

Under the High Patronage of His Majesty King Mohammed VI



XIX WORLD WATER CONGRESS
International Water Resources Association (IWRA)
Marrakech, Morocco | 1-5 December 2025

Kingdom of Morocco



Ministry of
Equipment and Water

Network science and practice: The US-Africa-Europe 'SustainFood' approach to water-energy-food nexus networking

Christopher Scott
Pennsylvania State University
and

Ida Djenontin, Johnny Musumbu, Bassel Daher, Annette Huber-Lee,
Michael Jacobson, Laura Schmitt-Olabisi, Nathan Weyandt

Dec. 3, 2025

Grand challenge



XIX WORLD WATER CONGRESS
International Water Resources Association (IWRA)
Marrakech, Morocco | 1-5 December 2025

- Africa will drive global demographic trends in the coming decades as climate change and the geopolitics of regional energy and water systems further threaten food security globally.
- SustainFood uses a WEF Nexus approach to sustainable food systems by developing solutions that promote:
 1. systems-level understanding of sustainable WEF security
 2. increased STEM participation of under-represented groups in co-identifying solutions; and
 3. advance science-to-policy impacts.



Grand challenge



XIX WORLD WATER CONGRESS
International Water Resources Association (IWRA)
Marrakech, Morocco | 1-5 December 2025

- Africa will drive global demographic trends in the coming decades. Climate change and the geopolitics of regional energy and water resources will further threaten food security globally.

- SustainFood uses a WEF Nexus approach to develop systems by developing solutions that...

1. systems that ensure sustainable WEF security

- ...participation of under-represented groups in co-
- ...solutions; and

...advance science-to-policy impacts.

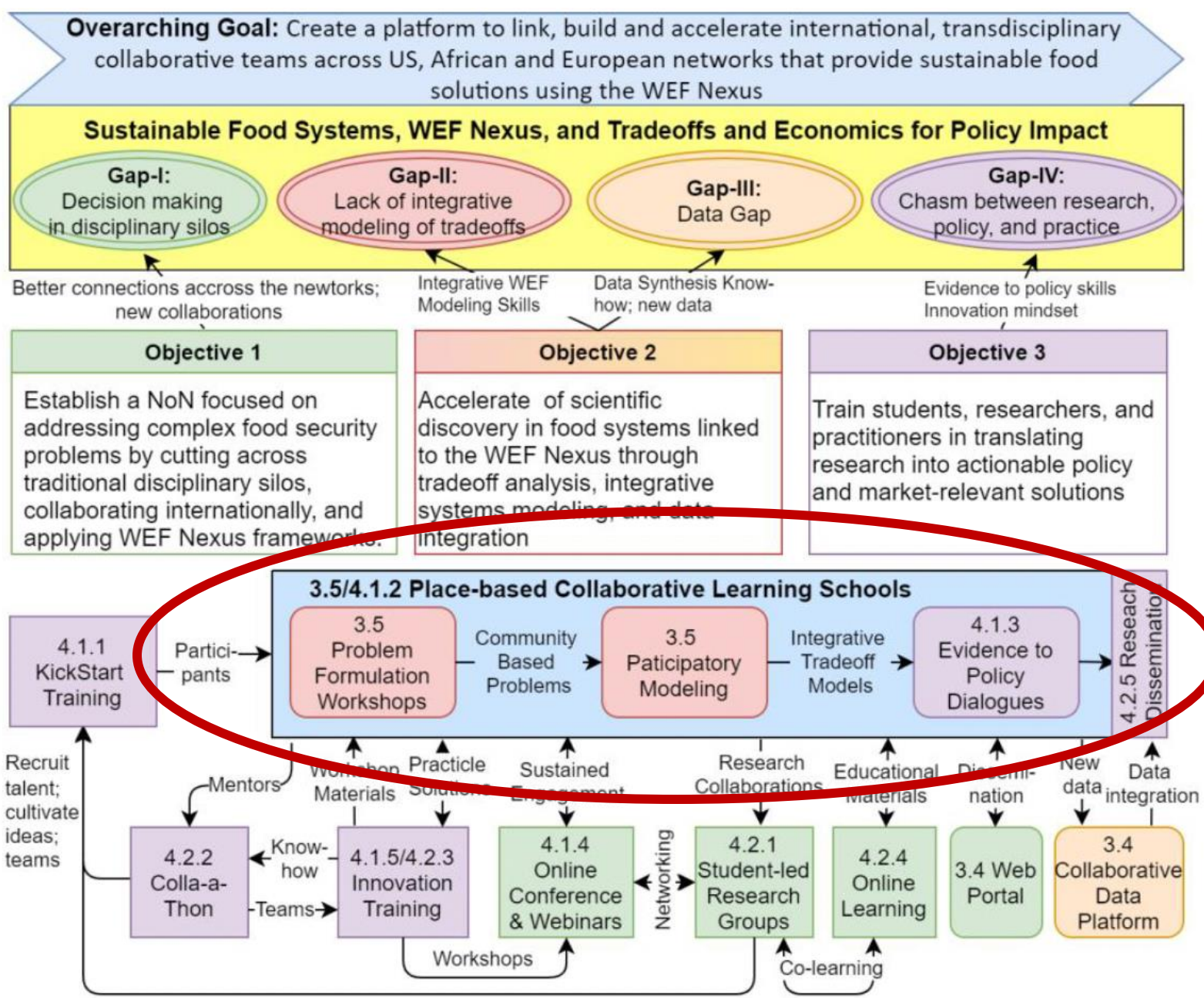
**What do network science and practice add?
Are there better outputs and improved outcomes
that are attributable to network science?**



