

A Map of Evidence Maps: Navigating the Landscape of Sustainable Development Research

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In the contemporary era of data-driven policymaking, the volume of scientific literature and impact evaluations has experienced an exponential surge. However, a significant challenge remains: the fragmentation of this knowledge makes it difficult for decision-makers to identify what interventions work, under what conditions, and where the most critical knowledge gaps lie. This is particularly true in the context of the **Sustainable Development Goals (SDGs)** and international development interventions in **Low- and Middle-Income Countries (LMICs)**. To address this, the concept of a **Map of Evidence Maps (MoEM)** has emerged as a high-level meta-synthetic tool. This article provides a technical and comprehensive analysis of the methodology, framework, and implications of mapping evidence maps within the global development sector.

The Conceptual Framework of Evidence Gap Maps (EGMs)

Before delving into a Map of Evidence Maps, it is essential to define the foundational unit: the **Evidence Gap Map (EGM)**. Developed largely by organizations like the **International Initiative for Impact Evaluation (3ie)** and the **Campbell Collaboration**, an EGM is a thematic collection of evidence structured around a framework of interventions and outcomes. Unlike a systematic review, which synthesizes the results of studies to provide an effect size, an EGM focuses on the *availability* and *characteristics* of evidence.

Core Objectives of Evidence Mapping

- **Visualizing the Evidence Landscape:** Using a matrix format to show where research is clustered and where it is absent.
- **Reducing Research Waste:** Preventing the commissioning of redundant studies in areas already saturated with high-quality systematic reviews.
- **Informing Strategic Investment:** Guiding funders toward 'absolute gaps' (where no primary research exists) and 'synthesis gaps' (where primary research exists but has not been systematically reviewed).
- **Enhancing Accessibility:** Providing a user-friendly interface for policymakers who require rapid overviews of specific sectors.

The Hierarchy of Evidence Synthesis

To understand the 'Map of Maps' concept, one must recognize the hierarchy of evidence synthesis. In this structure, each level provides a higher degree of abstraction and a broader scope of coverage:

1. **Primary Studies:** Impact evaluations, randomized controlled trials (RCTs), and quasi-experimental designs.
2. **Systematic Reviews:** Synthesis of primary studies to answer a specific research question.
3. **Evidence Gap Maps (EGMs):** Collections of systematic reviews and impact evaluations across a whole sector (e.g., Education or Agriculture).
4. **Map of Evidence Maps (MoEM):** A systematic cataloging of existing EGMs across multiple sectors, often aligned with global frameworks like the SDGs.

Methodological Rigor: The 3ie and World Bank Frameworks

The technical construction of a Map of Evidence Maps, as outlined in the work of **D. Phillips (2017)** and others,

involves a modified version of the standard EGM methodology. This approach ensures that the resulting meta-map is both rigorous and relevant to the **World Bank's intervention sectors** and the UN's Sustainable Development Goals.

1. Defining the Scope and Search Strategy

The process begins with a systematic search across multidisciplinary databases (such as PubMed, Scopus, and Web of Science) and gray literature repositories (such as the 3ie Evidence Hub and the Campbell Library). The criteria for inclusion are strictly defined: only **systematic-evidence maps** that focus on development interventions in LMICs are considered. This excludes simple bibliometric analyses or literature reviews that do not follow systematic methods.

2. The Intervention-Outcome Matrix

The technical core of the map is the **Intervention-Outcome Matrix**. For a Map of Evidence Maps, this matrix is adapted to categorize higher-level data:

- **Intervention Sectors:** Adapted from the World Bank's categorization, including sectors like Agriculture, Education, Energy and Mining, Financial Sector, Health, and Social Protection.
- **Outcome Domains:** These are mapped directly to the 17 Sustainable Development Goals, such as No Poverty (SDG 1), Quality Education (SDG 4), and Climate Action (SDG 13).

3. Data Extraction and Coding

Each identified evidence map is coded according to several technical dimensions:

- **Geographic Coverage:** Identifying if the evidence is global or specific to regions like Sub-Saharan Africa or South Asia.
- **Map Quality:** Assessing the rigor of the included maps using tools like AMSTAR (A MeaSurement Tool to Assess systematic Reviews) or specific EGM quality checklists.
- **Temporal Trends:** Tracking the publication year to identify growth in evidence synthesis capacity.

Comparative Analysis: Evidence Maps vs. Other Synthesis Products

The following table illustrates the technical differences between various evidence products to clarify why a Map of Evidence Maps is a distinct and necessary tool for global development.

