Building a WEF Nexus Community of Practice (NCoP)

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Abstract

Purpose of review: The goal of this paper is to examine the literature for common threads and attributes inherent to scientifically-based communities of practice, and to identify challenges and potential solutions for overcoming barriers in building an international community of scientists to address the water-energy-food nexus.

Recent findings: The latest research suggests several guiding principles to build and maintain a successful scientific community of practice. These include: identifying a shared conceptual vision that is clear in purpose, but also provides for evolution and growth; providing for both internal and external perspectives as well as various levels of participation among members; and facilitating activity among community members through collaboration that satisfies the individual member professional motivations.

Summary: There are several challenges involved in building and maintaining a sustainable water-energy-food nexus community of practice. Perhaps most difficult to overcome is the lack of a clear definition, meaning, and identity of the 'water-energy-food nexus'. While international collaboration among researchers will provide critical perspective and insight for addressing similar challenges on a more localized basis, the variation in regional jurisdiction and political realities could restrict international collaborative research and implementation of potential solutions.

Introduction

A "community of practice" (CoP) refers to a group of people engaged in a shared craft or profession. It signifies a way of knowing and learning with focus on people who exchange knowledge and practices to solve a specific set of problems. Wenger (2011) defined a CoP as a group of people who share concern or passion for what they do and who learn how to do it better through regular interaction. Its members share a common domain of interest, and the CoP renews itself by generating new knowledge (Wenger and Snyder 2000). The CoP concept is not new: for decades, the CoP model has been employed by private and public organizations, social sciences, education, and among national and international government entities. Technological advances in social media and digital communications have only expanded this concept as a platform to assuage geographic and funding limitations that have traditionally stifled sustainable collaborations and working relationships among national and international practitioners.

Mohtar and Lawton (2016) argue for the establishment of an online *Water-Energy-Food Nexus Community of Practice (WEF NCoP)* as a platform to enable transdisciplinary and transnational collaboration of WEF research and solutions involving academia, government, private industry, scientists, policy makers, and stakeholders. Their vision is to "develop a global science-policy platform for sharing data, knowledge, and best practices. The WEF platform would define data gaps and develop a common accounting framework for the nexus, while the CoP could help monitor the effectiveness of

the nexus governance by offering good governance models." Furthermore, Mohtar and Lawton suggest the WEF NCoP take the lead "in identifying and addressing the significant knowledge gaps that exist in science, education, and governance of the nexus." The NCoP would initiate and facilitate integrated research efforts, share experiences and perspectives for common WEF nexus challenges, and provide education and outreach to address local issues. "Just as nexus solutions applied locally will transcend regional and national borders, so should they promote interdisciplinary cooperation and inclusive, transparent approaches among all stakeholders" (Mohtar and Lawford 2016).

Advancement of internet applications has provided for global connectivity, discussion, and relationship building that transcends geographic and cultural differences. However, the literature suggests several critical attributes necessary for sustainable CoPs. Wenger 2011 suggested three critical characteristics crucial to the existence of a CoP. 1) a CoP includes a **shared domain** of interest that contains a common but distinctive focus, commitment and competence among its members: the WEF domain is one of inherent complexity and is likely to involve individuals of diverse subject matter expertise and geopolitical realities that stretch the boundaries of conventional CoP frameworks. 2) As individual members negotiate this domain, a **community** enables engagement in joint activity, projects, and discussions that build professional relationships that are mutually beneficial to individuals and the CoP at large. Li et al. (2009) stress the importance of fostering a balance between facilitating personal growth among individual members while at the same time adhering to the greater goals of the community. 3) The community must involve **practice** – a shared repertoire of artifacts or resources such as new methodologies for solving technical challenges, tools, research, and synergies that transcend geographical and cultural boundaries and limitations, but also address CoP members' local realities, and that satisfy personal and professional expectations. In discussing transdisciplinary research, Lang et al. (2012) cites Scholtz (2011) who emphasizes the importance of focusing on societally relevant problems, enabling mutual learning processes among researchers from different disciplines, and aiming to create knowledge that is solution-oriented, socially robust, and transferable to both the scientific and societal practice.

Wegner et al. (2002) developed seven principles for designing and cultivating a community of practice:
1) *Design for evolution* – CoPs are dynamic and often founded on pre-existing networks. Though CoPs should have a guiding vision and purpose, they should also foster growth and provide flexibility as the needs of the community change.
2) *Open a dialogue between inside and outside perspectives* – While community insiders have a more intimate understanding of the foundational principles and vision of the community, those outside the community can act as agents of change by offering new perspectives or approaches.
3) *Invite different levels of participation* – There typically exists a small core of community members who are highly motivated and involved in steering community values and efforts. The CoP should also accommodate those less involved who also wish to contribute to the mission of the community.
4) *Develop both public and private spaces* – Communities should have sufficient activity and offer opportunities to cultivate professional relationships among its members.
5) *Focus on value* – As members engage in collaboration, networking, and problem-solving, the value of the community at large and individually will form and evolve.

6) *Combine familiarity and excitement* - Communities should be places where members feel comfortable to share ideas, free from personal ridicule or judgement. The community must provide for free exchange and novel approaches to encourage member engagement, interest, and excitement.

7) *Create rhythm for the community* – Communities should guard against complacency and lethargy by maintaining a consistent level of activity that involves both community insiders and those on the periphery. The community must strike a balance between moving too quickly and becoming stagnant.

