Evaluating Extra-Organizational Communities of Practice

by

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Institute of Health Policy, Management & Evaluation
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Abstract

A community of practice (CoP) is a group of people who work together on an ongoing basis and share knowledge and expertise about common practices, problems, or topics. CoPs are increasingly being acknowledged as critical components in sectors such as health care and business management. Although the potential for CoPs to promote learning, knowledge mobilization, and other benefits is recognized, limited research exists on evaluating CoPs and little agreement is evident on approaches to evaluating CoPs. In particular, there is a scarcity of research and evaluation on extra-organizational CoPs. This dissertation starts with a scoping review of evaluation frameworks for CoPs, describing 16 evaluation frameworks and how they were applied or tested. These frameworks were not fully applicable to extra-organizational CoPs; hence, the impetus for the second study, which was to develop an evaluation framework adapted to this type of CoP. The proposed framework guides evaluators to systematically consider the types of value generated by extra-organizational CoPs and the level of analysis at which value occurs. The dissertation proceeds to assess the applicability of the proposed evaluation framework using qualitative interviews with an extra-organizational community of practice.
(CoPEH-Canada). The findings show that the evaluation framework proved to be comprehensive as a tool for collecting and analyzing data and framing results. The findings from the application of the framework were used to refine the framework and to better understand the potential value generated by extra-organizational CoPs. This dissertation has practical applications for evaluators, CoP members and other stakeholders; it makes a methodological contribution through the development and refinement of an evaluation framework; and it makes a theoretical contribution by expanding knowledge of extra-organizational CoPs and how they could be evaluated.
Acknowledgments

I owe many thanks for the support I received while completing this dissertation. I was lucky to have two excellent co-supervisors to guide me through this process. I am grateful for the guidance and support of my supervisors, Dr. Rhonda Cockerill and Dr. Donald Cole. I learned so much from both of you, through our discussions, and also your modeling of reliable, responsive and caring supervisors. Rhonda, thank you for advice in navigating this doctoral program and always having an open door. Donald, thank you for the encouragement, direction and mentorship. I would also like to thank my committee members Dr. Whitney Berta and Dr. Johanne Saint-Charles for their thoughtful feedback, questions and encouragement throughout. Thank you to Janet Irvine, Mary Anne Nixon and Ed Warlow for their editing support.

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Thank you to the friends I made in this program. I hear that completing a PhD can be an isolating journey, but thanks to them it was, at least partially, fun filled. They were a huge source of professional and personal support. I am lucky to have met you first year and to have maintained our friendship through to celebrating the completion of our degrees and beyond. Thanks to my partner, Jason for his support throughout, even though for the first half of my degree he told people I was studying communities of penguins. Thanks to my family who have always been loving and supportive, I couldn’t have done this without you.
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Chapter 1
Introduction

1
1.1 Introduction and Problem Statement

Communities of Practice (CoPs) are groups of people who interact on an ongoing basis to share knowledge and expertise about common practices, problems, or topics (Wenger, McDermott, & Snyder, 2002). There has been an emergence of collaborative initiatives, in general, and an interest in CoPs in particular, due to their potential role in learning and knowledge generation (Amin & Roberts, 2008). Sectors including health care, education and business are increasingly considering CoPs as part of their field. Some CoPs bring together individuals from within an organization, and others link people from across organizations in extra-organizational CoPs where individuals act as representatives of their organization or independently of their organizational affiliations. Extra-organizational CoPs include relationships between individuals who may or may not be a part of an organization.

CoPs may evolve naturally, although they are also intentionally employed as knowledge management tools (Cox, 2005; Li et al., 2009a; Wenger, 2004), and offer a way to structure collaboration in response to the challenges of complex problems. CoPs can provide opportunities to break down professional and organizational barriers (Ranmuthugala, Plumb, et al., 2011) and to support the learning of newcomers to a field (Lave & Wenger, 1991). They can offer a way to translate and share tacit knowledge or ‘know how,’ as a valuable resource for capacity building and implementing evidence-based practices (Barwick, Peters, & Boydell, 2009; Wenger, 1998b). Extra-organizational CoPs can have a role in knowledge creation and transfer (Roberts, 2006).

Of note, CoPs are being applied in the health sector. Organizations such as Cancer Care Ontario (Kitto, Grant, Peller, Moulton, & Gallinger, 2018), Canadian Partnership Against Cancer (Bentley, Browman, & Poole, 2010), Ontario Ministry of Health and Long Term Care (Conklin, Lusk, Harris, & Stolee, 2013), UK National Health Service Trust (Kislov, Harvey, & Walshe, 2011) and International Development Research Centre (Brisbois et al., 2017) are cultivating or funding CoPs. The goals of these CoPs include quality improvement in healthcare (e.g., Bentley et al., 2010; Kislov et al., 2011), and knowledge translation (to improve health practice) (e.g.,
Kothari, Boyko, Conklin, Stolee, & Sibbald, 2015). Ultimately, these CoPs are supported because they offer an upstream approach to improving the health of the population. Many organizations that are looking to initiate CoPs are keen to know what can be done to support their success; systematic study of CoPs through evaluations can help to support this. In acknowledging the investment of financial resources and time commitments that go in to CoPs, evaluations can also help from an accountability standpoint.

Despite the growing interest in and implementation of CoPs, there has been limited evaluation of them (Bertone et al., 2013; Li et al., 2009b) and little agreement on approaches to evaluating their influence (Li et al., 2009b). In particular, there is a dearth of evaluation research and evaluation of extra-organizational CoPs relative to intra-organizational CoPs. As a result, empirical evidence supporting the effectiveness of CoPs remains limited, as does evidence regarding how they might generate value. Because the work and learning of extra-organizational CoPs occurs outside of an organization, the value of these CoPs may go unrecognized, and the work of individual members may not be acknowledged.

The current emphasis on partnerships, collaboration, and networks has stimulated interest in new concepts, methodologies, and techniques to understand the mechanisms and the potential value of CoPs. Greater evaluation of CoPs is an important step towards understanding how they work and how they could be more effective, documenting their value, and promoting their sustainability (Wenger et al., 2002). Evaluation can help programs or organizations to be more strategic and deliberate, to make a case for continued funding and support, and to build relationships with stakeholders (Carman, 2013). Yet there is a need for an evaluation framework that is suitable for the nature, context and goals of extra-organizational CoPs to assist in understanding how they work and how they can be more effective.

In embarking on an evaluation of an intervention, one place to start is to examine how others have evaluated similar interventions. This approach may lead to applicable approaches or validated tools. While it may not be possible to find a suitable evaluation framework, these frameworks may still provide ideas or guidance that may be helpful in addressing the evaluation questions one is seeking to address. Additionally, working with or building off other frameworks may provide the opportunity to compare interventions and build knowledge about how the intervention works.
An evaluation framework describes an overall approach or design that guides an evaluation. Evaluation frameworks provide a summary of which themes, components, mechanisms, contexts or outcomes to include in an evaluation. They can be helpful in bringing a systematic approach or allowing for comparative work. Evaluation frameworks may be based on different evaluation approaches (formative, summative), address different evaluation priorities, have different ways of defining success, or explore different factors contributing to successes and challenges. Therefore, one must ensure that an evaluation framework is appropriate for application to a particular intervention in a particular setting. In developing a new evaluation framework, demonstrating the applicability and refining the framework though application and reflection on the process can improve it and promote its use, thereby allowing for comparison, synthesizing evaluations and greater learning from evaluations.

This dissertation investigates and advances the evaluation of CoPs, with attention to extra-organizational CoPs. This is accomplished by reviewing how CoPs and knowledge networks are being evaluated, by developing a framework to guide evaluations of extra-organizational CoPs, and finally, by applying the evaluation framework in a qualitative study with an extra-organizational CoP in order to refine the framework.

1.2 Objectives and Research Questions

The overarching question that will be addressed in this dissertation research is: How can CoPs be evaluated in a way that informs the value they generate and how they work? The broad aims of the proposed research are to develop and apply a framework to evaluate extra-organizational communities of practice and, in the process, to build an understanding of extra-organizational communities of practice. Four specific guiding questions shape this research; each question answered in the scientific papers identified in parentheses.

i) What frameworks have been used or proposed for the evaluation of CoPs and knowledge networks? (Paper 1, presented in Chapter 3)

ii) What is an appropriate evaluation framework to support the evaluation of extra-organizational CoPs? (Paper 2, presented in Chapter 4)

iii) How well do the dimensions of the proposed evaluation framework help to capture the value created by extra-organizational CoPs? (Paper 3, presented in Chapter 5)
iv) What value do extra-organizational CoPs generate, particularly at the individual and collective levels? (Paper 3, presented in Chapter 5)

1.3 Research Approach

Table 1.1 outlines the research questions and aims of each chapter and the associated methods used to address them. The three studies are designed sequentially, where the findings and future research of each study informs the research question and approach of the next (described in detail in the Discussion Chapter, Section 6.2.4).

Table 1.1 Overview of research questions, aims and methods

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Research Question</th>
<th>Aim</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>• What frameworks have been used or proposed for the evaluation of CoPs and knowledge networks?</td>
<td>• Identify frameworks used or proposed for CoPs or knowledge networks. • Summarize purpose, components and extent to which frameworks have been applied or tested.</td>
<td>• Systematic scoping review of evaluation frameworks used or proposed for CoPs or knowledge networks. • Description of findings including purpose, main components, common evaluation components/approaches and application/testing of evaluation frameworks.</td>
</tr>
<tr>
<td>4</td>
<td>• What is an appropriate evaluation framework to support the evaluation of extra-organizational CoPs?</td>
<td>• To develop an evaluation framework, based in CoP theory that would be suitable for the evaluation of extra-organizational CoPs.</td>
<td>• Review of literature to understand organizational setting and a typology for CoPs. Discussion of importance of this setting in evaluating CoPs. • Critical review of levels of analysis used in evaluation frameworks for CoPs • Alignment of levels of analysis and types of value based on literature review and experience working within CoPs.</td>
</tr>
</tbody>
</table>
| 5 | • How well do the dimensions of the Evaluation Framework help to capture the value created by extra-organizational CoPs?  
• What value do extra-organizational CoPs generate, particularly at the individual and collective levels?  
• To assess the applicability of the evaluation framework, developed in Paper 2, for extra-organizational CoPs  
• To learn about the case CoP with respect to value generated  
• Single case study collecting data through qualitative interviews and using deductive content analysis to analyze. Evaluation framework informed data collection, analysis and presentation of results. |

Throughout the dissertation we consider CoPs in ecosystem approaches to health (CoPEHs) and the Canadian Communities of Practice in Ecosystem Approaches to Health (CoPEH-Canada) in particular. CoPEHs are an example of extra-organizational CoPs that are interested in self-evaluation, thus providing an opportunity to explore the application of evaluation frameworks. CoPEHs are groups of individuals (many with organizational and institutional connections) who are committed to the field of ecohealth. An ecosystem approach to health (ecohealth) “recognizes that health and well-being are the result of complex and dynamic interactions between determinants, and between people, social and economic conditions, and ecosystems.”(Charron, 2012c, p. 7).CoPEH-Canada is one of several networks and CoPs in ecohealth (Parkes et al., 2012). CoPEH-Canada Canada is a network and community of scholars and practitioners from across Canada that was established in 2008 for the development and dissemination of ecohealth ideas and practices.

Paper 1 used a systematic scoping review to identify and summarize evaluation frameworks used or proposed from communities of practice and knowledge networks. The search strategy aimed to be inclusive, looking for peer-reviewed articles, conference proceedings, and reports published after 1991¹. The screening process did not exclude frameworks based on study quality, as the goal was not to assess quality, but to describe frameworks that had been proposed. The search

1 The year of publication of Lave and Wenger’s (1991) book Situated learning: Legitimate peripheral participation in which the term “community of practice” was first used.
strategy used a systematic approach, but did not conduct steps in duplication due to feasibility constraints. In describing the evaluation frameworks, it was noted that the majority stemmed from CoPs within organizations. In examining the potential applicability of the framework, the discussion was grounded by considering CoPs and networks in ecosystem approaches to health (ecohealth) as a way demonstrating the considerations an evaluator or CoP member might use in determining relevance and selecting a framework. While the proposed frameworks were informative, there was not one that was fully appropriate for CoPs and networks in ecohealth.

Paper 2 starts with a review of additional literature to understand organizational settings and develop a typology for CoPs. It then goes on to provide a more critical review of levels of analysis and types of value used in evaluation frameworks for CoPs. The central contribution is proposing a framework to help guide evaluations of extra-organizational CoPs. The development of the framework involved the collection and analysis of information gathered from a review of empirical research on CoPs, a scoping review of evaluation frameworks for CoPs and knowledge networks (Paper 1), consultations with CoP members interested in self-evaluation and insights from the authors’ participation in CoPs. As CoPs are largely dynamic and complex, the aim was not to create a framework limited to summative judgments but rather to ensure it was also supportive of multiple approaches to evaluation, including formative evaluations. Paper 2 is a conceptual paper with the aim of proposing an evaluation framework with broad applicability to all extra-organizational CoPs; as such we step away from CoPs in ecohealth.

Finally, Paper 3 is the application of the framework proposed in Paper 2 through a qualitative study. While the evaluation framework can be applied in several ways, a qualitative approach offers opportunities to illuminate the value generated by CoPs, while contributing to an assessment of the evaluation framework’s applicability. Data was collected through qualitative interviews with members of Canadian Community of Practice in Ecosystem Approaches to Health (CoPEH-Canada) an example of an extra-organizational CoP. Deductive content analysis was used to analyze the data. The evaluation framework informed data collection, analysis and presentation of results.

