

Rethinking hierarchies of evidence for sustainable food systems

Indigenous Peoples' and other traditional knowledge systems are often deemed to be 'unscientific' within conventional hierarchies of evidence-making. Science-policy processes to build a legacy from the commitments of the UN Food Systems Summit must ensure that due recognition, acceptance and prominence are given to traditional knowledge systems.

The Global-Hub on Indigenous Peoples' Food Systems

Not all evidence is created equal. Recent decades have seen the development of numerous hierarchies of evidence, which attempt to rank different research methods according to the strength of their findings, and thus provide a sound and defensible foundation for science-based policy development (Fig. 1). The first formal hierarchies of evidence emerged in the clinical sciences to facilitate assessments of the effectiveness of medical interventions. They implicate the greater (or lesser) legitimacy of certain forms of evidence, according to the extent to which the effects of bias and confounding factors can be minimized. According to such hierarchies, traditional knowledge systems are relegated to the lowest level. Based on accumulated observations of local phenomena, often held in oral rather than written forms, and holistic rather than specialist, Indigenous Peoples' and other traditional knowledge systems are often regarded as un- or less scientific, anecdotal, and inapplicable to and/or incapable of addressing emerging global challenges.

Despite much critique and suggested alteration over the years, conventional hierarchies of evidence have — explicitly and implicitly — become widely used in other non-clinical sectors to defend or reject policy recommendations as 'evidence-based'. Dialogues, written outputs and scientific sessions associated with the United Nations Food Systems Summit (UNFSS) has extolled the virtues of evidence-based and scientific approaches to food systems transformations and emphasized technological innovation. Positioned as the 'People's Summit', valuable evidence-based contributions were made throughout the UNFSS by Indigenous Peoples' and other traditional knowledge systems, which, despite having been practiced by millions of people across the world for millennia, continue to be marginalized in policy and practice. We propose that traditional knowledge,

specifically Indigenous Peoples' traditional knowledge, must continue to be seen as legitimate science and of equal value to other forms of evidence if the goals of the UNFSS — and of sustainable food systems more broadly — are to be realized.

Whose knowledge counts?

The exclusion of Indigenous Peoples' and other traditional knowledge within science-based policy has a long history, which precedes the establishment of formal hierarchies of evidence. Indigenous Peoples' traditional knowledge is often held and transmitted orally, manifested in acts of teachings, storytelling, folklore, songs, poems, art, dance, objects and ceremonies. It comprises accumulated observations and monitoring of local ecosystems, social systems and their interrelation in certain contexts/conditions¹. Holistic, inclusive and interrelated values are emphasized over individual values, and subject-object and human-nature dichotomies are avoided. In contrast, dominant, often western, scientific knowledge has been perceived as objective, exclusive and the realm of experts. Scientists seek replicable findings, making use of standardized units and categories, seeking ways to mitigate bias and identify 'truth'. Dominant scientific knowledge is written, can be stored and analysed, and has historically been conceived as universal knowledge that can be transported and usefully applied in multiple and diverse contexts.

There are countless historical examples whereby dominant science and technologies have been privileged over traditional knowledge systems, resulting in the top-down implementation of irrelevant, contextually inappropriate and ineffective policy solutions that have exacerbated social disparities and social exclusion. The Green Revolution, as just one widely cited example relating to food systems, endeavoured to modernize agricultural practice with new

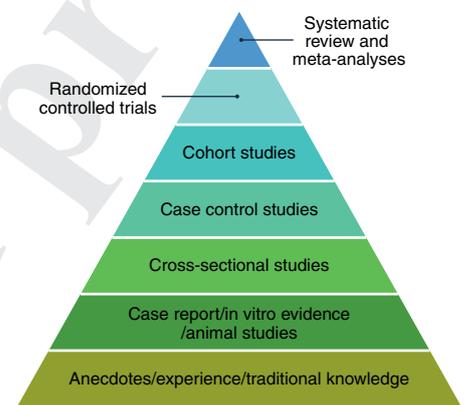


Fig. 1 | Conventional hierarchy of scientific evidence. Traditional knowledge is relegated to the position of lowest quality¹³.

high-yielding 'miracle crops' requiring high chemical inputs. Local traditional knowledge and subsistence livelihoods were supplanted with industrial agriculture and a prescriptive system of science with its own inherent biases. This had dire consequences on human, ecological and economic health in many regions and populations, especially among marginalized groups such as smallholder farmers and Indigenous Peoples².

