing environmental, political, and economic conditions, Mississippi can improve the means by which stakeholders are engaged in the planning process along with techniques that are used to gather and disseminate data; the methods used in the field to accomplish the water quality; and, habitat restoration goals that are unique to each individual watershed.

SOCIAL CAPITAL IN SOUTH AFRICA

MSU Faculty Experts

Dr. Margaret Ralston
Social demography

Dr. Leslie Hossfeld
Rural economic development and sociology,
food insecurity, and food systems

Dr. Stacy Haynes
Criminal justice policy

Dr. Lindsey Peterson
Stratification and political sociology

Dr. Somya Mohanty
Computer science and learning engineering

Dr. Gina Mendez
Comparative public policy and food policy

Partners

Dr. Timothy Brophy
National Income Dynamics Study (NIDS)
University of Cape Town, Rondebosch, South Africa

Dr. Naledi Pandor
South African Minister of Science and Technology
Government of South Africa

Dr. Dirk Strydom
Head of Agricultural Economics
University of the Free State, Bloemfontein, South Africa

The social, political, and economic climate of South Africa makes it an ideal place to do research on health, justice, food security, and social movements to bring people together who have a variety of social science research interests of “social capital” in South Africa. The big picture questions social capital, legitimacy, and efficacy of people and institutions. Data will be utilized for studies of health, food security, victimization, and justice. Interviews with people of the born-free generation and the older generation of South Africans will expand on competing ideas about the priorities for the countries. A larger goal is to develop a comparative approach to examining root causes of health and food security issues in South Africa and Mississippi.

BIOMIMICRY OF THE BOMBARDIER BEETLE'S PYGIDIAL GLAND

MSU Faculty Experts

Dr. Raj Prabhu
Thermodynamics-based constitutive models,
bio-inspired materials

Dr. Mark Horstemeyer
Integrated computational materials engineering

Dr. Fred Musser
Entomology expert

Dr. Lakiesha Williams
Biological systems for biomimicry

Dr. Jun Liao
Biological systems for biomimicry

Partner

Prof. Andy McIntosh
University of Leeds, Leeds, U.K.
Thermodynamics of biological systems

Nature often has the most optimum engineered systems that offer diverse process-structure-property functionality. The research effort aims at quantifying the chemical reactions and the structure-property-function relationships of the Bombardier beetle's engineering system for producing H₂O₂. Copying such bio-system as the Bombardier beetle's pygidial gland is of great interest to the design and development of innovative H₂O₂ manufacturing. The translational of such natural marvels to man-made production of H₂O₂ is stifled at present by a lack of understanding of the process-structure-property-function relationships of the whole process. Current studies that have looked into biomimicry have achieved success based on careful experimental work. Such biomimicry work is usually limited therefore to one length scale and work is needed to capture the process-structure-property-function optimization for H₂O₂ production.



AFRICA RESEARCH INTEREST GROUP

MSU Faculty Experts

Dr. Brian Shoup
College of Arts and Sciences

Dr. Meghan Millea
College of Business

Dr. Matthew Freeman
College of Agriculture and Life Sciences

Dr. William Reihm
College of Architecture

Dr. Anna Linhoss
College of Engineering

Dr. Margaret Khaita
College of Veterinary Medicine

Dr. Bradley Brazzeal
Mitchell Memorial Library

The Africa Research Interest Group (ARIG), founded in 2014, brings together approximately 60 faculty members, staff, and students representing seven MSU colleges and the library. Regular group meetings have manifested in increased awareness of sub-Saharan African-related research interests, the development of six ongoing sub-Saharan Africa research projects, and increased undergraduate and graduate research and study abroad opportunities. Several ARIG faculty accompanied six MSU undergraduate students to South Africa in the summer of 2015 as part of the group's broader engagement with student learning and research. An ongoing ARIG project includes socioeconomic dimensions of zoonotic disease transfer and animal health in developing countries which focuses on the legitimacy of policy and enforcement of disease control impacting the economic viability of international trade. A second ongoing project includes higher education resource services for East Africa focusing on opportunities for women in higher education in East Africa replicating similar programs in South Africa, West Africa, and the U.S.