1.4 Organization of the Dissertation

This dissertation presents three distinct and sequential studies that are presented in self-contained Chapters (Chapters 3-6) that address the above research questions. Chapter 2 reviews literature
that provides context for understanding CoPs of practice and evaluation, and highlights gaps in the extant literature. Chapter 3 presents the results of the systematic scoping review of evaluation frameworks for CoPs and knowledge networks. This chapter has been published as a manuscript in *EcoHealth* and is referenced in other chapters of the dissertation as McKellar, Pitzul, Yi, and Cole (2014). Chapter 4 presents an evaluation framework suitable for extra-organizational CoPs. At the time of writing, this chapter was submitted to *Evaluation* and is referenced as McKellar et al. (under review). Chapter 5 presents the results of the application of the evaluation framework with the Canadian Community of Practice in Ecosystems Approaches to Health (CoPEH-Canada) through a qualitative study. This chapter was submitted to *The Canadian Journal of Evaluation*. Chapter 6 summarizes the main results of the three studies, draws additional links between the individual manuscripts, and discusses their practical implications, and methodological and theoretical contributions. It outlines strengths and limitations of the dissertation, as well as potential areas for future research and evaluation.
Chapter 2
Literature Review

2

2.1 Overview

This literature review explores two literatures in order to provide context for the three papers (Chapters 3-5). First, it provides an overview of the community of practice literature with definitions of key concepts, summarizes the state of the literature, and draws attention to important theories that should inform CoP evaluation. Next, it moves to the evaluation literature and presents an overview of evaluation purposes and approaches. Additional reviews of the literature can be found within Chapters 3-5 and in the appendices, providing greater detail on topics such as evaluation frameworks (Chapters 3 and 4), organizational settings of CoPs (Chapter 4), and ecosystem approaches to health (Chapters 3 and 5, and Appendix A).

2.2 Communities of Practice

2.2.1 Definition

CoPs are groups of people who interact on an ongoing basis to share knowledge and expertise about common practices, problems, or topics (Wenger et al., 2002). CoPs are bound by their shared activities and what they have learned through their mutual engagement (Wenger, 1998a). CoPs need not refer to themselves as such, be reified in the discourse of their participants, or be formalized; instead, there must be an agreed-upon joint practice (e.g., something that they are trying to accomplish). A helpful description that highlights the learning theory and the groups of people that comprise communities of practice (and aligns with the definition of a CoP in this dissertation) was provided by (Koliba & Gajda, 2009) citing Snyder, Wenger, and de Sousa Briggs (2003): CoPs “operate as ‘social learning systems’ where practitioners connect to solve problems, share ideas, set standards, build tools, and develop relationships with peer and stakeholders . . . [They] feature peer-to-peer collaborative activities to build member skills and steward the knowledge assets of organizations and society” (p. 17).
2.2.2 Dimensions of communities of practice

While there are many ideas presented as part of CoP theory (explored in Section 2.2.6), three dimensions of CoPs are commonly used to define them. Presented as a source of coherence of a community, these were initially described as mutual engagement, joint enterprise, and shared repertoire, (Wenger, 1998b, pp. 72-84). The mutual engagement represents the participants who interact to learn and build meaning while engendering a sense of belonging. This answers ‘How does it function?’ (Wenger, 1998a). The joint enterprise can be understood as a common ground for CoP members, inspiring participation and guiding learning. This answers ‘What is it about?’ (Wenger, 1998a). The shared repertoire is a body of common and collective knowledge and resources developed over time as a concrete form of practice. The shared repertoire is a resource for negotiating meaning (Wenger, 1998b) in the form of ideas, tools, documents, or stories, which together define practice. This answers ‘What capability has it produced?’ (Wenger, 1998a), and also represents what the CoP can draw upon to inform and sustain itself.

Wenger (1998b) provides a list of indicators that a community of practice has formed (see Table 2.1). The elements that are aligned with each indicator have been added to improve clarity. Wenger’s original list was not categorized by the CoP dimension, although several others have also categorized this set of indicators in various ways, according to the dimensions (e.g., Agrifoglio, 2015; Li et al., 2009a).
Table 2.1 Indicators of a community of practice

<table>
<thead>
<tr>
<th>Indicators of a community of practice</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Sustained mutual relationships - harmonious or conflictual</td>
<td>Mutual engagement</td>
</tr>
<tr>
<td>2) Shared ways of engaging in doing things together</td>
<td>Mutual engagement</td>
</tr>
<tr>
<td></td>
<td>Shared repertoire</td>
</tr>
<tr>
<td>3) The rapid flow of information and propagation of innovation</td>
<td>Mutual engagement</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Absence of introductory preambles, as if conversations and interactions were merely the continuation of an ongoing process</td>
<td>Mutual engagement</td>
</tr>
<tr>
<td></td>
<td>Shared repertoire</td>
</tr>
<tr>
<td>5) Very quick setup of a problem to be discussed</td>
<td>Mutual engagement</td>
</tr>
<tr>
<td></td>
<td>Shared repertoire</td>
</tr>
<tr>
<td>6) Substantial overlap in participants' descriptions of who belongs</td>
<td>Mutual engagement</td>
</tr>
<tr>
<td>7) Knowing what others know, what they can do and how they can contribute to an enterprise</td>
<td>Mutual engagement</td>
</tr>
<tr>
<td></td>
<td>Joint enterprise</td>
</tr>
<tr>
<td>8) Mutually defining identities</td>
<td>Mutual engagement</td>
</tr>
<tr>
<td></td>
<td>Joint enterprise</td>
</tr>
<tr>
<td>10) Specific tools, representations and other artifacts</td>
<td>Shared repertoire</td>
</tr>
<tr>
<td>11) Local lore, shared stories, inside jokes, knowing laughter</td>
<td>Shared repertoire</td>
</tr>
<tr>
<td></td>
<td>Mutual engagement</td>
</tr>
<tr>
<td>12) Jargon and shortcuts to communication as well as the ease of producing new ones</td>
<td>Mutual engagement</td>
</tr>
<tr>
<td></td>
<td>Shared repertoire</td>
</tr>
<tr>
<td>13) Certain styles recognized as displaying membership</td>
<td>Mutual engagement</td>
</tr>
<tr>
<td></td>
<td>Shared repertoire</td>
</tr>
<tr>
<td>14) A shared discourse reflecting a certain perspective on the world</td>
<td>Mutual engagement</td>
</tr>
<tr>
<td></td>
<td>Shared repertoire</td>
</tr>
<tr>
<td></td>
<td>Joint enterprise</td>
</tr>
</tbody>
</table>

Adapted from (Wenger, 1998b, pp. 125-126)
In his third book, *Cultivating Communities of Practice*, Wenger et al. (2002) defined CoPs with three different structural elements, although they overlap with the dimension set out in his 1998 book (Wenger, 1998b). Li et al. (2009a) suggest the change was made to better enable CoPs to be used as management tools. In this reformulation, Wenger et al. (2002), suggests that although quite varied, CoPs share a basic structure of the following three elements: *domain*, *community*, and *practice*. These three elements represent mutually reinforcing aspects of participation that motivate people to engage with a CoP (Wenger et al., 2002). *Domain* refers to the topics or issues that drive the CoP, that is, the subject of the passion of CoPs. The domain is the source of inspiration and motivation for participants that creates a sense of common identity. The *community* reflects the people of the CoP and their relationships within it. The *practice* is what develops over time with sustained interactions in a domain (Wenger et al., 2002, p45-46). Each of the elements is dynamic as CoPs change with time.

There is substantial overlap between these two sets of defining dimensions/elements (mutual engagement and community, joint enterprise and domain, shared repertoire and practice). They are not in all respects the same; for example, mutual engagement is more of a process while community is more of a state. Both sets of constituent elements are outlined here, as both are used throughout CoP literature, with domain, community, and practice being more common in recent years. In this dissertation, both sets of terms are used to define CoPs, and findings are related back to these dimensions/elements to clarify concepts and understand their applicability to CoPs.

### 2.2.3 Community of practice vis-à-vis other groups

Many forms of groups or networks share characteristics with CoPs. The term *network* describes “the relationships that exist between groups of individuals or agencies, and the resources to which membership of such groups facilitates access” (Hawe, Webster, & Shiell, 2004, p. 971). The term is also used in a non-specific way in the literature to refer to a partnership, alliance or group (Hawe et al., 2004). A social network is “a set of socially relevant nodes (e.g., people) connected by one or more relations” (Marin & Wellman, 2011, p. 11). Authors have proposed the notions of “knowledge networks” and “networks of practice”; these two notions, or types of network, are relevant to understanding CoPs, as there is overlap as to how the concepts,
structures and activities can be viewed. A knowledge network is understood as a network of social relationships (be they close or just loose associations) in which information is collected and shared (Allee, 2000). CoPs are similar in that, they too, include a set of social relations, but they also have a shared identity related to subject matter or common practice. A knowledge network might be the closest network form to a CoP, although the network of practice concept is also similar. The latter are defined as larger, loosely knit, geographically distributed groups of individuals engaged in a shared practice, but who may not know each other nor necessarily expect to meet face-to-face (Brown & Duguid, 2001). While this dissertation focuses on CoPs, it does include special consideration of knowledge networks in the systematic scoping review (Chapter 3/Paper 1) so that the review could be more inclusive of evaluation frameworks that may be useful to CoPs.

The original view from Lave and Wenger (1991) more closely aligns with the concept of networks. Lave and Wenger’s (1991) definition of a community of practice as “a system of relationships between people, activities, and the world, over time and in relation to other tangential and overlapping communities of practice” (p. 98) may have led some authors to suggest that the difference between other forms of networks and CoPs is merely a matter of terminology (e.g., Creech, Laurie, Paas, & Parry, 2012). Wenger et al. (2011, p. 9) suggest that CoPs and networks represent “two aspects of the social fabric of learning”; the network aspect is about a set of relationships, while the community is about shared identity around a topic. Although overlap with other types of networks, such as epistemic communities (Haas 1992), practice-based networks, and service delivery networks might occur, CoPs’ uniqueness can be attributed to multiple factors. While some suggest it is the defining dimensions or elements described above in Section 2.2.2, others assert it is a matter of shared identity (McDermott, 1999; Verburg & Andriessen, 2006). Thomson proposes a distinguishing factor of the interrelationship of the above three factors, described as a *virtuous circle*, that is, “where the more people participate, the more they learn, and the more they identify with and become prominent within a group, becoming more motivated to participate even further, and so on” (Thompson, 2005, p. 152).
2.2.4 Communities of practice as interventions

Sectors such as health care, education, and business have increasingly been considering CoPs as an integral part of their field. While CoPs may evolve naturally, they are also intentionally employed as knowledge management tools (Cox, 2005; Li et al., 2009a; Wenger, 2004), or as a strategy for system change and professional development (Koliba & Gajda, 2009). The current emphasis on partnership, collaboration, and networks (CoPs being one model), has stimulated interest in new concepts, methodologies, and techniques to understand the mechanisms and determine the potential value of CoPs. CoPs are increasingly common in organizations (Kerno Jr, 2008) and within management practice (Roberts, 2006), with the view that they can support knowledge transfer and knowledge creation (Brown & Duguid, 1991; Wenger, 1998b) and be leveraged for strategic advantage (Wenger et al., 2002).

Three systematic reviews have been conducted to describe CoPs in business and healthcare (Li et al., 2009b), in healthcare only (Ranmuthugala, Plumb, et al., 2011) and in public health (Barbour, Armstrong, Condron, & Palermo, 2018). From these reviews we see that CoPs in business and healthcare (and the use of the term in the literature) began to surface in the late 1990s, but grew after that (Li et al., 2009b; Ranmuthugala, Plumb, et al., 2011). These three reviews provide a sense of primary studies of CoPs in the literature (n=31, 31, 10 respectively), however, these numbers are not reflective of the number of communities of practice that are being initiated, supported, or cultivated. In Cultivating Communities of Practice by Wenger et al. (2002), the focus shifted to more of a manual of inspirational text, which may have contributed to a proliferation of the instrumentalist application of CoPs. Wenger et al. (2002) begin by describing the value of communities of practice to their organizations and the potential of social structures as management tools. They provide principles for cultivating CoPs, and offer suggestions in planning, launching, growing and sustaining CoPs. Additionally, they discuss measuring and managing value creation of CoPs.

Much of the literature on CoPs communicates a favourable view with many potential benefits. The interest in CoPs lies in the potential role in learning and knowledge generation (Amin & Roberts, 2008), often for the organization in which they are initiated or exist, although there are other benefits for members, the CoPs themselves, and stakeholders outside of the CoP. CoPs can
provide opportunities to break down professional and organizational barriers (Ranmuthugala, Plumb, et al., 2011) and to support the learning of newcomers to a field (Lave & Wenger, 1991). They can offer a way to translate and share tacit knowledge or ‘know how,’ as a valuable resource for capacity building and implementing evidence-based practices (Barwick et al., 2009; Wenger, 1998b). CoPs can also be a source of practical guidance (Brown & Duguid, 1991). In the healthcare field they have been proposed to support and improve the practice of health professionals (Ranmuthugala, Plumb, et al., 2011). For organizations, they can be a significant determinant of organizational resilience and other important outcomes (Braithwaite et al., 2009; Weick & Sutcliffe, 2007).

