

Paper Summary

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Title: Coproducing water-energy-food Nexus actionable knowledge: Lessons from a multi-actor collaboration

Authors: Djenontin, Ida N.S.; Daher, Bassel; Johnson, Jacob W.; Adule, Kenan; Hishe, Birhanu K.; Kekir

DOI: <https://doi.org/10.1016/j.envsci.2025.104028>

Year: 2025

Publication Type: Journal Article

Discipline/Domain: Environmental Science and Policy

Subdomain/Topic: Water-Energy-Food Nexus; Transdisciplinary Co-Production; Stakeholder Engagement

Eligibility: Eligible

Overall Relevance Score: 93

Operationalization Score: 95

Contains Definition of Actionability: Yes (implicit, contextualized through co-production process and criteria)

Contains Systematic Features/Dimensions: Yes

Contains Explainability: Yes

Contains Interpretability: Partial

Contains Framework/Model: Yes (Collaborative Learning School – CLS)

Operationalization Present: Yes

Primary Methodology: Mixed Methods (qualitative participatory processes + evaluation surveys)

Study Context: WEF Nexus in smallholder and peri-urban farming contexts in Uganda; Buikwe District case study

Geographic/Institutional Context: Uganda – Makerere University collaboration with U.S. and E.U. universities

Target Users/Stakeholders: Farmers, local authorities, district-level officers, national policymakers, NGOs

Primary Contribution Type: Applied case study and methodological innovation

CL: Yes — “fit for purpose, including relevance and affordable to the community at stake”

CR: Yes — “context-driven... pathways for problem-solving-oriented knowledge co-production”

FE: Yes — “cost-effective (low input and build on existing institutions)”

TI: Yes — “importance on short, medium, and long-term for farmers’ livelihood”

EX: Yes — “systems mapping and causal loop diagrams... to understand root causes and interactions”

GA: Yes — “alignment with district and national goals... considered for integration into existing policies”

Reason if Not Eligible: N/A

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Coproducing water-energy-food Nexus actionable knowledge: Lessons from a multi-actor collaborative le

****Authors:****

Ida N.S. Djenontin, Bassel Daher, Jacob W. Johnson, Kenan Adule, Birhanu K. Hishe, Patience Kekirung

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****Discipline/Domain:****

Environmental Science and Policy

****Subdomain/Topic:****

Water-Energy-Food Nexus; Transdisciplinary Co-Production; Stakeholder Engagement; Uganda

****Contextual Background:****

This paper examines how actionable WEF Nexus knowledge can be co-produced through a *Collaborative

****Geographic/Institutional Context:****

Uganda; collaboration between Makerere University, U.S., and E.U. universities, local NGOs, and govern

****Target Users/Stakeholders:****

Smallholder and peri-urban farmers, agricultural cooperatives, district officers, national ministries, NGOs,

****Primary Methodology:****

Mixed Methods (participatory qualitative processes, systems/design thinking workshops, causal loop diag

****Primary Contribution Type:****

Applied methodological case study demonstrating operational pathways for producing actionable WEF N

General Summary of the Paper

The authors introduce the *Collaborative Learning School* (CLS) as a transdisciplinary, multi-actor proce

Eligibility

Eligible for inclusion: ****Yes****

How Actionability is Understood

Actionability is implicitly framed as knowledge and solutions that are:

- Co-created with stakeholders at multiple governance levels.
 - Contextually relevant, fit for purpose, and feasible for local adoption.
 - Operationalized into implementable “pathways to change” validated by both end-users and decision-makers.
- > “...support participatory co-creations of context-driven multi-scalar WEF-Nexus pathways for problem-solving.”
- > “...fit for purpose, including relevance and affordable to the community at stake” (p. 7)

What Makes Something Actionable

- Fit for purpose and community relevance.
- Feasibility and affordability using existing institutions.
- Co-created with diverse stakeholders, incorporating local and technical knowledge.
- Sustainability (short, medium, long-term impacts).
- Potential for scaling and policy integration.
- Immediate visible results to build trust.
- Capacity building and intergenerational collaboration.

How Actionability is Achieved / Operationalized

- **Framework/Approach Name(s):** Collaborative Learning School (CLS)
 - **Methods/Levers:** Systems thinking, design thinking, political economy analysis, participatory mapping
 - **Operational Steps / Workflow:**
 1. Community problem identification (focus groups, transects, interviews).
 2. Systems mapping & solution ideation (causal loop diagrams, brainstorming).
 3. Solution prototyping (physical models).
 4. Validation (community, district, national workshops).
 - **Data & Measures:** Post-evaluation surveys, interviews, observational data, stakeholder feedback on
 - **Implementation Context:** Multi-scalar engagement from local farmers to national ministries.
- > “...systems mapping and causal loop diagrams... envisage innovative solutions collaboratively with the community.”
- > “...prototyped models... facilitated presenting complex ideas to various stakeholders, furthering understanding of the problem and potential solutions.”

Dimensions and Attributes of Actionability (Authors’ Perspective)

- **CL:** Yes — Clarity through shared understanding, visual mapping, and tangible prototypes.
- **CR:** Yes — Solutions directly emerged from locally identified WEF Nexus issues.
- **FE:** Yes — Emphasis on cost-effectiveness and building on existing institutions.

- ****TI:**** Yes — Importance across short, medium, long-term livelihoods.
- ****EX:**** Yes — Systems mapping to clarify cause-effect relationships and trade-offs.
- ****GA:**** Yes — District and national alignment discussed and sought for integration.
- ****Other Dimensions:**** Trust-building, inclusivity, capacity development.

Theoretical or Conceptual Foundations

- WEF Nexus framework.
- Systems thinking (causal loop diagrams, holistic problem framing).
- Design thinking (human-centered iterative problem-solving).
- Political Economy Analysis.

Indicators or Metrics for Actionability

- Stakeholder-perceived feasibility, relevance, and alignment with goals.
- Willingness to implement and allocate resources.
- Immediate visible results to build trust.

Barriers and Enablers to Actionability

****Barriers:****

- Limited access to extension services.
- Lack of farmer cooperation.
- Gaps between community priorities and national programs.
- Funding constraints.
- Weak communication channels between governance levels.

****Enablers:****

- Cooperative formation and farmer organization.
- Integration into existing policy frameworks.
- Multi-level stakeholder engagement.
- Local knowledge and technical expertise integration.

Relation to Existing Literature

The CLS builds on farmer field school approaches, transdisciplinary WEF Nexus research, and co-production.

Summary

This paper offers a fully articulated, operational framework (CLS) for producing actionable WEF Nexus knowledge.

Scores

- **Overall Relevance Score:** 93 — Strong implicit definition of actionability, detailed features tied to the problem.
- **Operationalization Score:** 95 — Provides a concrete, tested, and replicable process with clear steps.

Supporting Quotes from the Paper

- “[CLS]...support participatory co-creations of context-driven multi-scalar WEF-Nexus pathways for problem-solving.”
- “Fit for purpose, including relevance and affordable to the community at stake” (p. 7)
- “Systems mapping and causal loop diagrams... envisage innovative solutions collaboratively with the stakeholders.”
- “Prototyped models... facilitated presenting complex ideas to various stakeholders, furthering understanding.”

Actionability References to Other Papers

- Djenontin & Meadow (2018) — Co-production guidance.
- Naidoo et al. (2021) — WEF Nexus operationalization methodology.
- Hamidov et al. (2022) — Nexus summer school model.
- Johnson & Karlberg (2017) — Participatory WEF modeling.
- Purwanto et al. (2019); Rich et al. (2018) — Group model building and stakeholder engagement in Nexus.