2015 INTERNATIONAL WORKING GROUPS

Socio-economic Dimensions of Animal Health

MSU Faculty Experts - Dr. Bob Willis, Dr. Brian Shoup, Dr. Brian Rude

Partner - Dr. Dirk Strydom, University of the Free State, Bloemfontein, South Africa

Environmental and Food Security Issues

in Wetland Ecosystems (India's Chilka Lake and Bangladesh's Sundarbans mangrove ecosystem)

MSU Faculty Experts - Dr. Shrinidhi Ambinakudige, Dr. Padmanava Dash, Dr. Raja Reddy, Dr. Prem B. Parajuli

Novel Metal Matrix Metallic Composites Design

MSU Faculty Experts - Dr. Hongjoo Rhee, Dr. Roger King, Dr. Wilburn Whittington

Partner - Hwi-Jun Kim, Korea Institute of Industrial Technology, South Korea

Food Safety Enhancement through Molecular and Conventional Detection Methods

MSU Faculty Experts - Dr. Juan Silva, Dr. Taejo Kim, Dr. Janet Donaldson

Partner - Many Universities in Thailand

Image Analysis in Bio-inspired Materials Design

MSU Faculty Experts - Dr. Hyeona Lim, Dr. Lakiesha Williams, Dr. Jun Liao

Partner - Dr. Myungjoo Kang, Seoul National University, South Korea

Nutritional Genomics and Diabetes

MSU Faculty Experts - Dr. Wen-Hsing Cheng, Dr. Tung-Lung Wu

Partner - Dr. Chinling Wang and Dr. Chi Yu, National Pingtung University of Science and Technology, Taiwan

Middle Eastern Studies

MSU Faculty Experts - Dr. Kate McClellan, Dr. Michael Galaty, Dr. Jimmy Hardin, Dr. Lynn Holt

Partner - Many universities across the Middle East & Mediterranean regions

Comparative Racial Reconciliation

MSU Faculty Experts - Dr. Andrea Spain, Dr. Stephen

Middleton, Dr. Donald Shaffer

Partner - Louis Strydom, Center for Teaching and Learning at the University of Free State, Bloemfontein, South Africa

Women Empowering Women

MSU Faculty Experts - Dr. Meghan Millea, Dr. Kathleen Ragsdale, Dr. Susan Seal

Partner - Dr. Ruth Muwazi, Makerere University, Uganda, Africa

Water Quality Protection from Agriculture Nutrient Pollution

MSU Faculty Experts - John J. Ramirez-Avila; Beth Baker; J. Larry Oldham

Partner - Gustavo Martinez-Rodriguez, University of Puerto Rico

Strengthening and Advancing Food Safety Education

MSU Faculty Experts - Dr. Hart Bailey, Dr. Margaret Khaita, Dr. Byron Williams

Partner - Sylvia Angubua Baluke, Makerere University, Uganda, Africa

Thermodynamics of Biomimicry

MSU Faculty Experts - Dr. Raj Prabhu, Dr. Mark F.

Horstemeyer, Dr. Kenneth O. Willeford, Dr. Fred Musser

Partner - Dr. Andy McIntosh, University of Leeds

Transboundary Research in Wildlife Prevention

MSU Faculty Experts - Dr. Robert K. Grala, Dr. Jason Gordon, Dr. Hugh R. Medal

Partner - Dr. Michal J. Zasada, University of Warsaw, Warszawa, Poland

Environmental and Human Impacts of Fishes and Wetland Habitats

MSU Faculty Experts - Dr. Peter Allen, Dr. Wes Neal,

Dr. Donald Jackson, Dr. Frederico Hoffman, Dr. Gary Ervin, Dr. Matthew Freeman

Partner - Institute for Biotechnology and Environment, Nha Trang University, Vietnam

The Science and Culture of Protected Areas

MSU Faculty Experts - Dr. Brian Counterman, Dr. Gary Evan, Dr. David Hoffman, Dr. Francisco Vilella

Partner - University of Puerto Rico

CONTRIBUTING DEPARTMENTS

Agricultural & Biological Engineering

Agricultural Economics

Animal & Dairy Sciences

Basic Sciences

Biochemistry, Molecular Biology, Entomology and Plant Pathology

Building Construction Science Program

Center for Advanced Vehicular Systems

Civil & Environmental Engineering

Counseling, Education Psychology & Foundations

Finance & Economics

Geosystems Research Institute

Human Sciences

Kinesiology

Landscape Architecture

Mechanical Engineering

Pathobiology & Population Medicine

Physical Education

Political Science & Public Administration

Social Science Research Center

Sociology

Sustainable x

Wildlife, Fisheries & Aquaculture



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About the International Institute

The International Institute enriches and expands the academic and cultural experiences of faculty, staff, students, and the community through global outreach, research, academic programs, and international student services.

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