From the 1970s, a wave of exploration in the value of traditional knowledge, including Indigenous Peoples' traditional knowledge, in the field of agricultural development resulted in major publications, which called for reassessment of "whose knowledge counts?"³. Since then, there has been increasing consensus in scholarly communities of the need to integrate different knowledge systems and practices in horizontal (non-hierarchical) ontologies, participatory processes and policy instruments, as a powerful way to pursue sustainable and equitable development. 'Co-production' is part of an

evolving cluster of approaches (including participatory research, post-normal science, transdisciplinarity and knowledge co-creation) that describe “collaborative processes involving diverse types of expertise, knowledge and actors to produce context-specific knowledge and pathways towards a sustainable future”⁴. Through explicit equal recognition of multiple ways of knowing and doing, co-production facilitates the democratization of science, policy and practice, and supports effective policy responses to emerging global challenges such as hunger, climate crises and pandemics through acknowledgement of the complementary in different systems of knowledge.

The recognition of Indigenous Peoples’ traditional knowledge systems as valuable is thus not new, and there has long been acknowledgement that Indigenous Peoples are well placed to provide expert contributions to global debates on sustainable food systems — as they are currently doing for other global processes pertaining to climate change, biodiversity and conservation. Indigenous Peoples’ traditional knowledge and innovations underpin some of the most sustainable, nutrition-driven and resilient food systems in the world, supporting the health and well-being of people and Mother Earth. Indigenous Peoples safeguard 80% of global biodiversity in around a quarter of the world’s landmass⁵; their food systems often entail hundreds of food species that provide important sources of dietary energy, macro- and micronutrients all year round and/or at times of food crises^{1,6,7}. Furthermore, there are many examples of unique food system innovations that result from the blending of Indigenous and non-Indigenous Peoples’ knowledge, including the use of drone technology to support efforts to combat deforestation and mobile applications to track sea ice and wildlife. *The White/Wiphala Paper on Indigenous Peoples’ Food Systems*¹, a recent publication coordinated by the Global-Hub on Indigenous Peoples’ Food Systems, constitutes a strong evidence base on the contributions of Indigenous Peoples to sustainable food systems transformations. A string of other publications from past decades, including *Indigenous Peoples’ Food Systems: The Many Dimensions of Culture, Diversity and Environment for Nutrition and Health*⁶, *Indigenous Peoples’ Food Systems and Well-being: Interventions and Policies for Healthy Communities*⁷ and recently *Indigenous Peoples’ Food Systems: Insights on Sustainability and Resilience from the Front Line of Climate Change*⁸, represent further accumulated evidence on the strengths,

lessons and good practices that Indigenous Peoples hold for sustainable food systems transformation, and demonstrate the game-changing contributions they can make to the triple challenge of food, biodiversity and climate change.

Rethinking hierarchies of knowledge

Today, several leading science–policy platforms, including the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the Intergovernmental Panel on Climate Change (IPCC), recognize Indigenous Peoples’ traditional knowledge as valuable within their assessment processes⁹. There have been recent suggestions that a similar programme of stakeholder engagement for global food science and policy may be apt^{10,11}. In September 2020, during the 27th session of the Committee on Agriculture (COAG, 2020), the endorsement by Food and Agriculture Organization (FAO) Members of the establishment of the FAO Global-Hub on Indigenous Peoples’ Food Systems drew renewed attention to questions of relevance in dominant hierarchies of knowledge, and to the importance of processes of co-creation and exchanges of knowledge between Indigenous Peoples and the scientific community. In May 2021, the acceptance by the UN Food Systems Scientific Group of *The White/Wiphala Paper on Indigenous Peoples’ Food Systems*¹, represented a turning point on the need to expand the boundaries of scientific knowledge to include Indigenous Peoples’ oral knowledge and other ways of producing knowledge.

Actions and alliances emanating from the UNFSS must urgently learn from these other global processes, which have put suitable mechanisms in place to engage with and assess the value of Indigenous Peoples’ traditional knowledge, as well as revisit the Summit’s own recent history of engagement with these issues. After the lessons of decades of critical engagement with the misuse of scientific knowledge and authority, the community must avoid making the same mistakes as previous attempts to ‘revolutionize’ food systems.

