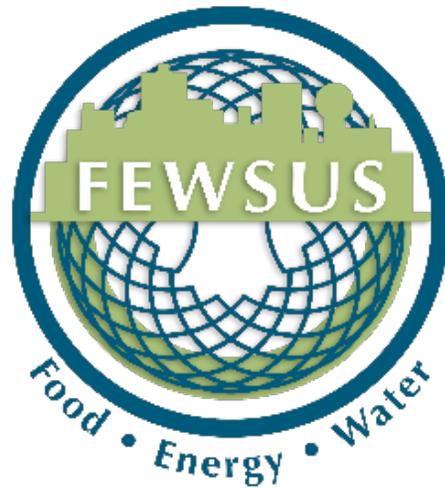


## International Workshop

“TRANSFORMING SMALL FARMS INTO CIRCULAR BIOECONOMY SYSTEMS”



November 19-20, 2025, Knoxville, USA  
website: <https://fewsus.utk.edu>

## SPONSORS & ORGANIZING INSTITUTIONS



## OBJECTIVES

Approximately 90% of 570 million farms worldwide are smallholder farms (<5 acres or \$350,000 in annual gross cash farm income). Although larger farms significantly contribute to economic development, small farms are key to food security, diet diversity, rural economy, urban ecosystem, environmental preservation, and social equity especially in underserved communities of rural and urban areas. Today, most small farms are highly vulnerable to extreme adverse conditions and increasing operation costs. With modern farming being dominated by advanced technology adoption and industrial-scale operations, small farms face immense challenges in resilience and sustainability.

This invitation-only workshop is an annual continuation of the FEWSUS Initiative of the University of Tennessee (UT) since 2020. The FEWSUS name stands for “International Research Coordination Network for Creating Transdisciplinary Nodes of Food-Energy-Water to Support Sustainable Urban-Rural Systems”. The event is co-sponsored by the U.S. National Science Foundation research grant titled *Climate-Smart Food-Energy-Water Nexus in Small Farms*, UT AgResearch, and UT Community of Scholars in Resilient Agriculture and Forest Systems.

The workshop aims to create international/national opportunities for researchers, stakeholders, and students to exchange and summarize knowledge and practices across disciplines, network research resources, and build collaboration in the following areas: food circular bioeconomy, waste-to-value bioeconomy, regenerative precision agriculture, and socioeconomic sustainability of small farming systems.

## OVERALL AGENDA

Date	Time	Scheduled Activity	Venue
November 18 Tuesday	5:30-7:00 pm	Reception	Chesapeake's Downtown
November 19 Wednesday	9:00-12:00 pm	Welcome & Keynotes on Food Circular Bioeconomy	UT Agriculture and Natural Resources Building  <b>ANR 101B</b> Address: 2431 Johnson Dr., Knoxville, TN 37996  Calhoun's on the River
	12:00-1:00 pm	Lunch	
	1:00-4:00 pm	Invited Talks on Waste-to-Value Bioeconomy	
	4:00-5:00 pm	Discussion and Exchange	
	5:15-6:30 pm	Dinner	
November 20 Thursday	9:00-11:00 am	Invited Talks on Regenerative Precision Agriculture	<b>ANR 101B</b> Address: 2431 Johnson Dr., Knoxville, TN 37996  Vida Downtown
	11:10-1:20 pm	Lunch and Invited Talks of Community of Scholars in Resilient Agriculture & Forest System	
	1:30-3:30 pm	Concepts/Preproposal Presentations and Discussions	
	3:30-4:00 pm	Collaborative Publications	
	4:00-5:00 pm	Free Exchange	
	5:15-6:30 pm	Dinner	