Communities of practice are not without weaknesses or associated risks. Perhaps not surprisingly, their potential limitations stem from the same qualities that can make them an ideal structure for learning (e.g., shared perspectives, communal identity, long-standing relationships, an established practice) (Wenger et al., 2002). Communities of practice may become static in terms of their knowledge base and therefore resistant to change. As described by Wenger et al. (2002) “in a tight community [of practice] a lot of implicit assumptions can go unquestioned, and there may be few opportunities or little willingness inside the community to challenge them” (p. 141). Power dynamics within a CoP as well as exclusivity in membership can similarly lead to stagnated learning. A close community without many peripheral members can make it difficult for newcomers to join and thus for new ideas to enter. Core members or full participants may be more powerful and dominate the negotiation of meaning (Roberts, 2006). Issues within a community of practice can relate to the relationship or view of the domain (Wenger et al., 2002). The sense of ownership of a domain can be so great as to not allow perspectives from others. If one considers oneself an expert, one may falsely believe they know all there is to know. A community’s sense of ownership over a domain may lead them to feel that they should be consulted by others working in that domain. Wenger et al. (2002) use the term imperialist communities to describe CoPs with these sorts of issues.

Despite the growing interest in, and implementation of CoPs, there has been limited evaluation of CoPs (Bertone et al., 2013; Li et al., 2009b) and little agreement on approaches to evaluating their influence (Li et al., 2009b). As a result, empirical evidence supporting the effectiveness of
CoPs remains limited. Among available studies, very few investigate the mechanisms that determine a CoP’s effectiveness (Li et al., 2009b).

2.2.5 Instrumental versus theoretical community of practice

Up until this point, this literature review has focused on CoPs as groups of people. This is the primary view taken in this dissertation, and the most common definition used in the literature. However, this is not the only view of a community of practice, which can also be viewed in a theoretical sense as a tool for analysis of social learning and practice. Another way of characterizing this dichotomy of uses is that CoPs have been used descriptively as an analytical framework, and prescriptively, as an organizational intervention (Koliba & Gajda, 2009). Both usages are prevalent in the literature and are important in understanding CoPs.

The concept of community of practice has been used, adapted and applied in many fields and settings and its usage has changed since the term was originally coined in 1991. Originally, when the term was first used by Lave and Wenger (1991), it did not necessarily imply a bounded, well-defined group as described by Wenger et al. (2002) (instrumental sense of CoP). Instead, CoP referred to an activity system in which individuals are united in their understanding of practice and its meaning for them and the community (Lave & Wenger, 1991) (theoretical sense of CoP). This dissertation deals with CoPs in both the conceptual-analytical sense and the instrumental-intervention sense, but focuses primarily on the latter. The conceptual sense is used to provide a theoretically based understanding of (instrumental) CoPs.

2.2.6 Key concepts in understanding communities of practice

In acknowledging the importance of CoPs as an analytical approach, the next section explores key concepts in CoPs. It describes the foundational notions of situated learning and legitimate peripheral participation, and then provides an overview of some of the theories and concepts that intersect with those of CoPs.
2.2.6.1 Foundational concepts

2.2.6.1.1 Situated learning

Situated learning theory, on which the concept of CoPs is based, argues that learning occurs in social situations in which individuals develop knowledge and skills by interacting with others who are skilled and can provide insights, usually in a context that involves the practical use of knowledge (Lave & Wenger, 1991). However, situated learning is not about observation and imitation. Situated learning, as discussed by Lave and Wenger (1991, p. 31), goes beyond “learning in situ” and “learning by doing”; it is the view that “learning is an integral and inseparable aspect of social practice.”

Situated learning theory critiques cognitivist theories of learning, questioning learning as a discreet and decontextualized activity (Handley, Sturdy, Fincham, & Clark, 2006). Instead, it describes learning as taking place within participation, not in an individual mind. Learning is therefore mediated by the multiple perspectives of CoP participants (Hanks, 1991). In situated learning theory, the community of practice is the context in which learning takes place. For communities of practice, situated learning refers to the general theory “…about the relational character of knowledge and learning, about the negotiated character of meaning and about the concerned (engaged, dilemma-driven) nature of learning activity for the people involved” (Lave & Wenger, 1991, p. 33). Lave and Wegner go on to note that there is therefore “no activity that is not situated” (p. 33), and thus learning is viewed as an aspect of all activity.

2.2.6.1.2 Legitimate peripheral participation

Lave and Wenger capture the idea of situated learning in another key concept for CoPs, legitimate peripheral participation, in that learning involves becoming a full participant or member of a CoP: “As an aspect of social practice, learning involves the whole person; it implies not only a relation to specific activities, but a relation to social communities – it implies becoming a full participant, a member, a kind of person” (Lave & Wenger, 1991, p. 53). Legitimate peripheral participation describes “engagement in social practice that entails learning as an integral constituent” (Lave & Wenger, 1991, p. 35). Legitimate peripheral participation is not solely about the individual, it “refers to both the development of knowledgeable skilled
identities in practice and to the reproduction and transformation of the communities of practice” (Lave & Wenger, 1991, p. 55). This highlights both the individual and collective consequence of learning.

Learning is about moving within a community and becoming a member through developing a shared understanding and acceptance. According to Lave and Wenger (1991), mastery of knowledge and skill requires movement towards full participant status. Legitimate peripheral participation is that movement, and it is precisely such movement that is synonymous with learning. Legitimate peripheral participation “characterizes the process by which newcomers become included in a community of practice” (Wenger, 1998b, p. 100). It describes the movement of a newcomer participant through learning and understanding of the language and expectations of the CoP, eventually gaining the level of expertise required to be a full participant (deChambeau, 2014, p. 40; Lave & Wenger, 1991). ‘Experts’ within a CoP tend to have “evolved their identity and meaning-making to fit within” the CoP, as expressed by Campbell, Verenikina, and Herrington (2009, p. 649).

Despite the idea of trajectory from “newcomer” to “old-timer”, Lave and Wenger (1991), suggested there are multiple, more or less engaged ways of participating in a CoP or field of knowing (Campbell et al., 2009), and that there is no centre or endpoint to participation. Newcomers exist at the periphery of the CoP, and the term ‘legitimate’ merely refers to the fact that they are an accepted member (Campbell et al., 2009). “To some extent “everyone’s participation is legitimately peripheral in some respect” (Lave & Wenger, 1991, p. 117) and therefore all actors within the community are moving along a trajectory of learning” (Campbell et al., 2009, p. 649). Understanding legitimate peripheral participation is relevant to understanding the multiple forms of CoP membership, the influence of members on a CoP, and a CoP’s influence on its members.

2.2.6.2 Intersecting theories or concepts

There are multiple theories of interest related to CoPs and knowledge networks. This section provides an overview of these intersecting theories and how they relate to CoPs.
2.2.6.2.1 Knowledge creation

Knowledge is commonly conceptualized in two forms, tacit knowledge (‘know how’) and explicit knowledge (‘know that’) (Polanyi, 1966; Ryle, 2009). CoPs share both types of knowledge (Brown & Duguid, 2001) and their advantage is often seen as facilitating tacit knowledge exchange (e.g. Buckley & Du Toit, 2010). Nonaka (1994) models knowledge transfer as a process in which existing knowledge can be in either form (i.e., tacit or explicit) and can be transformed into either tacit or explicit knowledge through processes of knowledge conversion. There are four models of knowledge creation/transfer: creating tacit knowledge through shared experience is referred to as socialization, creating explicit knowledge from explicit knowledge is referred to as combination, conversion of explicit knowledge to tacit knowledge is referred to as internalization, and the conversion of tacit to explicit knowledge is referred to as externalization.

Situated learning emphasizes what is referred to above as socialization, where learning comes from experiences and participation. A focus on internalization of knowledge is however, somewhat at odds with CoPs and legitimate peripheral participation, as it establishes a dichotomy of internal and external and allows the individual to be the unit of analysis.

2.2.6.2.2 Collective learning

Mittendorf et al. (2006) use Nonaka’s (1994, 1995) knowledge creation theory, specifically the externalization processes (from tacit to explicit knowledge), to define collective learning. However, Brown and Duguid (1991) describe learning as being socially constructed and distributed, where individual learning and collective learning are indistinguishable. Further, Brown and Duguid (1996) argue that tacit knowledge can only be externalized and spread through social interaction. This distinction between individual and collective learning informs Paper 2 (Chapter 4) as a background consideration to evaluation framework development. Within the community of practice the learning processes are collective but outcomes can be at the individual or collective level (De Laat & Simons, 2002).
2.2.6.2.3 Social learning

Lave & Wenger’s (1991) situated learning theory proposed that learning takes place in the context in which it is practiced, that learning is not solely a matter of internalizing knowledge but of participating in shared activity. Similarly, social learning theory describes learning in terms of the interrelations among behaviour, environmental factors, and personal factors (Bandura, 2004). Bandura (1977) described that much of human learning is developed through modelling, from observing others. Personal ability to construct reality based on interactions with others, to select coding information, and to utilize constant feedback are central to this social learning theory which can help in understanding CoPs by focusing on answering questions about how events shape the learning process of community participants. While both situated and social learning focus on social interactions and learning from others, situated learning highlights the transformation in individual and community identity. The emphasis of situated learning is on becoming rather than behaviour.

2.2.6.2.4 Motivation, sense of community and participation

Learning is connected to other factors important to CoPs including intrinsic motivation (Schmidt & Moust, 2000). Motivation and sense of community are two key factors in an individual’s participation in a CoP. Members’ motivation to participate in CoPs is directly related to the frequency of interaction within CoPs and is indirectly related to interaction quality (Zboralski, 2009). Nistor et al. (2014) relate participation in CoPs to an individual’s sense of community, which is then related to joint enterprise and mutual engagement. Sense of community—“a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together” (McMillan & Chavis, 1986)—is linked to participation, and notably, knowledge sharing within the CoP (Nistor et al. 2014).

2.2.6.2.5 Social capital

Social capital theory has been used to examine knowledge translation within networks (Inkpen & Tsang, 2005). The central idea is that networks and associated norms of reciprocity have value (Putnam, 2001). Social capital can be thought of as a set of resources that can help accomplish
goals; these resources are located in networks of individuals, groups, or organizations (Burt, 2000; Coleman, 1989; Inkpen & Tsang, 2005; Nahapiet & Ghoshal, 1998). Early work in social capital describes three forms: *structural capital* referring to the overall pattern of connections between members, *relational capital* about the qualities of relationship, for example respect and trust, and *cognitive capital* which, like shared repertoire, refers to resources providing shared representations, interpretations, and meaning (Nahapiet & Ghoshal, 1998). These three forms of social capital have been used to explore relationships to intellectual capital, “the knowledge and knowing capability of a social collectivity” (Nahapiet & Ghoshal, 1998, p. 245), and team innovations (Hu & Randel, 2014).

The concept of social capital can be aligned to CoPs to better understand them. Structural and relational capital can be related to Wenger’s (2002) concepts of community or mutual engagement, while cognitive capacity is more closely linked to Wenger’s concept of shared repertoire. The domain of the CoP promotes a cohesiveness between network members (Wenger et al., 2002), relating most directly to relational capital.

Above, the literature review describes how and why CoPs are used or cultivated, as well as some of their possible benefits and weaknesses. Although the potential for CoPs to promote learning, knowledge mobilization, and other benefits is recognized, limited research exists on evaluating the ways in which they might produce such benefits.

### 2.3 Evaluation

Program evaluation is “the systematic collection and analysis of information about program activities, characteristics, and outcomes to make judgments about the program, improve the program effectiveness and/or inform decisions about future programing” (Patton, 1997, p. 23). Guba and Lincoln (2001, p. 1) describe evaluation as “one of the three basic forms of disciplined inquiry, the others being research and policy analysis”. The field of evaluation was developed within the context of evaluating social programs. Early approaches were pragmatic with respect to feasibility and the focus was invariably on program delivery rather than answering research questions (Portela, Pronovost, Woodcock, Carter, & Dixon-Woods, 2015). The goal of evaluation has been suggested to be *use* (of evaluation) (Patton, 1997) and social betterment
(Henry, 2000). According to Schwandt (as cited in Bates, 2004, p. 341) the fundamental questions of evaluations are “Are we doing the right thing, and are we doing it well?”

Program evaluation can serve multiple purposes. It can be used to facilitate program improvement and development, generate knowledge, facilitate learning, promote accountability and render judgment. Traditionally, evaluation was viewed as the assessment of merit (intrinsic quality) and worth (extrinsic usefulness or applicability) (Patton, 1997, 2011). Demonstrating value is a common goal in evaluation, particularly when accountability is a concern. However, from a program improvement standpoint, evaluations can help programs or organizations to be more strategic and deliberate, help to make a case for continued funding and support, and help to build relationships with stakeholders (Guba & Lincoln, 2001; Stufflebeam, 2001). Often, evaluators endeavour to provide timely feedback designed to enhance a program’s operations (Carman, 2013). Evaluations are also a source of knowledge development, referring “to efforts to discover and test general theories and propositions about social processes and mechanisms as they occur in the context of social policies and projects” (Mark, Henry, & Julnes, 2000, p. 58). Recently, some evaluations have adopted the aim of building consensus through dialogue, rather than attempting to reach discoverable truth (Guba & Lincoln, 2001; Schwandt, 2001). This has led to promoting a learning culture with stakeholders (Dunkley & Franklin, 2017).