To critique prevailing hierarchies of scientific knowledge is not to deny the value of scientific interventions but (re) demands scrutiny over issues of legitimacy and credibility in expertise and enable more horizontal structures of knowledge and evidence-based policy creation. We have learned through experience that silver bullet policy solutions do not exist, and that one size does not fit all. Thus, it is important to ask what forms of knowledge can be useful in certain contexts and how can

diverse communities of knowledge be seen as complementary in identifying effective, sustainable and inclusive policy solutions. Despite dominant conceptualizations of hierarchy and difference, there do exist notable points of similarity and complementarity between dominant scientific and Indigenous Peoples’ traditional knowledge¹², and Indigenous Peoples’ traditional knowledge must be recognized as an equally legitimate science.

Indigenous Peoples’ traditional knowledge must be seen as having methodological, substantive and contextual strengths equal to or indeed beyond those of many (dominant) scientific study designs. Indigenous Peoples’ traditional knowledge is methodologically sound, accumulated through repeated cycles of induction and deduction, and is informed by — and dynamically adjusted according to — systematic observations, experiences, trials and practice. Such observations and processes often span timeframes far longer than many (longitudinal) scientific studies and pre-date the relatively recent history of satellite imaging. Substantively, Indigenous Peoples’ traditional knowledge holds much relevance to contemporary food systems challenges: detailed understandings of the complex socio-ecological mechanisms and interactions at play in natural ecosystems and food generation environments hold immense value, for example, to food systems modelling, enabling model parameterization. Contextually, and of particular value to sustainable food policy, is the unique linkage of Indigenous Peoples’ traditional knowledge to the local environment. In contrast with the forms of evidence typically found at the peak of conventional evidence hierarchies, which emphasize external validity and generalized application, Indigenous Peoples’ traditional knowledge is well placed to inform food policies that require sensitivity and in-depth understanding of local ecosystems, biodiversity and cultures. In many contexts, the relevance and appropriateness of a hierarchy that values generalized over localized evidence is questionable. And with the upscaling of Indigenous Peoples’ traditional knowledge challenging, there is much to gain from acknowledging the complementarity of dominant scientific knowledge and traditional systems of knowledge.

Legacy of a People’s Summit

Not all evidence is the same and, equally, not all types of evidence are as strong or as appropriate in all settings. Methodologies and sources of evidence must be assessed and valued in accordance with the context

132 in which they are to be applied — including
 133 oral forms of knowledge. Such nuanced
 134 recognition is needed if we are to realize
 135 healthy, sustainable, equitable and resilient
 136 food systems transformations.

137 Indigenous Peoples are well placed to
 138 provide expert contributions to debates
 139 surrounding sustainable food policy,
 140 as they are currently doing for other
 141 global processes. With urgent need for
 142 radical transformation of our global food
 143 systems, the value and appropriateness of
 144 conventional hierarchies of evidence must
 145 be reconsidered in food systems science and
 146 policy to give Indigenous Peoples' traditional
 147 knowledge the opportunity to contribute
 148 to evidence-based food policy fora as a
 149 time-tested, legitimate approach, and grant
 150 it recognition and respect by scientific
 151 communities and policymakers. This
 152 recognition must be done within the context
 153 of self-determination, with appropriate
 154 upholding of Indigenous Peoples'
 155 knowledge, beliefs, cosmogonies and values,
 156 including the right of Indigenous Peoples to
 157 withhold their knowledge and question the
 158 motives behind its use. In this context, the
 159 respect of free, prior and informed consent
 160 (FPIC) processes must be ensured as per
 161 the 2007 UN Declaration on the Rights to
 162 Indigenous Peoples (UNDRIP).

163 Actions on commitments made at the
 164 UNFSS must follow the lead of existing
 165 science–policy processes to live up to its
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legacy as the 'People's Summit', especially to ensure that the same mistakes as previous attempts to 'revolutionize' food systems are not repeated. It is possible to realize the ambitions of healthy, sustainable, equitable and resilient food systems transformations — but to do so requires a rethinking of what we value as knowledge, and more critically who's knowledge we value. □

The Global-Hub on Indigenous Peoples' Food Systems

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Competing interests

The authors declare no competing interests.

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