In their review of Wenger (1998), Amin and Roberts (2006) summarized other elements common to a successful community of practice. These include "sustained mutual relationships, shared ways of engaging in doing things together, the rapid flow of information and propagation of innovation, absence of introductory preambles, rapid setup of a problem to be discussed, substantial overlap in participants' description of who belongs, knowing what others know, what they can do, and how they can contribute to an enterprise, mutually defining identities, the ability to assess the appropriateness of actions and products, specific tools, representations, and other artefacts."

Key Challenges/Research Questions

Challenges of transdisciplinary research … from Lang et al. 2012.
  i. Lack of problem awareness or insufficient problem framing
  ii. Unbalanced problem ownership
  iii. Conflicting methodological standards
  iv. Lack of integration across knowledge types, organizational structures, communicative styles, or technical aspects
  v. Discontinuous participation
  vi. Vagueness and ambiguity of results
  vii. Fear to fail
  viii. Limited case-specific solution options
  ix. Lack of legitimacy of transdisciplinary outcomes
  x. Capitalizing on distorted research results
  xi. Tracking scientific and societal impacts

Following are some important challenges to initiating and sustaining a WEF NCoP …
  a. *Branding* – Who will sponsor the NCoP platform?
  b. *Hosting and maintenance* – Who will host the platform and resolve technical issues?
  c. *Recruitment* – Who will be invited to participate and provide leadership for different efforts? "In addition to the geographical distribution, community members belong to different organizations and cultures; have a different native language etc. This complicates meetings as well as the distribution of findings. On the other hand, the existence of technical communication and cooperation infrastructures allows increasingly global involvement of institutions and researchers in scientific communities (Birnholtz and Bietz 2003)." (Kienle and Wessner 2005)
  d. *Accessibility* – How to ensure that the NCoP platform and its features are compatible with existing internet access technology and applications for international users.

e. *Engagement* – How to meet the personal and professional needs of core members while, at the same time, attracting new expertise. "Regarding size, it would appear that there is an optimum size for the proactive community: if too small, there are insufficient active members to cover the range of issues to be discussed; if too large, people lose interest as activities become less relevant to their interests." (Mohtar and Lawford 2016) "Given the regional nature of WEF issues, there would be value in developing a few of these communities at the national level as well as one at the global level." (Mohtar and Lawford 2016) Per Wenger (2000), other boundary processes include key individuals purposely acting as brokers between the inside and outside of a community, boundary interactions between individuals from separate communities, and cross-disciplinary projects. Encounters with different perspectives achieved through boundary processes can lead to the reflection required to change one's own perspective, or to develop fresh insights. Consequently, the intersections between CoPs may offer valuable sources of new knowledge-creating capacity." (Amin and Roberts 2006). Size (based on geography or use engagement).

f. *Transdisciplinary interaction* – How to prevent silos forming among members? Amin and Roberts (2006) suggest that "from an organizational perspective whether knowledge is held in silos or able to move easily around the organization will influence the level of innovation arising from the cross-fertilization of ideas."

g. *Measures of progress* – What metrics will be used to evaluate participation, interest, and impact?

h. *Relevance across spatial scales* – How to encourage cross-disciplinary applications, solutions, approaches, transboundary? "They suggest that CoPs that cross formal boundaries can bring together practitioners facing common challenges to learn from each other, to develop new solutions to problems, to find synergies across organizations, and to coordinate efforts." (In Amin and Roberts 2006 citing (Snyder and Wenger 2003).

i. *Governance* – Who will take the lead to moderate discussions, facilitate collaborative research, and maintain focus within the CoP activity? "During the early stages, a small executive that involves key stakeholders proves helpful in defining and motivating specific studies and initiatives. This executive is designed to be a facilitative and advisory mechanism rather than fulfilling a management role." (Mohtar and Lawford 2016)

Data/Knowledge Gaps

Potential Transformative Solutions Needing More Research

- Host platform (what works best for the needs of the community?)
- What is the most effective governance/management structure?
- What is the shared goal of the community and what are specific objectives (at least initially)?
- How will the community sustain itself long-term (in terms of platform support, maintain engagement among key members, and facilitate transdisciplinary and international cooperation)?

"For example, in one study of why a managed online experiment, involving 20 librarians from different backgrounds in a discussion of knowledge management issues, was 'slow and grudging' (Cox, Patrick and Abdullah, 2003) blames seven factors: (a) lack of time for the community to form; (b) insufficient critical mass; (c) excessive diversity within a group in which members did not know each other; (d) lack of a tangible or clear enough focus; (e) limited incentive to participate; (f) lack of time set aside by participant organizations for the members to participate in the group." (Amin and Roberts 2006). "In these studies, it is the anthropology of communication, contact, and purpose that emerges as a significant influence on learning capability in online networks." "In virtual networks, there are clear limits to the depth and quality of trust that can be built …"

Impacts on Science and Society

"The WEF NCoP can help develop a global science-policy platform for sharing data, knowledge, and best practices. The WEF platform would define data gaps and develop a common accounting framework for the nexus, while the CoP could help monitor the effectiveness of nexus governance by offering good governance models (Mohtar and Lawford 2016)."

Conclusions

"This paper concludes with a call for a WEF nexus community of practice (NCoP) to promote and enable an integrative approach to develop and employ tools with the purpose of strengthening sustainable food security, increasing energy production, and bridging water supply gaps that have arisen in demands for both food and energy. The transdisciplinary platform created by the NCoP will carry strong societal impact while addressing the scarcity and sustainable management of these primary resources. (Mohtar and Lawford, 2016)."

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