Research and evaluation are both forms of inquiry. Weiss (1993) describes evaluation research as “examine[ning] the effects of policies and programs on their targets—whether individuals, groups, institutions, or communities—in terms of the goals they are meant to achieve” (p. 93). Research on evaluation, on the other hand, is described as “any purposeful, systematic, empirical inquiry intended to test existing knowledge, contribute to existing knowledge, or generate new knowledge related to some aspect of evaluation processes or products, or evaluation theories, methods, or practices” (Coryn et al., 2016, p. 3). Research on evaluation generally, and the study of evaluation approaches in particular, is important not only for the scientific advancement of evaluation, but also for professionalizing program evaluation (Coryn et al., 2016). This dissertation engages in research to support evaluation and research on evaluation.
2.3.1 Approaches to evaluation

The field of evaluation is diverse, with many approaches and methods. Traditionally, evaluations are classified as either formative or summative (Smits & Champagne, 2008). Summative evaluations answer the question ‘Does the intervention work?’ and therefore require that the program be well defined. This evaluation is commonly done at the endpoint of the intervention with the intention of rendering a judgment of merit or worth. Formative evaluation is thought of as an evaluation that focuses on process and improving the program (therefore resulting in a higher degree of goal attainment) (Scriven, 1996). It is also seen as a step in preparing a program for summative evaluation. The implication is that a formative evaluation will lead to a “stable, fixed model that can be judged worthy or unworthy” (Patton, 2011, p. 37). The latter view of formative evaluation reflects earlier thinking (Patton, 2011) and this view may not reflect practice. While these two types of evaluation are the most prevalent, there are a number of other evaluation approaches.

Process or outcome evaluation is another common distinction in evaluations. Process evaluations focus on the implementation logic or the program logic, while outcome evaluations focus on the results of a program. In evaluation, a process is “a way of talking about common action that cuts across program activities, observed interactions, and program content” (Patton, 2011). Outcomes are “all results of the change process observable and measurable in the intervention context” (Fridrich, Jenny, & Bauer, 2015, p. 2). Additionally, outcomes can also refer to changes in attitudes, behaviours, knowledge, skills, status, or level of functioning expected to result from program activities (WK Kellogg Foundation, 2004). Relevant to this dissertation, outcomes can happen at different levels of impact: individual, group, institution, etc.

Evaluation approaches can also be understood with respect to whether they are top-down or bottom-up. Top-down evaluations, such as impact evaluation or some theory-driven evaluations, stem from an existing evidence base or model and they seek a generalizable model. Bottom-up approaches to evaluation such as participatory, empowerment and transformative evaluations can promote capacity building, relevance and use by engaging stakeholders and adapting to local context (Patton, 2002, p. 477).
Middle-range approaches, such as realist evaluation and developmental evaluation, incorporate elements of both bottom-up and top down. Realist evaluation places emphasis on the mechanisms and context and focuses on the questions ‘What works, for whom, under what conditions, and with what results?’ (Pawson & Tilley, 1997). Causal mechanisms are underlying the relationship between intervention and effects (Chen & Rossi, 1987). Chen (2005) describes mechanisms as mediating and moderating. A mediating causal mechanism “is a component of a program that intervenes in the relationship between two other components” (p. 240), while a moderating causal mechanism “represents a relationship between program components that is enabled, or conditioned, by a third factor” (p. 241). Developmental evaluation supports the development of a program, project, personnel and/or organization. The evaluator’s role in developmental evaluation is “to elucidate team discussions with evaluative data and logic, and to facilitate data-based decision-making in the developmental process” (Patton, 2011, p. 20) Developmental evaluation “adds a dynamic dimension in recognition that the very notion of what works is subject to change under conditions of complexity” (Patton, 1994, p. 317).

2.4 Summary

This research focuses on the evaluation of communities of practice. The literature review provides a comprehensive definition of communities of practice and outlines how communities of practice compare to other groups and networks. It describes CoPs used as interventions, and includes an overview of potential benefits and weaknesses. An overview of foundational concepts in understanding CoP theory, along with other intersecting concepts that inform the development of the evaluation framework and the analysis of the data, has been provided. This review also defines evaluation and presents an overview of the multiple approaches. Since the dominant view of evaluation is often the summative sense, it is important to understand there are multiple types and approaches used in the field of evaluation. Limited research has been done in the connection of the two major topics explored in this literature; that is, there is an absence of research examining how communities of practice are currently evaluated. Thus, the starting point for this research, is addressed in the following chapter.
Chapter 3
Evaluating communities of practice and knowledge networks: A systematic scoping review of evaluation frameworks

3 Paper 1

3.1 Abstract

Communities of Practice (CoPs) are increasingly considered a part of ecohealth and other sectors such as health care, education, and business. However, there is little agreement on approaches to evaluate the influence and effectiveness of CoPs. The purpose of this review was to understand what frameworks and methods have been proposed or used to evaluate CoPs and/or knowledge networks. The review searched electronic databases in interdisciplinary, health, education, and business fields, and further collected references and forward citations from relevant articles. Nineteen articles with 16 frameworks were included in the synthesis. The purposes of the evaluation frameworks varied; while some focused on assessing the performance of CoPs, several frameworks sought to learn about CoPs and their critical success factors. Nine of the frameworks had been applied or tested in some way, most frequently to guide a case study. With limited applications of the frameworks, strong claims about generalizability could not be made. The review results can inform the development of tailored frameworks. However, there is a need for more detailed and targeted CoP evaluation frameworks, as many imperative CoP evaluation needs would be unmet by the available frameworks.

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3.2 Introduction

Ecosystem approaches to health (ecohealth) is an emerging field producing ongoing debates about environmental and health issues, and about the development of the field itself (Charron, 2012a; Webb et al., 2010). In its early stages, the ecohealth field recognized the value of supporting communities of practice (CoPs) through networking and capacity building activities (e.g., meetings on specific issues such as malaria in urban areas of Africa or regional training workshops) (De Plaen & Kilelu, 2004). CoPs are groups of people who interact on an ongoing basis to share knowledge and expertise about common practices, problems, or topics (Wenger et al., 2002). A knowledge network (KN) refers to a set of connections among people who provide resources to solve problems, share knowledge, and make further connections (Wenger et al., 2011). CoPs and KNs may occur naturally, but they are increasingly being employed deliberately as knowledge management tools (Cox, 2005; Li et al., 2009a; Wenger, 2004). Foundational to ecohealth is that “health and well-being are the result of complex and dynamic interactions between determinants, and between people, social and economic conditions, and ecosystems” (Charron, 2012c). Structures that promote alliances among multiple disciplines and bring in new ideas can help people understand the interrelationships between health, ecology and society, and apply these understandings in practice.

The CoP model can provide opportunities to break down professional and organizational barriers (Ranmuthugala, Plumb, et al., 2011) and to support the learning of newcomers to the field (Lave & Wenger, 1991). It can offer a way to translate and share tacit knowledge or ‘know how,’ which can be a valuable resource for capacity building and the implementation of evidence-based practices (Barwick et al., 2009; Wenger, 1998b). CoPs offer new ways of structuring collaboration in response to the challenges of complex systems. With the current emphasis on partnership, collaboration, and networks, and with the momentum of the CoP model, new concepts, methodologies, and techniques to understand the mechanisms and the potential value of these networks are necessary. However, despite the growing interest in, and implementation of, CoPs, little agreement exists on approaches to evaluate their influence (Li et al., 2009b) and limited evaluation of CoPs and knowledge networks has occurred (Bertone et al., 2013; Li et al., 2009b). As a result, empirical evidence supporting the effectiveness of CoPs remains limited,
and even fewer analyses investigate the mechanisms that determine effectiveness (Li et al., 2009b).

Communities of practice in ecosystem approaches to health (CoPEHs) are an application of CoPs within the field of ecohealth. CoPEHs grew from a desire for researchers and practitioners to share knowledge and experience. They were developed with the central purposes of improving research on specific ecohealth themes and teaching others how to conduct ecohealth research (Parkes, Charron, & Sánchez, 2012). Five CoPEHs have emerged around the globe over the last decade in Latin America and the Caribbean (CoPEH-LAC), the Middle East and North Africa (CoPEH-MENA), West Africa (CoPEH-AOC), South and South East Asia (CoPEH-SSEA), and Canada (CoPEH-Canada) (see listing and additional information on CoPEHs in Appendix A). Other partnerships are also emerging around ecohealth and One Health. Recent additions of regionalized ecohealth efforts include initiatives in Africa and Oceania focused on regional conferences with potential to catalyze ‘regional chapters’ of the International Association for Ecology & Health. CoPs and other forms of collaborative networks are gaining momentum in the ecohealth field (Parkes et al., 2012) as they provide opportunities to define and advance the field of ecohealth through knowledge creation, enhanced learning, identity building, and professional development. Although there is potential for CoP and knowledge network structures to promote learning and knowledge mobilization, limited research exists to understand and evaluate how they work.

This review drew from Wenger and colleagues (Wenger et al., 2002; 2011) in defining CoPs and KNs; however, CoP and KN terminology is applied differently throughout the literature. Some authors suggest that the difference between networks and CoPs is merely a matter of terminology (Creech et al., 2012), and definitions of KNs often align closely to those of CoPs (Serrat, 2010; Stein, Stren, Fitzgibbon, & MacLean, 2001). However, despite performing many of the same functions, other authors distinguish basic differences, such as identity (McDermott, 1999; Verburg & Andriessen, 2006), or visibility (Botkin, 1999). The definitions of CoP and KN used in this review align with CoPEHs’ focus on capacity building and learning. Wenger et al.’s (2011) definition of knowledge networks highlights linkages that allow information flow, knowledge creation, and learning leveraged by an individual. The original goals of CoPEHs, “to foster decentralized communication mechanism to delivery key services to its membership”
(Flynn-Dapaah, 2003, p. 5), align with the concept of knowledge networks. Hence, this review included both concepts/terms, thus avoiding exclusion or relevant evaluation frameworks and capturing an appropriate breadth of evaluation frameworks that would be applicable to a variety of collaborative structures in different fields, including ecohealth CoPs and networks.

Several ecohealth CoPs and networks are currently engaged in evaluation; CoPEH-LAC and CoPEH-Can are involved in self-evaluation of their networks, informed by social network analysis (SNA) and longitudinal qualitative analysis (Parkes et al., 2012); and Spiegel and colleagues (2011) developed a framework to guide CoP activities and assess their outcomes and impacts. Despite efforts to evaluate and understand CoPs in Ecohealth, many questions remain, particularly around health and social outcomes of CoPs (Spiegel et al., 2011). Parkes et al. (2012, p. 248) highlight evaluation summative questions, such as, “Would we do differently or not as well in the absence of collaboration?” Additionally, addressing developmental questions, such as ‘What factors contribute to successful knowledge exchange?’ would promote more effective communities and networks. These questions can be challenging to answer as CoPEHs exhibit elements of complex interventions, and have been described as dynamic and complex learning systems (Barragán-Ocaña, Quijano-Solís, Vega-Díaz, & Sánchez-Lara, 2012). Evaluation frameworks can help in answering these, and other, evaluation questions. They can guide evaluations by outlining the approach or design to be applied, and by providing the scheme or analytical tool for the process of assessment. Ecohealth community members are calling for more systematic monitoring of ecohealth research and evaluation of collaborative structures (Charron, 2012c; Parkes et al., 2012).

Hence, the purpose of this systematic scoping review was to understand what frameworks and methods have been proposed or used to evaluate CoPs and/or knowledge networks. A scoping review approach (Arksey & O'Malley, 2005; Davis, Drey, & Gould, 2009; Levac, Colquhoun, & O’Brien, 2010) was determined to be appropriate for this review because it allowed for a summary of the breadth and depth of the evaluation of CoP and KNs. This review aims to provide practical information for evaluators and network practitioners regarding the current state of literature and to increase their awareness of the frameworks available for adaptation to their own ecohealth CoP and network evaluations.
3.3 Methods

3.3.1 Overall Approach

As the underlying concept of CoPs and/or knowledge networks is not well operationalized, the search terms and databases were chosen to be inclusive of CoPs in multiple fields and reflective of ecohealth CoPs and networks. Although overlap with other types of networks, such as epistemic communities (Haas, 1992), practice-based networks, and service delivery networks may occur, this review does not include these other types because they do not fit with the capacity building nature of CoPs nor the nature and membership of CoPEHs and ecohealth networks. This review sought to find frameworks from multiple disciplines to facilitate learning across disciplines. For example, frameworks for CoPs and/or knowledge networks from fields outside of ecohealth remain relevant to ecohealth. Hence, this review included both networks that occur within the bounds of an organization and those that link individuals across organizations.

3.3.2 Search Strategy

To identify existing evaluation frameworks for CoPs and KNs, the review used two strategies to find studies and reports: 1) searching eight electronic databases from multiple disciplines, and 2) snowball sampling of references to, and citations of, relevant articles. The database search took place in January 2013 and the eight databases - Scopus, Web of Science, Medline, EMBASE, CINAHL, ERIC, EconLit, and Business Review - captured frameworks from a variety of disciplines. The search terms were based on a preliminary scoping review and on other CoP-related systematic reviews (Li et al., 2009b; Ranmuthugala, Plumb, et al., 2011). The terms included ‘communit* of practice’, ‘knowledge network*’, ‘network* of practice’, ‘situated learning’, and ‘communit* of interest,’ as well as ‘evaluation framework’, ‘program evaluation’, ‘evaluation methods’, and ‘logic model’. To capture the complex intervention nature of CoPs, the review included "theor* of change" and ‘realist* evaluation*’. In addition to searching popular databases, the review examined the references and forward citations of relevant articles. Citing articles were found using Google Scholar and Scopus, or Web of Science, if not found in Scopus. The ‘snowball sampling’ occurred in October 2013.

Two reviewers (KM, KP) independently screened a sample (4%) of article titles to pilot the screening criteria; then one reviewer applied the criteria to the entire set (KM). The title
screening stage excluded articles with clearly unrelated topics (e.g., artificial intelligence, clinical trials), captured initially due to the broad nature of the search terms. Two reviewers (KM, KP) then screened three random samples of 100 articles (totaling 8%) to ensure the screening criteria were clear and that they were consistently applied (full inclusion and exclusion criteria are set out in Appendix B). One reviewer (KM) then reviewed the remaining titles and abstracts. When it was not possible to exclude based on title and abstract, two of three reviewers (KM, KP, JY) assessed each full text independently. Discrepancies were discussed through to agreement; if agreement was not achieved during initial discussion, a third reviewer joined the process. Once the reviewers had established relevant articles from the database search, one reviewer (KM) screened titles and abstracts from their references and citations, to find additional frameworks that met the inclusion criteria. Each of the selected articles was full-text screened by two reviewers (KM, KP, JY) for relevance.