## Wednesday, November 19, 2025

9:00-12:00 pm	<b>Welcome &amp; Keynotes on Food Circular Bioeconomy</b> Chair: Frank Löffler (University of Tennessee, Knoxville, USA)
9:00-9:10 am	<b>Welcome</b> by the University Leaders and FEWSUS Advisory Board Chair
9:10-9:15 am	<b>Workshop Objectives</b> by Joe Zhuang (University of Tennessee, Knoxville, USA)
9:15-9:45 am	<b>Can Precision Livestock Farming Generate Value in Small Farms?</b> Daniel Berckmans (Catholic University Leuven, Belgium; University of Tennessee, Knoxville, USA)
9:45-10:15 am	<b>Expanding Black Soldier Fly Beyond Current Industrial Practices: Opportunities &amp; Challenges</b> Jeffery Tomberlin (Texas A&M University, College Station, USA)
10:15-10:30 am	Break
10:30-11:00 am	<b>Challenges of Sustainability for Aquaculture Enterprises and Artisanal Fisheries in Emerging Economies Confronting Global Crises.</b> Ted Henry (Heriot-Watt University, Edinburgh, UK)
11:00-11:30 am	<b>Current Challenges and Future Directions in Crop Nutrient Management</b> Yuji Arai (University of Illinois at Urbana Champaign, USA)
11:30-12:00 pm	<b>Finding Profitability on Every Acre</b> Charles Martinez (University of Tennessee, Knoxville, USA)
12:00-1:00 pm	Lunch
1:00-4:00 pm	<b>Waste-To-Value Bioeconomy</b> Chair: Joe Zhuang (University of Tennessee, Knoxville, USA)
1:00-1:25 pm	<b>Maximizing Biogas Yields via Targeted Bioaugmentation in Anaerobic Digesters</b> Vanja Jurišić (University of Zagreb, Croatia)
1:25-1:50 pm	<b>Micro- and Nanoplastics: A Potential Threat to Agroecosystems</b> Douglas Hayes (University of Tennessee, Knoxville, USA)
1:50-2:15 pm	<b>Circular Food Management Models: Waste Prevention, Recycling, and Reuse</b> Davor Kralik (Josip Juraj Strossmayer University of Osijek, Croatia)
2:15-2:40 pm	<b>Research Opportunities in Water Resources and Their Nexus with Energy and Agriculture in Panama</b> Jose Fabrega (Technological University of Panama, Panama)
2:40-3:05 pm	<b>Small Farm Circular Bioeconomy – A Roadmap for a Healthier Planet?</b> Frank Löffler (University of Tennessee, Knoxville, USA)
3:05-4:00 pm	Q&A and Discussion on Collaboration Opportunities
4:00-5:00 pm	Free Exchange
5:15-6:30 pm	Dinner

## Thursday, November 20, 2025

<b>9:00-11:00 am</b>	<b>Regenerative Precision Agriculture</b> Chair: Hao Gan (University of Tennessee, Knoxville, USA)
9:00-9:20 am	<b>Is Regenerative Agriculture the Future for Tennessee Agriculture?</b> Forbes Walker (University of Tennessee, Knoxville, USA)
9:20-9:40 am	<b>Closing the Loop: Pecan Agroforestry as a Model for Circular and Regenerative Farming at the Southeastern Pampas of Argentina.</b> Gustavo Sebastián Cambareri (National Institute of Agricultural Technology, Argentina)
9:40-10:00 am	<b>Restructuring Soil Pore System to Increase Carbon Sequestration Capacity of Soils</b> Jie (Joe) Zhuang (University of Tennessee, Knoxville, USA)
10:00-10:20 am	<b>The Role of Cover Cropping in Shaping Soil Structure and Subsurface Water Dynamics for Building Resilient Agroecosystems.</b> Xi Zhang (University of Tennessee, Knoxville, USA)
10:20-10:40 am	<b>Transdisciplinary Teamwork in the Era of AI: A Way to Empower Communities and Mitigate Disaster Limitations with Respect to FEW systems.</b> Eminé Fidan (University of Tennessee, Knoxville, USA)
10:40-11:00 am	<b>AI-Enabled Precision Agriculture Management: From Disease Detection to Smart Farming</b> Charles Cao (University of Tennessee, Knoxville, USA)
<b>11:10-1:20 pm</b>	<b>Community of Scholars in Resilient Agriculture and Forest Systems</b> Chairs: Doug Hayes and Sathish Samiappan (University of Tennessee, Knoxville, USA)
11:10-11:30 am	<b>Dynamic Environmental Control Strategies for Resource-Efficient Controlled Environment Agriculture</b> Tabibul Islam (University of Tennessee, Knoxville, USA)
11:30-11:50 am	<b>The Fiscal Impact of Biodiversity Loss and a Pathway for Conservation Finance</b> Dale Manning (University of Tennessee, Knoxville, USA)
11:50-12:00 pm	Lunch Pickup
12:00-12:20 pm	<b>Potential Extension Pathways for Sustainable Agricultural Intensification Practices in Cambodia: Farmer Fields and Secondary School Systems.</b> Lyda Hok (The Royal University of Agriculture, Cambodia)
12:20-12:40 pm	<b>Evidence-Based Land Conservation Framework Using Multi-Criteria Acceptability Analysis</b> Sathish Samiappan (University of Tennessee, Knoxville, USA)
12:40-1:00 pm	<b>Regenerative Agriculture in Middle Tennessee</b> Asher Wright (Caney Fork Farm, Nashville, Tennessee, USA)
1:00-1:20 pm	Summary of Ideas for Team Science
<b>1:30-4:00 pm</b>	<b>Collaborative Action Planning</b> Chair: Joe Zhuang (University of Tennessee, Knoxville, USA)
1:30-3:30 pm	Concepts/Preproposal Presentation and Discussion
3:30-4:00 pm	Collaborative Publications
4:00-5:00 pm	Free Exchange
5:15-6:30 pm	Dinner