Sustain Food

Network of Networks

U.S. National Science Foundation



WORLD WATER CONGRESS
 International Water Resources Association (IWRA)
 Marrakech, Morocco | 1-5 December 2025



Collaborative Learning Schools (CLS)

2023 Uganda,
2024 USA,
2025 Nigeria,
2026 Morocco,
2026 Kenya (*in planning*)



XIX WORLD WATER CONGRESS
International Water Resources Association (IWRA)
Marrakech, Morocco | 1-5 December 2025



SustainFood
Collaborative
Learning School,
2023, Uganda

SustainFood Collaborative Learning Schools

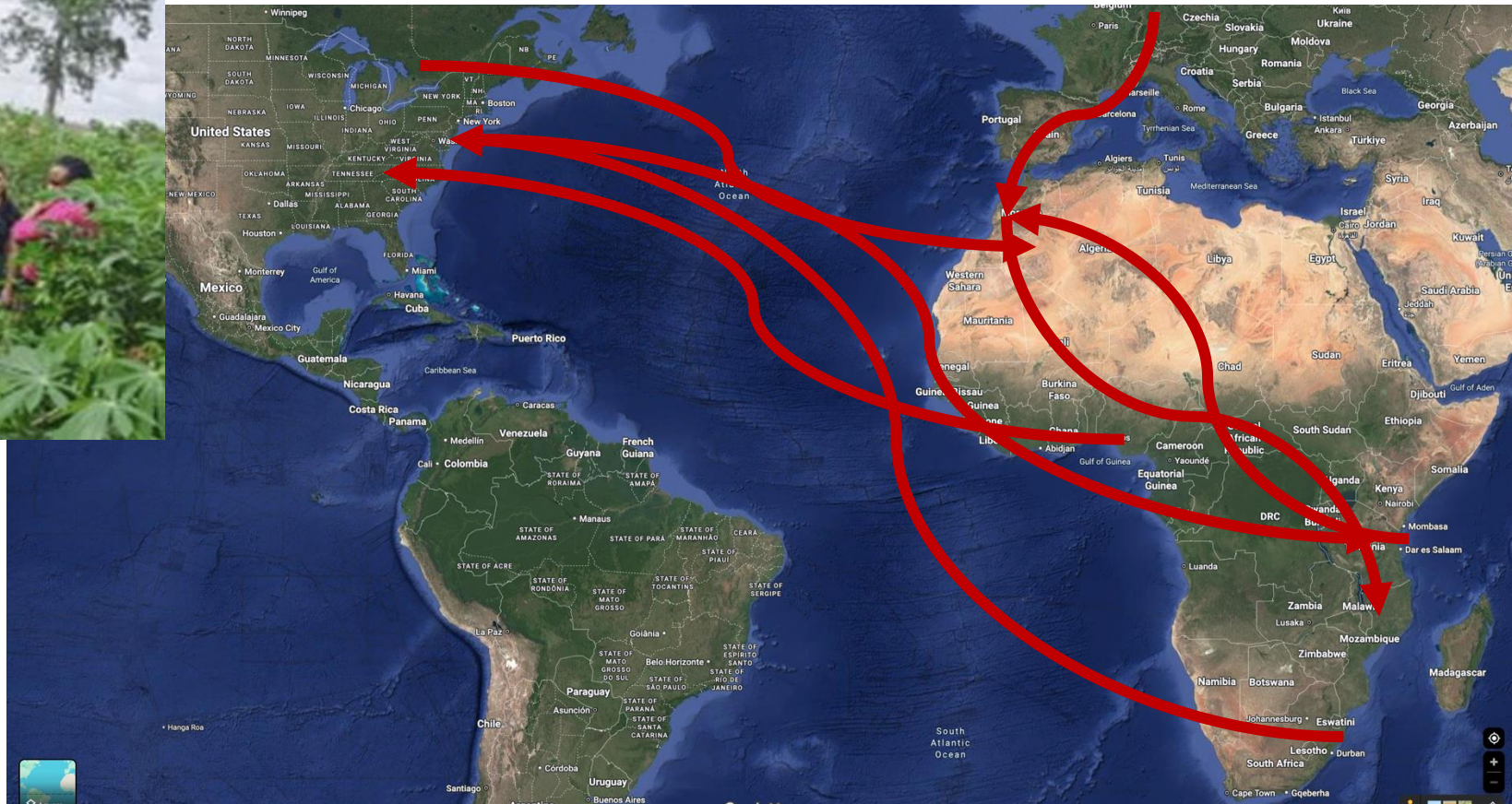
SustainFood 2023 Collaborative Learning School will be held in Uganda from 10-21 July. Week one is dedicated to community-level workshops, which will be centered in Buikwe County, Ddungu Parish, Ngogwe sub-county. In addition to community leaders, approximately 50 farmers from 5 villages in this area will be engaged to identify community-level problems and potential solutions. Week two is dedicated to policy-level workshops. Workshops will engage both community stakeholders, as well as district-level policy makers representing key sectors (e.g. agriculture, water, energy, economy, health, development, etc.).