English language peer-reviewed articles, conference proceedings, and reports published after 1991\(^3\) were included. Existing reviews related to communities of practice (Li et al., 2009b; Ranmuthugala, Plumb, et al., 2011) or evaluation frameworks (Van Eerd et al., 2011) informed the inclusion and exclusion criteria. Articles were included based on relevance - whether the article presented a framework designed to evaluate a CoP or knowledge network. Articles did not need to use the terms ‘CoP’, or ‘knowledge network’ or ‘evaluation framework’ to describe the model and/or methods that they presented. The screening process did not exclude frameworks based on study quality, as the goal was not to assess quality, but to describe frameworks that have been proposed.

3.3.3 Data extraction

Three reviewers (KM, KP, JY) iteratively tested data extraction templates with three articles. Based on the consistency of the results and discussions by the reviewers, modifications for clarity were made and additional fields were added after each of the first two articles. One reviewer then applied the template to the remaining articles, and two reviewers checked 25% of

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\(^3\) The year of publication of Lave and Wenger’s (1991) book *Situated learning: Legitimate peripheral participation* in which the term “community of practice” was first used.
the completed extractions for accuracy and consistency. The extraction template included multiple spreadsheets recording data about the articles, the types of networks, specific network information (if applicable), the evaluation frameworks, and the application or testing of the frameworks (if applicable).

3.4 Results

The database search yielded 5348 original articles (Figure 3.1). After the screening process, nine articles were selected from this set. A further ten articles were located through references and snowball searching. The 19 articles included in the review had 16 unique frameworks that were variously described as, for example, ‘systematic framework for analyzing…’, ‘guidelines for assessment’, ‘diagnosis framework’, or ‘conceptual framework’.

Figure 3.1 Literature search strategy: article identification and screening for relevance
The frameworks’ publication dates ranged from 2002 to 2013, and the publications originated from a variety of countries, including Australia, Canada, Italy, Korea, and the Netherlands. The majority of frameworks (13 out of 16) used CoP terminology to describe their units of analysis, while others used the terms “knowledge network,” “working group,” or a combination of these terms. In those that focused on CoPs, the work of Wenger and colleagues (2002) was commonly used or referenced to define CoPs. Most frameworks (11 out of 16) focused on evaluating CoPs that were set within organizations; these frameworks came from management literature, but were not limited to a specific sub-sector (e.g., manufacturing technology). Other frameworks came from the fields of health (n=3), education (n=1), international development (n=1), and interdisciplinary research (n=1). The majority of the articles provided limited descriptions of the member populations. The review assumed that CoPs/KNs members within an organization were employees; their disciplinary backgrounds included finance, software development, and engineering. Researchers, health care practitioners and transnational actors in health policy were included as members of CoPs/KNs that crossed organizational boundaries.

3.4.1 Purpose and main components of the frameworks

Table 3.1 outlines the multiple aims and approaches among the frameworks. Generally, the frameworks serve one or several of the following purposes: to assess CoPs/KNs, to understand CoPs/KNs, and/or to promote the value of CoPs/KNs. The majority of the frameworks focused on understanding CoPs/KNs rather than on assessing them against benchmarks or specific goals. Some frameworks addressed multiple aims; for example to understand the goals, strategies, or mechanism of CoPs and to measure performance. The structures and dimensions of the frameworks also varied. The majority used categories of measures as bases for their models, although two studies also included a framework that outlined the evaluation process (Ranmuthugala, Cunningham, et al., 2011). The right column of Table 3.1 outlines the main components present in each framework.

The frameworks varied in extensiveness. Some were quite limited in their scope while others attempt to trace pathways between the dimensions that lead to CoP success, and to provide a series of indicators and suggestions for data collection and analysis (Meessen & Bertone, 2012). In some cases, authors provided limited methodological information, making it unclear how one might operationalize the framework (Loyarte & Rivera, 2007). Other frameworks were quite
specific and offered tools that could be applied in the study of CoPs and/or knowledge networks (Verburg & Andriessen, 2006; Wenger et al., 2011). Several of the articles were analysis-oriented and provided detailed information about analysis methods and associated formulae (Chu & Khosla, 2009; Chu, Khosla, & Nishida, 2012; J. Lee, Suh, & Hong, 2010).
<table>
<thead>
<tr>
<th>Authors (Year)</th>
<th>Network type</th>
<th>Sector/Setting</th>
<th>Aim of framework</th>
<th>Description/Main components</th>
</tr>
</thead>
<tbody>
<tr>
<td>McDermott (2002)</td>
<td>CoP</td>
<td>Management/within organizations</td>
<td>To make connections between activities and results in a rigorous, useful, and convincing way.</td>
<td>Framework includes 1) activities; 2) outputs (personal knowledge, strength of relationship, and access to information); 3) value (individual, team/project, organizational); 4) business results</td>
</tr>
<tr>
<td>Verburg and Andriessen (2006)</td>
<td>CoP</td>
<td>Management/within organizations</td>
<td>To get systematic insights into the characteristics and performances of CoPs and of the opinions of CoP-members, and to provide feedback on the performance of CoPs at the individual, group, and organizational level.</td>
<td>Framework structures items into 1) characteristics (forms, goals, roles), 2) processes (activities, communications, coordination and ICT use), and 3) outcomes (individual rewards, group vitality and organizational products).</td>
</tr>
<tr>
<td>Loyarte and Rivera (2007)</td>
<td>CoP</td>
<td>Management/within organizations</td>
<td>To analyze the coherence between organizational objectives and the cultivating process of CoPs (McDermott’s (1999) three dimensions) and to analyze the coherence between the integration of CoPs in organizations and their results (Wenger’s (1998) basic components of CoPs).</td>
<td>Framework includes: 1) objectives (organizational, individual), 2) process of cultivation (incl. the kind of knowledge the community shares); the degree of connection and identity among members, and how closely integrated sharing knowledge is with people’s everyday work; 3) integration characteristics; and 4) results (positive, negative)</td>
</tr>
<tr>
<td>Scarso and Bolisani (2008); Scarso et al. (2009)</td>
<td>CoP</td>
<td>Management/within organizations</td>
<td>To identify and integrate the main dimensions shaping the creation and management of CoPs.</td>
<td>Framework includes four internal pillars/main dimensions that ground a CoP: 1) organizational, 2) cognitive, 3) economic, 4) technological. It includes two external environmental elements: business context and knowledge strategy</td>
</tr>
<tr>
<td>Conklin and Stolee (2008); Stolee and Conklin (n.d.)</td>
<td>Knowledge network</td>
<td>Healthcare/multiple organizations</td>
<td>To assess knowledge exchange activity in relation to the dimensions of evidence, context, facilitation, and results, on multiple scales of network functioning.</td>
<td>Framework is represented by a two-dimensional rubric with network levels (network wide, network component, implementation site) and knowledge exchange (evidence, context, facilitation, results).</td>
</tr>
<tr>
<td>Grootveld and Helms (2008)</td>
<td>CoP</td>
<td>Industry/within organizations</td>
<td>To identify context factors that influence CoP success, and to propose a preliminary assessment tool to diagnose CoP context factors within an organization.</td>
<td>Framework identifies 11 contextual factors within three groups: 1) people (member value, leader, trust, identity) 2) organization (management support, launch strategy, KM strategy, reward system), and 3) system through which knowledge sharing occurs (media choice, usability). Finally, these occur within the organization’s culture, presented as an additional factor.</td>
</tr>
<tr>
<td>Author(s) and Year</td>
<td>Type of Knowledge Community</td>
<td>Purpose</td>
<td>Framework/Methodology</td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
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<td></td>
</tr>
<tr>
<td>Chu and Khosla, (2009); Chu et al. (2012)</td>
<td>CoP Industry/ within organizations</td>
<td>To analyze various index priorities and strategy preferences of CoPs to understand their KM culture, allocate resources towards the chosen business strategy and measure KM performance in the context of the chosen business strategy.</td>
<td>Framework includes four dimensions: 1) locus of leadership, 2) incentive mechanism, 3) member interaction, 4) complementary asset. Each has four criteria (e.g., homogeneity of members) with four associated business strategies.</td>
<td></td>
</tr>
<tr>
<td>Lee et al. (2010)</td>
<td>CoP Management/ within organizations</td>
<td>To assess the condition of the CoP indirectly and to establish stage of maturity and a road map for moving between stages.</td>
<td>Framework identifies a six-step process that identifies the stage at which the CoP is and the associated critical success factors. Includes four maturity levels (building, growth, adaptive, and close), 11 critical success factors, and 28 corresponding CoP activities.</td>
<td></td>
</tr>
<tr>
<td>Ranmuthugala, Cunningham, et al. (2011)</td>
<td>CoP Healthcare/ multiple settings</td>
<td>To identify context-mechanism-outcome configurations that will explain the role of CoPs in improving healthcare practice.</td>
<td>Study protocol for a realist evaluation outline in four stages 1) theory - CMO configurations generation, 2) hypotheses generation/reframing, 3) observation- hypotheses testing, w/survey, 4) program specification- review theories in light of findings.</td>
<td></td>
</tr>
<tr>
<td>Wenger et al. (2011)</td>
<td>CoP Education/ within organizations</td>
<td>To provide the foundation for an evaluation process that can integrate heterogeneous sources and types of data to create a compelling picture of how CoPs and networks create value for their members, for hosting organizations, and for sponsors.</td>
<td>Framework includes both a set of relevant indicators for data collection and a process for integrating these indicators into a meaningful account of value creation. It includes 5 cycles: 1) immediate value - activities and interactions, 2) potential value - knowledge capital, 3) applied value - changes in practice, 4) realized value - performance improvement, and 5) reframing value - redefining success.</td>
<td></td>
</tr>
<tr>
<td>Zhang et al. (2011)</td>
<td>Working group Inter-disciplinary research/multi-national</td>
<td>To demonstrate progress of networks and examine challenges and mechanisms to address challenges.</td>
<td>Framework includes structure (network size, density, centralization) and process description based on stages of development (initiating, formulation agreement, advancing research, sustaining research group).</td>
<td></td>
</tr>
<tr>
<td>Barragán-Ocaña et al. (2012)</td>
<td>CoP Industry /within organizations</td>
<td>To explore structural mechanisms in use with the CoPs, particularly those that guarantee organizational viability through the functions they carry out.</td>
<td>Uses a viable system model focused on organizations interacting with their environment. Interactions include an operative element, which carries out the organization’s fundamental operations, and a meta-system, which guarantees the organization’s functions as a ‘whole’.</td>
<td></td>
</tr>
<tr>
<td>Creech et al. (2012)</td>
<td>Networks and/or CoPs International development</td>
<td>To strengthen performance assessment and improvement of networks, and to identify starting points in laying out a more detailed research agenda for future work.</td>
<td>Framework includes four points 1) focus and extensiveness of the network, 2) evolution of the structure of the network over time 3) social capital within the network, and 4) activities and outcomes of the network, and the shared value created by the network.</td>
<td></td>
</tr>
<tr>
<td>Authors</td>
<td>CoP Field</td>
<td>Purpose</td>
<td>Framework/Methodology</td>
<td></td>
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<tr>
<td>-------------------------</td>
<td>----------------------------</td>
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<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Kim et al. (2012)</td>
<td>CoP Management with in organizations</td>
<td>To identify current knowledge-sharing activity status in a CoP.</td>
<td>Framework outlines several consecutive stages of 1) learning about the network (SNA); classifying members (balanced player, egoistic propagator, egoistic receiver and knowledge isolator), 2) classifying the network (active community, spreading community, learning community, inactive community), and then 3) aligning it with a set of CoP strategies (e.g., increase awareness of members’ knowledge).</td>
<td></td>
</tr>
<tr>
<td>Meessen and Bertone (2012)</td>
<td>CoP Health policy / transnational</td>
<td>To analyze the role that knowledge (which is produced, created and managed through the CoPs) plays in the process of selecting and implementing health policies, which in turn, may have impacts on health outcomes valued by citizens.</td>
<td>Framework retraces the causality path between a series of dimensions that members activate to ensure the CoP functions well. The six dimensions (available resources, strategies to mobilize resources, knowledge management processes, expansion of knowledge, knowledge-based policies and practices, better health and welfare outcomes) contains elements and/or sub-elements and an associated set of indicators.</td>
<td></td>
</tr>
<tr>
<td>Yap and Robben (2013)</td>
<td>CoP Industry / within organizations</td>
<td>To assess the added value of networked learning through online communities and networks for businesses.</td>
<td>The model links return-on-investment for networks of practice technology to the return-on-investment for the resources and time. Specific components are online dialogue (social-capital, learning); narrative cycles of measurement (immediate, potential, applied, realized, and reframing); and measures of learning (shareholder value, customer engagement, and employee experience).</td>
<td></td>
</tr>
</tbody>
</table>
### 3.4.2 Dimensions included in the frameworks

Table 3.2 outlines common measurements or considerations that are part of the frameworks. This overview provides a sense of the types of evaluation the frameworks propose (e.g., process or summative). This analysis explored whether the frameworks take into consideration the internal characteristics, the external context, and the process and outcomes of the group.

