Paper Summary

<!--META_START-->

Title: Bridging the knowledge–action gap: A framework for co-producing actionable knowledge

Authors: Aleksi Räsänen, Simo Sarkki, Olli Haanpää, Maria Isolahti, Hanna Kekkonen, Karoliina Kikuchi,

DOI: https://doi.org/10.1016/j.envsci.2024.103929

Year: 2024

Publication Type: Journal

Discipline/Domain: Environmental Science / Sustainability Science

Subdomain/Topic: Knowledge co-production, catchment governance, transdisciplinary research

Eligibility: Eligible

Overall Relevance Score: 95

Operationalization Score: 92

Contains Definition of Actionability: Yes (explicit and process-based)

Contains Systematic Features/Dimensions: Yes

Contains Explainability: Partial

Contains Interpretability: Partial

Contains Framework/Model: Yes (three-process integrated framework)

Operationalization Present: Yes (nine-step, four-phase process)

Primary Methodology: Mixed Methods (qualitative, quantitative, participatory, collaborative autoethnograp

Study Context: Transdisciplinary project in Kiiminkijoki river catchment, Finland

Geographic/Institutional Context: Northern Finland; multiple municipalities and stakeholder groups

Target Users/Stakeholders: Researchers, policymakers, local communities, administrative bodies, civil so

Primary Contribution Type: Conceptual framework + empirical case study

CL: Yes

CR: Yes

FE: Yes

TI: Partial

EX: Partial

GA: Yes

Reason if Not Eligible: n/a

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Bridging the knowledge–action gap: A framework for co-producing actionable knowledge

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Discipline/Domain:

Environmental Science / Sustainability Science

Subdomain/Topic:

Knowledge co-production, catchment governance, transdisciplinary research

Contextual Background:

The paper addresses how transdisciplinary research can bridge the persistent gap between knowledge g

Geographic/Institutional Context:

Northern Finland, involving municipal authorities, NGOs, research institutions, and local landowners.

Target Users/Stakeholders:

Researchers, policymakers, local communities, administrative actors, civil society groups, landowners, ar

Primary Methodology:

Mixed Methods — qualitative interviews, participatory workshops, GIS analysis, forestry simulations, litera

Primary Contribution Type:

Conceptual framework integrated with empirical application.

General Summary of the Paper

The authors critique the dominant output-focused concept of actionable knowledge and instead conceptu

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Eligibility

Eligible for inclusion: **Yes**

How Actionability is Understood

Actionable knowledge is defined as a **process**—not merely outputs—characterized by:

1. **Cumulative and stepwise** phases that build towards catalyzing action.

2. **Iterative and cyclical** interactions that allow reframing and adaptation.

3. **Coevolutionary** dynamics where knowledge and action continuously shape each other.

> “We instead propose to understand actionable knowledge as a process that has (1) cumulative and ste

> “Actionable knowledge… is not the output per se but the process of actionable knowledge production a

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What Makes Something Actionable

- Integration of diverse knowledge systems (scientific, local, administrative).

- Co-definition of problems aligned with societal agendas.

- Societal validation and experimentation (pilots, participatory assessments).

- Usable, solution-oriented outputs grounded in co-production.

- Boundary spanning to sustain momentum and coordinate across actors.

- Contextual alignment with stakeholder values, priorities, and governance structures.

How Actionability is Achieved / Operationalized

Framework/Approach Name(s):

Four-phase process + Nine-step roadmap

Methods/Levers:

Participatory workshops, semi-structured interviews, GIS analysis, forestry simulations, pilot projects, coll

Operational Steps / Workflow:

1. Problem definition

2. Stakeholder identification

3. Background data collection

4. Pilot measures for validation

5. Visioning desirable futures

6. Impact assessment of measures

7. Stakeholder deliberation of results

8. Synthesis into roadmap

9. Establishment of catchment coordinator (boundary spanning)

Data & Measures:

GIS spatial datasets, water quality data, forestry growth and carbon simulations, participatory mapping, s

Implementation Context:

Catchment-scale land-use governance with overlapping environmental, social, and economic objectives.

Dimensions and Attributes of Actionability (Authors' Perspective)

- **CL (Clarity):** Yes — Roadmap synthesis reduced complexity into accessible format.
- **CR (Contextual Relevance):** Yes — Problem reframed to match local water quality priorities.
- **FE (Feasibility):** Yes — Measures assessed for technical, social, and economic viability.
- **TI (Timeliness):** Partial — Iterative process responsive to emerging opportunities, but long-term cycl
- **EX (Explainability):** Partial — Process transparency emphasized; less focus on formal explainability
- **GA (Goal Alignment):** Yes — Co-defined goals and integration of stakeholder visions.
- **Other Dimensions Named by Authors:** Legitimacy, credibility, usability, and societal validation.

Theoretical or Conceptual Foundations

- Cash et al. (2003) attributes of knowledge (credibility, legitimacy, relevance)
- Co-production and social robustness literature (Nowotny 2003; Roux et al. 2006)
- Coevolutionary theory (Jasanoff 2004; Klenk 2018)
- Transdisciplinary research cycle models (Jahn et al. 2012; Hoffmann et al. 2019)
- Meshwork concept (Deleuze & Guattari 1987; Ingold 2011)

Indicators or Metrics for Actionability

- Uptake and implementation of roadmap measures.
- Establishment of a permanent catchment coordinator.
- Stakeholder engagement breadth and continuity.
- Reduction in environmental impact indicators (modeled/monitored).

Barriers and Enablers to Actionability

Barriers:

- Divergent priorities (e.g., climate vs. water quality).
- Limited scientific certainty for some measures.
- Fragmented governance and land ownership.
- Resistance from economically focused actors.

Enablers:

- Early stakeholder engagement and trust building.

- Pilot projects demonstrating feasibility.
- Clear, co-created vision and roadmap.
- Dedicated boundary spanning role.

Relation to Existing Literature

Positions itself against the dominant “knowledge-first” linear model by integrating cumulative, iterative, an

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Summary

This paper reconceptualizes actionable knowledge as an ongoing process rather than discrete outputs. U

Scores

- **Overall Relevance Score:** 95 — Strong conceptualization of actionability with explicit process framin
- **Operationalization Score:** 92 — Clear nine-step, four-phase operationalization with concrete method

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Supporting Quotes from the Paper

- “We instead propose to understand actionable knowledge as a process that has (1) cumulative and step
- “Actionable knowledge… is not the output per se but the process of actionable knowledge production ar
- “Without a shared problem, there cannot be shared problem solving, and collective action becomes imp
- “Integration of diverse systems of knowledge… increases potential to generate action.” (p. 11)
- “The catchment coordinator… should be the central node for knowledge and action within the catchmen

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Actionability References to Other Papers

- Cash et al. (2003) — Credibility, legitimacy, relevance framework
- Nowotny (2003) — Socially robust knowledge
- Roux et al. (2006) — Knowledge interfacing
- Jasanoff (2004) — Co-production of science and social order
- Jahn et al. (2012) — Transdisciplinary phases
- Hoffmann et al. (2019) — Iterative processes in transdisciplinary research
- Klenk (2018) — Meshwork concept