In-person and hybrid, participant-led, community-outreach focus



XIX WORLD WATER CONGRESS
International Water Resources Association (IWRA)
Marrakech, Morocco | 1-5 December 2025





Practical, short-term solutions, complemented by long-term policy-focus

- Systems thinking: integrated understanding of drivers, adaptive response
- Water-energy-food nexus identification of co-benefits, benefit-sharing
- Internal network cohesion critically important
 - Maintain active participation and engagement of partners beyond the lead group
 - Inclusion of students and early-career professionals - network maintenance is a precursor task of its own
- Hybrid and solely virtual collaboration mechanisms are partially or minimally effective in the absence of in-person network grounding
- SustainFood signature event: annual Collaborative Learning Schools

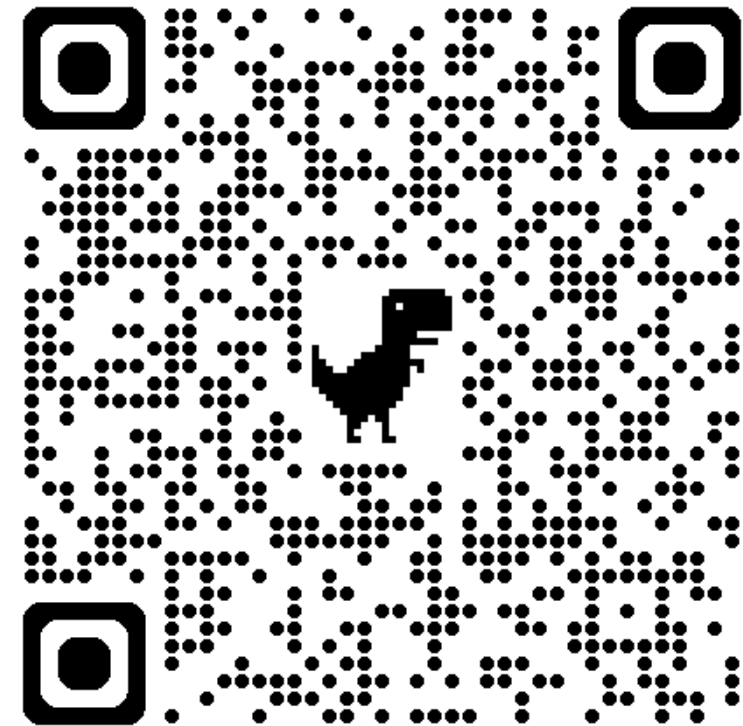
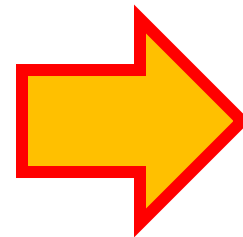


Synthesis and next steps



XIX WORLD WATER CONGRESS
International Water Resources Association (IWRA)
Marrakech, Morocco | 1-5 December 2025

- Leadership by early career researchers
 - PhD students
 - Postdocs
 - Starting asst. professors
 - Staff of public agencies and private sector
- Community-engaged, field-based activities featuring CLSs and Hackathons
- In-person and hybrid events – join here!
- SustainFood network consolidation



Reflections and conclusions



XIX WORLD WATER CONGRESS
International Water Resources Association (IWRA)
Marrakech, Morocco | 1-5 December 2025

- Evolving SustainFood network faced programmatic challenges:
 1. “Goal inflation” - setting of ambitious program goals expected at the proposal stage, ultimately limit flexibility to respond to strategic opportunities later during implementation
 2. Erosion of “think globally”; now faced by “make ... [local] great again” mindset and financial resource re-allocation
 3. Step back from explicitly pursuing climate action goals
 4. Re-budgeting was required
- Future outlook for network science and practice – better outcomes?
 1. Partnerships to enhance WEF security outcomes are here to stay
 2. Inevitably, this will lead to a new set of framing challenges beyond the Nexus and innovative future mechanisms by which to enhance capacity while demonstrating tangible and long-lasting impacts.



Under the High Patronage of His Majesty King Mohammed VI



XIX WORLD WATER CONGRESS
International Water Resources Association (IWRA)
Marrakech, Morocco | 1-5 December 2025

Thank you!

cascott@psu.edu

<https://sustainfood.psu.edu/>

◆ www.worldwatercongress.com ◆