This analysis examined whether each framework considers the network’s stage of development (e.g., coalescing, stewardship), or changes over time and whether each framework considers the specific goals or scope of the network or whether incorporates measures of structure. Three frameworks considered the stage of the CoP, each with a different approach. The framework developed by J. Lee et al. (2010) provides a method for determining the stage of a CoP (i.e., building, growth, adaptive, close), while J. Zhang et al. (2011) reported on one network’s progress through various stages. Finally, Creech et al. (2012) drew attention to the life cycle of the network and the importance of measuring change over time. Only four of the frameworks incorporated the goals or scope of the CoP/KN by including a network-level exploration of goals/scope (Creech et al., 2012; Loyarte & Rivera, 2007) or measuring progress against network goals (Kim, Hong, & Suh, 2012; J. Lee et al., 2010). Approximately half of the frameworks included some measure of the network structure. Earlier frameworks used descriptive measures of structure, while frameworks that are more recent suggested incorporating social network analysis into the evaluation.

Frameworks were considered to have met this criterion if they incorporated context, as it was defined by the frameworks’ authors. Interpretations of context varied; for example, the Verburg and Andriessen (2006) model includes measures of the basic structural elements of the network (e.g., size of network, existence of subgroups) as well as organizational support, while Scarso and colleagues (2008; 2009) considered context as the host organization’s knowledge strategy and business environment. Context was most commonly considered the external environment of the CoP/KN, although several articles noted that the community itself is an important context when considering the identity of members (Loyarte & Rivera, 2007; Verburg & Andriessen, 2006).
The way in which context was factored into the framework also varied. The most comprehensive inclusion of context comes from Grootveld and Helms (2008), who presented three categories of contextual factors (people, organization, and system), and their fit in the organizational culture. In Conklin and Stolee’s (2008; n.d.) framework, context is a knowledge exchange dimension, and they suggested context should be measured at each network dimension (i.e., for the network, network-component, and implementation site). In the frameworks proposed by Verburg and Andriessen (2006), Scarso and colleagues (2008; 2009), and Barragán-Ocaña et al. (2012) context/environment is one of three of four major components of their model. Loyarte and Rivera (2007), Chu and colleagues (2009; 2012), and Wenger et al. (2011) gave mention to the importance of context, but do not state specific measures.

Understanding the processes and activities of a network is a key step in understanding the factors that make it effective and the ways through which it achieves outcomes. Frameworks that propose documentation of a CoP/KNs activities or their process of development were included. Most frameworks measured some dimension of network activity. Several of these frameworks (Meessen & Bertone, 2012; Ranmuthugala, Cunningham, et al., 2011; Scarso & Bolisani, 2008) focused on the mechanisms that create effective networks. Eight of the frameworks included measures of CoP/KN outcomes. Of the frameworks that included outcomes, most focused only on the positive effects of networks; two frameworks (Loyarte & Rivera, 2007; Scarso & Bolisani, 2008) included both positive outcomes and negative outcomes or costs of the networks. The level of impact refers to whether outcomes are measured by multiple scales; seven of the frameworks do. Four focused on individual levels, and group and/or organizational levels. Set in the healthcare environment, Conklin and Stolee (2008; n.d.) included outcomes at the implementation site, at the network-component (CoP) level and at the wider network-level. Wenger et al. (2011) had a different interpretation of level of outcome; they include levels of immediate value, potential value, applied value, and realized value. Creech et al. (2012) suggested that assessment take into consideration the level of value creation outlined by Wenger et al. (2011).
Table 3.2 Overview of CoP evaluation framework components

<table>
<thead>
<tr>
<th>Authors (Year)</th>
<th>Goals/Scope</th>
<th>Stage/Time</th>
<th>Context</th>
<th>Structure</th>
<th>Process/Activities</th>
<th>Outcomes</th>
<th>Level of impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>(McDermott, 2002)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verburg and Andriessen (2006)</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loyarte and Rivera (2007)</td>
<td>✔</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td>(+/-)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scarso and Bolisani (2008); Scarso et al. (2009)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>(+/-)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conklin and Stolee (2008); Stolee and Conklin (n.d.)</td>
<td></td>
<td></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grootveld and Helms (2008)</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chu and Khosla (2009); Chu et al. (2012)</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>J. Lee et al. (2010)</td>
<td>✔</td>
<td>✔</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Ranmuthugala, Cunningham, et al. (2011)</td>
<td></td>
<td>✔</td>
<td>✔(SNA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wenger et al. (2011)</td>
<td>✔</td>
<td>✔(SNA)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J. Zhang et al. (2011)</td>
<td></td>
<td>✔</td>
<td>✔(SNA)</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barragán-Ocaña et al. (2012)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creech et al. (2012)</td>
<td>✔</td>
<td>✔</td>
<td>✔(SNA)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Kim et al. (2012)</td>
<td></td>
<td>✔</td>
<td>✔(SNA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Meessen and Bertone (2012)</td>
<td></td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Yap &amp; Robben, 2012)</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stage/Time: Considered the stage of development of the network (e.g., coalescing, stewardship), or changes in the network over time.
Goals/Scope: Considered the specific goals or scope of the network
Context: Incorporated context in the framework (context as defined by authors)
Structure: Incorporated measures of structure in the framework (e.g., size of network)
SNA: Used social network analysis (SNA) to measure the structural dimension of the network
Process/Activities: Included measures of network activities or the processes of development
Outcomes: Incorporated measures of outcomes in the framework
+/−: Considered both positive and negative outcomes and/or costs of the network
Level of impact: Incorporated outcome measures and different scales (e.g., individual, network, organization)
3.4.3 Application/testing of evaluation frameworks

Nine of the studies applied or tested their frameworks in some form (Table 3.3). Seven of these frameworks were focused on CoPs within organizations; two were focused on groups that crossed organisational boundaries. The level of reporting with respect to the application or testing process varied. What was learned about CoPs/KNs was more commonly reported than what was learned about the framework or the evaluation process. Only two of the articles reported any modifications to the frameworks after they were piloted (Grootveld & Helms, 2008; Verburg & Andriessen, 2006). The majority of the articles framed the testing or application as a case study. Three of the studies tested or pilot tested their frameworks; this was possible because each framework was, or incorporated, an analytical tool. Two of the case study articles provided limited information about how the framework was applied, making it difficult to understand how the framework and evaluation process could be applied or transferred to another setting (Loyarte & Rivera, 2007; Scarso et al., 2009).

Many of the frameworks provided general guides and approaches to evaluating CoPs/KNs; therefore, determining their test validities was not relevant. Four of the frameworks provided quantitative analytical tools; only Verburg and Andriessen (2006) reported on the process (i.e., performing scale analysis and reliability checks) and the results of determining the tools’ validity. One study made claims about the reliability of the framework without demonstrating how this was determined (Chu et al., 2012). The majority of studies suggested that their frameworks would benefit from additional empirical investigation to validate and refine them.

Articles also discussed the generalizability of the frameworks, making suggestions about where else and how the framework could be used; however, due to lack of testing, there was limited evidence of their applicability. Four articles suggested that the frameworks were applicable outside of the contexts in which they were tested. For example, Kim et al. (2012) suggested that, although their framework focused on CoP activities, the lessons learned would be applicable to any knowledge sharing activities within an organization. Five of the articles concluded that further application of the frameworks would be needed to understand their applicability to other settings. Some of the frameworks’ authors highlighted the need to test within different types of communities or settings.
All articles concluded that the frameworks were useful in assessing or understanding dimensions of CoP/KNs. While many authors acknowledged the limitations of their studies in demonstrating validity, several studies highlighted the utility of the frameworks when drawing conclusions about their value. Authors provided examples of how their case studies were able to inform strategic action in the CoPs (Grootveld & Helms, 2008) or shared the results that came from using their frameworks; for example, after implementing framework-based recommendations CoPs became more productive in their contributions to online forums (Kim et al., 2012).

Table 3.3 Evaluation framework application/testing approaches

<table>
<thead>
<tr>
<th>Authors (year)</th>
<th>How framework was applied/tested</th>
<th>Methods</th>
<th>The frameworks’ authors’ conclusion from application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verburg and Andriessen (2006)</td>
<td>Pilot tested tool on 7 CoPs within a large organization. Software development</td>
<td>Data collection consisted of three parts: 1) members- online questionnaire of members); 2) coordinator- interview with CoP coordinator; 3) context-checklist for high level key informants from organization</td>
<td>Refinements made to items in the tool. The assessment tool provided a useful method for quantitatively analyzing CoP effectiveness.</td>
</tr>
<tr>
<td>Loyarte and Rivera (2007)</td>
<td>Used framework to study the experiences of 15 organizations cultivating CoPs Multiple disciplines (e.g., bioscience, education, finance)</td>
<td>Document review and observation were used to collect information. Authors contrasted theory of CoPs with experiences, and analyzed challenges in building CoPs</td>
<td>The authors drew no conclusions about the framework itself. Based on the results of the study, they created a cultivation model to guide thinking within organizations.</td>
</tr>
<tr>
<td>Scarso et al. (2009)</td>
<td>Case study of CoPs within a large multinational organization Exploration and production in oil company</td>
<td>Qualitative and exploratory case study with direct involvement of staff</td>
<td>The results were encouraging for the framework’s usefulness for a sound and systematic investigation of the functioning and critical success factors of existing CoPs. However, further investigation is needed to refine and validate the framework.</td>
</tr>
<tr>
<td>Conklin and Stolee (2008)</td>
<td>Case study of a knowledge exchange activity that included a CoP Healthcare (seniors’ health)</td>
<td>Collection methods include document review, telephone interview with knowledge broker, and email survey of activity participants</td>
<td>The authors concluded using elements of the PARiHS framework (Kitson et al. 1998) and considered process and impacts in terms of level of operation to be valuable. Additional testing and review would benefit the evaluation model.</td>
</tr>
<tr>
<td>Authors</td>
<td>Methodology</td>
<td>Questionnaire/Interview Methodology</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>-------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Grootveld and Helms</td>
<td>Case study of CoPs within a large multinational organization</td>
<td>Semi-structured interview with CoP members, each factor from framework informed an interview question</td>
<td></td>
</tr>
<tr>
<td>(2008)</td>
<td>Engineering</td>
<td>The framework could be used to assess the contextual factors that contribute to CoP success within an organization. Framework was useful in practice, but a single case was not sufficient to validate.</td>
<td></td>
</tr>
<tr>
<td>Chu and Kholsa</td>
<td>Single (2009) and comparative (2012) case study of CoPs within large organizations</td>
<td>Questionnaire distributed to specific units within two organizations</td>
<td></td>
</tr>
<tr>
<td>(2009); Chu et al.</td>
<td>Technology research</td>
<td>The results generated were consistent with goals and strategies of both the surveyed organizations. This model was therefore “reliable, practical, and suitable for adoption by multinational knowledge based organizations in general.”</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lee et al.</td>
<td>Piloted model with three CoPs within one company</td>
<td>CoP member survey to identify current status among pre-defined maturity stages and an analytical hierarchy process to determine relative importance of critical success factors</td>
<td></td>
</tr>
<tr>
<td>(2010)</td>
<td>Finance</td>
<td>Framework is “holistic, systematic, comprehensive with maturity stages for navigating CoPs” however verification through additional application is needed.</td>
<td></td>
</tr>
<tr>
<td>Zhang et al.</td>
<td>Single case study with SNA (evaluation built around specific needs of network)</td>
<td>Self-administered social matrix questionnaire, and systematic observations and reflections of the experience made by the team members</td>
<td></td>
</tr>
<tr>
<td>(2011)</td>
<td>Multiple disciplines related to digital government research</td>
<td>The study was able to identify challenges and key enabling factors of the evaluated group; however, the generalizability will require additional case studies from various settings.</td>
<td></td>
</tr>
<tr>
<td>Kim et al.</td>
<td>Applied methodology to 59 CoPs in a company well known for knowledge management</td>
<td>Tracked online log of CoP activity (posts to website), used SNA</td>
<td></td>
</tr>
<tr>
<td>92012</td>
<td>Manufacturing</td>
<td>The framework could be applied in other organizations and the lessons learned from results could be useful to analyze knowledge sharing or knowledge transfer activities in any area of an organization.</td>
<td></td>
</tr>
</tbody>
</table>

3.5 Discussion

The body of literature pertaining to CoPs is growing; however, relatively few studies examine the evaluation of these structures. This study demonstrates the variety of purposes, scope and methodological approaches taken in evaluating CoPs and/or KNs. A key observation is that, despite finding approximately half of the frameworks through references and citations there have been limited adaptations and adoptions from previous studies. Furthermore, reports on applications of the frameworks have been restricted to the framework developers.

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4 Of the articles found through the electronic database search
3.5.1 Addressing Common Challenges in Evaluation

CoPs can, and CoPEHs do, exhibit elements of a complex intervention, bringing about certain evaluation challenges. A complex intervention has characteristics of nonlinearity, emergence, adaptation, uncertainty, dynamic interactions, and co-evolution (Patton, 2011). Evaluators often categorize interventions as simple, complicated, complex, or chaotic (Patton, 2011; Rogers, 2008). There are common challenges in evaluating CoPEHs and other complex interventions: the emergent nature of activities and outcomes, multiple scales of impact, long timelines of impact, hard-to-measure/intangible outcomes, and challenges of attribution/contribution. The evaluation frameworks reviewed here dealt with the challenges in different ways, with some authors incorporating flexibility and suggesting exploratory approaches.

CoPs are dynamic structures, which pose challenges for evaluation. Networks change, and with new members taking part, the foci of the CoPs can shift, not only in terms of the practices, but also in terms of forms of engagement and the structures of the networks themselves. Similarly, CoPEHs have changing membership and shifting priorities. Some of the frameworks reviewed are likely too rigid to fit the dynamic nature of the CoPEHs. More adaptable frameworks could support evaluations of emergent networks (Conklin & Stolee, 2008; Creech et al., 2012; Meessen & Bertone, 2012; Scarso & Bolisani, 2008). Theory-based approaches and realist evaluations (Ranmuthugala, Cunningham, et al., 2011) would also be appropriate. It is nearly impossible to isolate the effects of a CoP, and to determine causality for a specific program. Designs solely focused on attribution of CoP effects or employing counterfactuals are not suitable for evaluating CoPs. More plausible are pre-post designs, such as that suggested by (McDermott, 2002), to understand the value of CoPs within organizations.