Feature	Systematic Review	Evidence Gap Map (EGM)	Map of Evidence Maps (MoEM)
Unit of Analysis	Individual Studies (RCTs, QEDs)	Reviews and Primary Studies	Existing Evidence Gap Maps
Primary Goal	Synthesize findings/effects	Identify evidence gaps and clusters	Catalog the landscape of maps
Breadth of Scope	Narrow (Specific Question)	Broad (Sector-wide)	Very Broad (Global/Cross-sectoral)
Output Format	Narrative and Meta-analysis	Interactive Matrix/Visual Tool	Database/Brief of existing maps
Decision Support	Evidence of effectiveness	Strategic research planning	High-level policy architecture

Technical Workflow for Constructing a Map of Evidence Maps

Executing a MoEM requires a structured procedural approach to maintain technical integrity and ensure the results are replicable. The following steps represent the standard engineering of such a project:

Phase I: Preparation and Protocol

Before searching, a protocol is developed. This includes defining **PICTOS** (Population, Intervention, Comparison, Type of Map, Outcome, Setting). In the context of the JSON data provided, the population focuses on **Low- and Middle-Income Countries**, and the setting is **Sustainable Development**.

Phase II: Systematic Search and Screening

Researchers utilize Boolean operators to construct complex search strings. For example: ("evidence map" OR "gap map" OR "mapping review") AND ("sustainable development" OR "LMIC" OR "developing countries"). The screening process is usually conducted in two stages (title/abstract and full-text) by independent reviewers to ensure a low **False Discovery Rate (FDR)**.

Phase III: Mapping and Visualization

The data is plotted into a matrix. In modern implementations, this is often done using specialized software like **EPPI-Mapper** or **Tableau**. Bubbles within the matrix represent the number of maps found at the intersection of a sector (e.g., Health) and an outcome (e.g., Well-being). The size of the bubble often correlates with the volume of maps, while the color might represent the quality or the types of studies included within those maps.

Case Study Analysis: Evidence Distribution in LMICs

Data from recent Map of Evidence Maps reports reveals critical trends in how evidence is distributed across the globe. By analyzing impact evaluations by geographic location, researchers have found a significant imbalance. For instance, while Sub-Saharan Africa and South Asia have a relatively high density of evidence maps related to **Social Protection** and **Health**, there are profound gaps in **Infrastructure** and **Industrial Innovation** (SDG 9) within these same regions.

Technical Finding: The 'Evidence Paradox'

The 'Evidence Paradox' refers to the phenomenon where the sectors receiving the most funding are sometimes those with the least mapped evidence. For example, large-scale infrastructure projects in LMICs often lack the rigorous impact evaluation maps found in smaller-scale microfinance or education interventions. A MoEM highlights these discrepancies, allowing the **United Nations Environment Programme (UNEP)** and the **World Bank** to recalibrate their research priorities.

Quality Assessment and Limitations

A Map of Evidence Maps is only as good as the maps it includes. Technical writers and researchers must address potential failure modes in the underlying data:

- **Language Bias:** Many maps exclusively include English-language literature, leading to an underrepresentation of evidence from Francophone Africa or Latin America.
- **Database Lag:** The time between primary study publication, systematic review synthesis, and the eventual inclusion in an EGM can be several years.
- **Methodological Heterogeneity:** Different organizations use slightly different definitions of what constitutes a 'gap,' which can complicate the aggregation of maps in a MoEM.

Solution: Implementing Standardized Reporting

To solve these issues, the development community is moving toward standardized reporting guidelines for evidence maps, similar to the **PRISMA** (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. This ensures that every map included in a MoEM has met a baseline level of methodological transparency.

Practical Applications for Policy and Research

The utility of a Map of Evidence Maps extends across the entire lifecycle of development programming. Below is a guide on how different stakeholders can implement these findings:

For Research Commissioning Bodies

1. **Identify Over-researched Areas:** Use the MoEM to see where evidence is 'saturated' and avoid funding more of the same.
2. **Direct Funding to Neglected SDGs:** If the MoEM shows no maps for SDG 14 (Life Below Water) in LMICs, this becomes a priority for the next funding cycle.

For National Governments in LMICs

1. **Evidence-Informed Budgeting:** Align national budgets with intervention types that have a high density of supportive evidence maps.
2. **Gap Identification:** Identify where national data collection must be strengthened to feed into future global evidence maps.

Future Directions: AI and Living Evidence Maps

The next frontier in this technical field is the transition from 'static' maps to **Living Evidence Maps**. By integrating **Machine Learning (ML)** and **Natural Language Processing (NLP)**, researchers can automate the identification of new studies and automatically update the Map of Evidence Maps in real-time. This reduces the 'evidence-to-policy' lag and ensures that the map remains a relevant tool in the rapidly changing landscape of sustainable development.

As we advance toward the 2030 deadline for the Sustainable Development Goals, the ability to synthesize the

syntheses—to map the maps—will be the cornerstone of a sophisticated, evidence-based global development strategy. By providing a macro-view of the knowledge landscape, a Map of Evidence Maps ensures that our path toward sustainability is paved with rigorous data rather than just good intentions. The integration of World Bank sectoral frameworks and SDG outcomes provides a robust architecture for this endeavor, enabling a clearer understanding of our progress and the hurdles that remain.

Tags: #Evidence Gap Maps #Sustainable Development Goals #3ie Methodology #Impact Evaluation #LMICs