CoPs can foster conditions for innovation (Chu & Khosla, 2009; Lesser & Storck, 2001; Verburg & Andriessen, 2006). Innovation, however, is difficult to measure given its tendency to occur in quantum leaps (Perrin, 2002). Trust, social capital, communication of tacit knowledge, and learning are other examples of important CoP outcomes that are challenging to measure. While some frameworks do not address the intangible or hard-to-measure aspects of CoPs, Wenger et al. (2011) suggested using member narratives. Another challenge for evaluation is the multiple scales on which CoPs operate and can expect to see outcomes. Several of the frameworks did incorporate measures at multiple levels of impact, for example, exploring value at the individual member level, the network level, and the organizational level. Nevertheless, the CoPEHs work at
additional scales and multiple timelines of impact. Some outcomes will occur in the short-term, such as connections developed among researchers, whereas ecological, health, and/or social impacts are likely to happen in the longer term.

### 3.5.2 Application to Ecohealth CoPs and Networks

Multiple forms of information from the frameworks can provide guidance for the evaluation of Ecohealth CoPs and Networks. Several frameworks proposed detailed sets of indicators (Meessen & Bertone, 2012; Wenger et al., 2011), which might be helpful for ecohealth researchers and practitioners evaluating their CoPs, particularly for understanding value creation and influence on policy and practice. Verburg and Andriessen (2006) and Wenger et al. (2011) provide tools that with some adaptation could guide data collection. Other frameworks are less detailed, but highlight key considerations that would be useful in evaluating CoPs; for example, Creech suggests the importance of CoP goals and stage of development. In addition to the guidance for CoP and KN assessments provided by the frameworks, evaluators can learn from the results of the evaluations. Several of the articles and reports included potential mechanisms of how CoPs and/or KNs work and some suggested critical success factors that could inform the development of a CoP. The level of evidence supporting the mechanisms and success factors varies, in some cases information was based on case studies, in others a list was generated from literature review. One article did not specify the source or methods used in determining success factors. Examples of success factors include financial resource, developing trust, opportunities for face-to-face meeting, and self-selected membership (Ranmuthugala, Cunningham, et al., 2011; J. Zhang et al., 2011). Keeping in mind that mechanisms can produce different results depending on the context, a realist informed review would be useful in understanding which are applicable to CoPs and networks working within the field of ecohealth.

It is worth highlighting several frameworks that would be most relevant to Ecohealth CoPs and networks. As mentioned previously, Verburg and Andriessen (2006) provide a tool and member questionnaire that could be useful in collecting relevant information with respect to CoP activities and value. Given that knowledge-to-action is one of the principles of Ecohealth, the Conklin and Stolee (2008) framework includes relevant structure for evaluation questions. Furthermore, the multiple levels of analysis could accommodate the nodal structure and heterogeneous membership of the CoPEHs. Exploring impacts at the implementation site acknowledges that knowledge flow within a network can have impacts beyond the members or
their organization. Attention to context is stressed by the Grootveld and Helms (2008) framework, though not all contextual factors would be relevant to CoPs and KNs working within the field of ecohealth due to the within organization context. While the framework by Chu and colleagues (2009; 2012) is situated in a business context, the focus on strategies for CoP improvement could inform an approach to evaluating Ecohealth CoPs and networks. The Wenger et al. (2011) framework would be particularly useful in understanding the value created for members and could be adapted to include value-creation outside of the CoP/KN, thereby promoting a greater understanding of the social, health and environmental impacts. Meessen and Bertone’s (2012) knowledge-focused framework brings in potentially relevant long-term goals of influencing knowledge-based policy decisions and practices and better health outcomes.

While the reviewed frameworks provide useful starting places, the specific needs of ecohealth evaluations cannot be met by simply applying one of the frameworks. For example, the members of the CoPEHs hold a number of roles; these include researcher, trainee/student, ecohealth practitioner, and funder. Many of the frameworks in this review did not include approaches for heterogeneous membership. This is not surprising as homogeneity has been used as a characteristic to describe CoPs (Fischer, 2001), and many of the frameworks came from within organizations with less heterogeneity. Notably, transdisciplinarity was not broached in the reviewed frameworks. Therefore, one would need to look elsewhere to answer questions regarding the measurement of transdisciplinarity outcomes, such as the cross-fertilization of ideas.

Acknowledging the diversity of CoPs and KNs implies acknowledging a required equal diversity in approaches to their evaluation. While some of the frameworks reviewed here provided enough detail (including data collection tools), it would be inappropriate to apply any tool without considering community type (e.g., as outlined by Dubé, Bourhis, and Jacob (2006) in their typology of virtual CoPs), the learning needs of the community, the key evaluation questions, and the desired application of evaluation processes and results. Future research should explore how evaluation frameworks, methods, and approaches can complement particular types of CoPs and their objectives, thereby informing insights on how best to evaluate a particular CoP or KN. An exploration that matches frameworks to CoPs could be useful in answering questions such as, ‘Are there key outcomes that should be measured in the early stages (e.g., relationship building)
that are less relevant after a CoP is well established?’ or ‘What approaches are best for dispersed multinational, multi-linguistic networks, such as several of the CoPEHs?’

3.5.3 Strengths and Limitations

This review builds on existing literature and can inform practices of the CoPEHs, as unique CoPs. A recent article by Bertone et al. (2013) reports findings from a scoping review of frameworks for assessing CoP performance that would inform a transnational health policy CoP evaluation model. The reviews differ in the methods used; Bertone et al.’s (2013) search methods were not systematic or exhaustive, they based their criteria for inclusion on relevance to a research question that was defined post hoc. In addition to assessment frameworks, Bertone et al. (2013) also included literature on limitations and success factors of CoPs. While there is some overlap with frameworks in this review, our review examined a broader scope of evaluation frameworks from multiple disciplines and explicitly dealt with the testing of evaluation frameworks. Two other systematic reviews of CoP-related topics exist. Li et al. (2009b) examined the definition and use of CoPs in the health and business sectors, and the effectiveness of CoPs in the health care sectors; however, the authors were not able to find studies that met their criteria for determining CoP effectiveness. Ranmuthugala, Plumb, et al. (2011) looked at how and why CoPs are established in the health care sector; however, their review did not focus on evaluation, but did conclude with a call for use of evaluation to assess the role of CoPs in health care.

The strengths of this review are in the systematic nature of the search, data extraction, and assessment of the utility of the results as a starting point for future evaluations of CoPs in ecosystem health. This review is limited, as not all potentially useful frameworks or measures could be included. Lessons could be gained from frameworks that focus on networks of organizations rather than individuals (e.g., Creech & Ramji, 2004) or that focus on other forms of collaborative partnerships, such as research networks (e.g., Fenton, Harvey, & Sturt, 2007). Furthermore, books are also potential sources of guidance in evaluating CoPs and KNs; for example, Stein et al. (2001) highlight important evaluation questions for knowledge networks to consider.
3.5.4 Conclusion

This scoping review synthesized current evidence that can inform the evaluation practices of any CoPs or knowledge networks. The systematic scoping review methodology allowed for a breadth of framework exploration. The review provides a base of conceptual frameworks, data collections tools, indicators, analytical approaches, and key considerations. Although application of the frameworks to the CoPEHs will vary, one can glean insights from each. With the current emphasis on networked knowledge exchange and capacity building, it is important to understand the potential costs and benefits of CoPEHs as learning networks, and the ways in which benefits can be maximized. By understanding the value of CoPs and the ways in which they work, ecohealth researchers and practitioners will be able to improve knowledge exchange and mutual learning, towards the shared goal of societal benefit.
Chapter 4
A framework for evaluating extra-organizational communities of practice

4 Paper 2

4.1 Abstract

Communities of practice (CoPs) are increasingly acknowledged as critical components of sectors such as health care, education, and management. Although the potential for CoPs to promote learning, knowledge mobilization, and other benefits, is recognized, limited research exists on evaluating CoPs. In particular, when considering their organizational context (inter, intra or extra-organizational), there is a scarcity of research and evaluation on extra-organizational CoPs. In addition, the evaluation frameworks proposed in the literature were not fully applicable to extra-organizational communities of practice, which led us to develop a framework adapted to this type of CoP. We developed a framework to address the limitations of current CoP evaluation frameworks and help guide evaluations of extra-organizational CoPs. When applying the proposed framework, evaluators will be guided to consider multiple levels of analysis. The framework is comprehensive and can be used to support formative or summative evaluations. The evaluation framework can be modified and elaborated to suit the specific needs of a particular community of practice. We explore potential applications of the evaluation framework and the insights gained by acknowledging the types of value and levels of analysis.

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Un cadre d'évaluation pour des communautés de pratique extra-organisationnelles

French Abstract

Les communautés de pratique (CP) sont de plus en plus reconnues comme des composantes essentielles de secteurs tels que les soins de santé, l'éducation ou la gestion. Bien que l’on reconnaisse le potentiel des CP pour favoriser l’apprentissage, la mobilisation des connaissances ou apporter d’autres bénéfices, il existe peu de recherche sur l'évaluation des communautés de pratique. En particulier, lorsqu’on considère leur contexte organisationnel (inter, intra ou extra-organisationnel), on constate la rareté des études portant sur les CP extra-organisationnelles. De surcroît, les cadres d’évaluation proposés dans la documentation scientifique sont limitées quant à leur application aux communautés de pratique extra-organisationnelles. Les communautés de pratique extra-organisationnelles, ce qui nous a conduit à développer un cadre adapté à ce type de communauté. Le cadre proposé invite à tenir compte de plusieurs niveaux d'analyse; il est englobant et peut être utilisé pour soutenir des évaluations formatives ou sommatives. Le cadre est aussi flexible et peut être aisément modifié pour répondre aux besoins d’une communauté de pratique donnée. Dans cet article, nous présentons ce cadre d’évaluation, explorons ses applications potentielles et dégageons ses apports notamment en regard de la considération de types de valeur et de niveaux d'analyse.
4.2 Introduction

Communities of practice (CoPs) are increasingly acknowledged as critical components of sectors such as health care, education, and management (Li et al., 2009b; Ranmuthugala, Plumb, et al., 2011; Tight, 2015). Many professionals, including health practitioners and researchers, participate in multiple and sometimes overlapping CoPs. CoPs are learning communities; that is, they comprise groups of people who interact over time to share knowledge and expertise about common practices, problems, or topics (Wenger et al., 2002). CoPs bring together individuals with interests in sharing knowledge, and building common practices. Some CoPs bring together individuals from within an organization, and others link people from across organizations whether these individuals act as representatives of their organization or independently of their organizational affiliations.

CoPs are seen to have a variety of possible benefits. CoPs show promise as mechanisms by which to learn; specifically, they can offer a way to translate and share tacit knowledge or ‘know how,’ which can be a valuable resource for capacity building (Buckley & Du Toit, 2010; Wenger, 1998b). They can also support learning by newcomers to a field (Lave & Wenger, 1991). CoPs also show promise as a way to translate knowledge into action, for example disseminating guidelines and implementing evidence-based practices (Barwick et al., 2009; Tolson, Lowndes, Booth, Schofield, & Wales, 2011). CoPs can provide opportunities for the breaking down of professional barriers or organizational barriers (Ranmuthugala, Plumb, et al., 2011). Roberts (2006) suggests that the role extra-organizational CoPs play in knowledge creation and transfer will be increasingly important. These potential benefits have led to increased international interest in CoPs and attempts to foster CoPs in multiple sectors.

Studies to date have focused primarily on learning, knowledge management, or value in an organizational setting. Evidence in studies to date includes a sense of community being positively linked to knowledge sharing (Nistor, Daxecker, Stanciu, & Diekamp, 2015), and management support relating to interactions within an intra-organizational CoP (Zboralski, 2009), but not directly to knowledge sharing (Hu & Randel, 2014). There is also some evidence showing the overall effect of CoPs; for example, in the healthcare sector, networked approaches may improve care services (Mitchell, Long, Braithwaite, & Brodaty, 2016). However, we are still unclear as to the mechanisms and context that foster such effects. This may be partially
because there has been little evaluation of CoPs (Bertone et al., 2013; Li et al., 2009b; McKellar et al., 2014), and little research on evaluating the ways in which they might produce such outcomes.

A review of evaluation frameworks for CoPs and knowledge networks revealed that, while existing frameworks are useful starting points, they do not fully address the complexity and variability of CoPs (McKellar et al., 2014). While broadly speaking, CoPs all have a shared passion and learning agenda, their areas of focus can influence their form and processes. For example, Amin and Roberts (2008) characterize the types of knowing in action which shape group identities and organizational dynamics of a particular CoP. Furthermore, given that setting can be highly influential for CoPs, it may be problematic that the majority of evaluation frameworks were designed for evaluating for profit, intra-organizational CoPs (McKellar et al., 2014). Few evaluation frameworks have been proposed for CoPs that cross organizational boundaries. Evaluation frameworks for CoPs located within organizations may have different ways of defining success (e.g., organizational performance or sharing information relevant to community objectives (Kirkman, Mathieu, Cordery, Rosen, & Kukenberger, 2011)). They may have different factors contributing to their success (e.g., management support, status within an organization (Kirkman et al., 2011)), or have different evaluation priorities (e.g., demonstrating financial return on investment or aligning with institutional goals) (Bond & Lockee, 2014) as compared to extra-organizational CoPs.

Greater evaluation of CoPs is an important step towards understanding how they work and how they could be more effective, document their value, and promote their sustainability (Wenger et al., 2002). Evaluation can help programs or organizations to be more strategic and deliberate, help to make a case for continued funding and support, and help to build relationships with stakeholders (Carman, 2013). However, even as the literature on CoP evaluation has expanded (e.g., Francis-Coad et al., 2018; Richard et al., 2014; Wenger-Trayner, 2014), comparatively little evaluation research focuses on extra-organizational CoPs compared to intra-organizational CoPs. Because the work and learning of extra-organizational CoPs occurs outside of an organization, the value of these CoPs is often unrecognized, and the work of individual members is often not acknowledged. To gain a better understanding of how best to evaluate CoPs, there is a need for an evaluation framework that is suitable for the nature, context and goals of extra-
organizational CoPs to assist in understanding how they work and how they can be more effective.

In this article, we start by summarizing the characteristics of CoPs and current approaches to evaluating CoPs. We then propose a framework to help guide evaluations of extra-organizational CoPs. The development of the framework involved the collection and analysis of information gathered from a number of sources: a review of empirical research on CoPs, a scoping review of evaluation frameworks for CoPs and knowledge networks (McKellar et al., 2014), consultations with CoP members interested in self-evaluation and insights from the authors’ participation in CoPs. This included an iterative process of applying concepts within the framework by mapping evaluation questions and statements of CoP value onto the framework and modifying for conceptual consistency. The proposed evaluation framework offers a typology of possible value generated by CoPs. While not a program theory or schema to understand how CoPs work, it can guide a systematic exploration of the benefits generated by CoPs as well as the mechanisms that drive extra-organizational CoPs. The proposed evaluation framework has the potential to address the goals of CoPs and facilitate the work of evaluators in understanding and assessing them. As CoPs are largely dynamic and complex, the aim was not to create a framework limited to summative judgments but rather to ensure it was also supportive of multiple approaches to evaluation, including formative evaluations. We conclude by considering the potential applications of the evaluation framework and the insights gained by recognizing the types of value and levels of analysis.

4.3 Background

4.3.1 Communities of practice

While there are many ideas presented as part of CoP theory, three dimensions of CoPs are commonly used to define them. Two sets of terms are used to describe these three elements: mutual engagement, joint enterprise, and shared repertoire from Wenger’s (1998b) work on the structures and processes of the CoPs concept; and community, domain, and practice which overlap respectively and are used in more recent work, starting with Wenger et al. (2002). Community or mutual engagement is used to represent how the participants interact to learn and build meaning along with a sense of belonging. The terms domain, or joint enterprise, can be understood as the common ground for CoP members that inspires participation and guides
learning. *Practice*, or *shared repertoire*, is the body of shared knowledge and resources that enable a CoP to efficiently focus on, and advance, its domain (Wenger et al., 2002). These are a resource for negotiating meaning (Wenger, 1998b), in the form of ideas, tools, documents, or stories, which together define practice. These three elements—community, domain, and practice—represent mutually reinforcing aspects of participation that motivate people to engage with a CoP (Wenger et al., 2002). These concepts are relevant to understanding CoPs regardless of their organizational location. For example, as Wenger elaborates, “[Practice] exists because people are engaged in actions whose meaning they negotiate with one another” (Wenger, 1998b, p. 73).

The concept of community of practice has been used, adapted and applied in many fields and settings and its usage has changed since the term was originally coined in 1991. It has also shifted from being solely theoretical, as a tool for the analysis of social learning and practice, to instrumental, where it is conceptualized as a technique or something that can be cultivated (Kislov et al., 2011). This shift in framing corresponded with a new focus on the value of CoPs in contributing to the success of organizations. In this article, we define CoPs as a group of people engaging with each other around a negotiated enterprise in a way that promotes learning. By using this definition, the proposed evaluation framework will be aligned with the most common conception of CoPs.

**4.3.2 Organizational setting as a typology of CoPs**

Here, the term *organizational* refers to the setting of the CoP and not the degree to which they are organized or formalized. While the literature has largely focused on intra-organizational CoPs, starting with seminal works (e.g., Brown & Duguid, 1991) and continuing more recently (e.g., Agrawal & Joshi, 2011; Kirkman et al., 2011), a number of papers have also focused on inter-organizational CoPs (e.g., Moingeon, Quélín, Dalsace, & Lumineau, 2006; Soekijad, Huis in't Veld, & Enserink, 2004). There has been relatively limited focus on extra-organizational, although the term has occasionally been used (Murillo, 2012; Roberts, 2006). It is worth noting that the terminology of CoPs varies, for example intra-organizational CoPs have been referred to as *internal CoPs* (Scarso et al., 2009), inter-organizational as *extended CoPs* (Jakubik, 2008), and extra-organizational as *external CoPs* (Peansupap & Walker, 2005). *Cross-organizational CoPs* could be either inter- or extra- CoPs depending on the focus of the organizations. Intra, inter- and extra-organizational CoPs will be used here.
CoPs that occur within an organization and are comprised of professionals from that same organization (firm or institution) are *intra-organizational* CoPs. A CoP is considered intra-organizational whether or not its domain directly aligns with the mandate supported by the organization. CoPs can form without external intervention, however, organizations have made attempts to support, foster, or initiate CoPs to leverage their potential value in improving knowledge management and organizational performance. Inter-organizational CoPs are those where various organizations (including potential competitors) cooperate, and members combine different organizational interests (Soekijad et al., 2004). CoPs that are comprised of professionals that are not necessarily representatives of an organization and are from multiple organizations are *extra-organizational* CoPs. The term *extra-organizational* de-emphasizes the formal institution or firm. The focus is not on partnerships between organizations, but on the partnerships between individuals who may or may not be a part of an organization. Extra-organizational CoPs are open to those willing to participate, and are not governed by a particular organization/firm.

The benefit in creating this typology is that it draws attention to the organizational context of a CoP as a key factor that shapes the characteristics of a CoP and approaches to its evaluation.

**4.3.3 A closer look at structures of existing CoP evaluation frameworks**

Proposed evaluation frameworks for communities of practice have been developed for various purposes: some have attempted to understand how CoPs work, others have sought to assess if they work, and in some cases, the frameworks have included both purposes (McKellar et al., 2014). These frameworks offer a way of conceptualizing the evaluation; they can also include guidance on data collection. This brief review examines the structures or different dimensions used in evaluation frameworks for CoPs. We first focus on levels of analysis used within evaluation frameworks for CoPs. We then touch on process/outcome type structures before taking a closer look at one such framework, the Value Creation Framework, including how the level of analysis aligns with it.

Exploring multiple levels of analysis or different scales of impact is one strategy that an evaluation framework could use to categorize the processes or outcomes of evaluands. Consideration of level of analysis is also found in other evaluation literature; Mark and Henry (2003; 2004) focus on individual, interpersonal and collective levels in outlining a framework to understand evaluation influence. Levels of analysis introduce a multi-scale perspective to
evaluating CoPs. McKellar et al. (2014) found that only five of 16 evaluation frameworks for CoPs and knowledge networks incorporated levels of analysis. By not starting with a full consideration of multiple levels of analysis, evaluators may not capture the possible outcomes of a CoP, conflate processes and outcomes that occur at distinct levels, or overlook the multiple mechanisms at play at different levels. Without a more systematic exploration of the different levels of analysis, evaluators and CoP members may turn to more individualistic approaches to evaluation, despite CoPs being collective entities. Kothari et al. (2015) note that there are limited examples showing the influence of CoPs beyond influence on CoP members themselves.

Evaluation frameworks for intra-organizational CoPs often recognize three levels of analysis of relevance: individual, community (of practice) and organization (McDermott, 2002; Millen, Fontaine, & Muller, 2002; Verburg & Andriessen, 2006; Yap & Robben, 2012). For others, the individual and organization/firm are common levels of focus (Moingeon et al., 2006). Examples of levels of analysis in extra-organizational knowledge networks or CoPs, include implementation/practice site (common to healthcare-related CoPs), the CoP and broader knowledge network levels (of which the CoP is a part) (Conklin & Stolee, 2008); or the CoP, organization, and system (Richard et al., 2014). As argued here and by Abma (2007), evaluations of CoPs should incorporate other levels of analysis such as the collective/CoP and the learning environment that it creates. A systematic consideration of the levels of analysis that includes the collective/CoP level is important in understanding the processes, mechanisms, and potential outcomes that are experienced by CoPs (Renger, Foltysova, Becker, & Souvannasac'd, 2015).

Additional levels may help in getting a more comprehensive sense of the value of CoPs, particularly for extra-organizational CoPs. The field in which the CoP is engaged is important to consider, particularly for CoPs involved in epistemic/creative knowing-in-action (Amin & Roberts, 2008) such as research-oriented CoPs, which operate in an area of scholarly inquiry and can foster innovation and development of the field. Furthermore, as not-for-profit entities, CoPs should consider their external stakeholders (C. Lee & Nowell, 2015). Who the external stakeholders are (normally those outside of the organization, but in this case external to the CoP) will be highly dependent on the CoP. Taking the example of CoPs in the health care sector, CoPs can be tasked with system change (Kothari et al., 2015), therefore the health care system, or parts such as front line caregivers, would be of particular importance. Currently, evaluation frameworks are ill equipped to build evidence of CoPs’ influence on the systems within which
they operate (Kothari et al., 2015). Additionally, as health care CoPs have shifted from their focus on learning and knowledge exchange to value for clinical practice, an important stakeholder group to consider is health service users.

A number of existing frameworks set out categories of processes, mechanisms, and outcomes when evaluating CoPs, although the specific structure varies widely in evaluation frameworks of CoPs and knowledge networks. Some of these frameworks focus on common concepts in evaluation; for example using characteristics, processes and outcomes (Verburg & Andriessen, 2006); or inputs, mediators (processes and emergent states); and outcomes (Richard et al., 2014). Although they have common components, the way these frameworks define and operationalize outcomes differs. Wenger et al. (2011), proposed an alternative way of framing CoP processes and outcomes as “value-creation cycles” in their Value Creation Framework. They defined value creation as “the value of the learning enabled by community involvement and networking” (Wenger et al., 2011, p. 1). The value creation cycles include concepts of input, process, output, intermediate outcome and longer-term outcome in outlining the possible value created by a CoP. This framework has been extended (Wenger-Trayner, 2014), incorporated as a component of other CoP evaluation frameworks (e.g., Creech et al., 2012; Yap & Robben, 2012), and applied in different fields since its development (e.g., Bertram, Culver, & Gilbert, 2016; Booth & Kellogg, 2014; Guldberg, Mackness, Makriyannis, & Tait, 2013; Hanley, Baker, & Pavlidis, 2018).

The Value Creation Framework is worth exploring further due to its potential for both rigor and flexibility. In developing the Value Creation Framework, Wenger et al. (2011) adapted Kirkpatrick’s (1976, 1994) four-stage model for the evaluation of professional development within organizations. Kirkpatrick’s model suggests components of an evaluation: reaction (e.g., to training), learning, behaviour and results. While there is some logic to the Kirkpatrick model, the linkages between stages are not clearly articulated and have not been validated by research (Alliger & Janak, 1989; Holton, 1996, 2005). Furthermore, while perhaps suitable for professional development training within organizations, it does not address the complexity of CoPs. Wenger et al. (2011) partially address this by expanding the value creation included in the framework and attempting to make the theory of change more explicit (Wenger-Trayner, 2014). We expand on our description of the Value Creation Framework as we introduce our proposed evaluation frameworks for extra-organizational CoPs as further adaptations to this model could
provide an evaluation framework for CoPs, in general, and extra-organizational CoPs, in particular.

Looking at the Value Creation Framework through the lens of level of analysis, we see Wenger et al. (2011) introduce individual and collective narratives. Despite this, multiple levels of analysis are not systematically included in their evaluation framework (Wenger et al., 2011). The Value Creation Framework and its applications (e.g., Bertram et al., 2016; Booth & Kellogg, 2014), as well as the Kirkpatrick model (1994) from which it was adapted, are largely individual, looking at the effects on CoP members, with insufficient attention to the collective value. It is not until the model addressed realized value (or results in the Kirkpatrick model) where there is a move to other levels of analysis, namely the organization. While collective value is considered a part of potential and reframing value, it is not clear why it is absent in other value creation cycles. Looking at Wenger’s other works, Wenger and colleagues’ (2002) book, Cultivating Communities of Practice, does acknowledge that value can be gained by different stakeholders, particularly organizations, business teams, and CoP members themselves. However, it is not clear how the different types of value are aligned with or experienced at these levels.

4.4 Proposed levels of analysis for extra-organizational CoPs

In addition to the three levels of analysis noted in intra-organizational CoPs (individual, collective and organizational/institutional), extra-organizational CoPs can make contributions to their domain and the field in which they are embedded, which are important considerations in looking at the broader impacts of a CoP. Extra-organizational CoPs are themselves a form of organization, so there is a need to consider their external stakeholders (C. Lee & Nowell, 2015). Hence there are five levels of analysis in our proposed framework. To help explain the different levels of analysis, Figure 4.1 represents the levels at which value occur and how these levels relate to each other.
Figure 4.1 Schematic of links between proposed levels of analysis, about here

Legend: i represents individual, O represents organizations, and ES represents external stakeholders (which can be either individuals or organizations). The green lines between individuals and between organizations represent connections between them. The dotted line surrounding CoP and Field indicates that these may not have clear boundaries.
Starting with individuals or members of the CoP ($i$), we see that they are linked to other individuals. Individuals can be a part of one or more organizations ($O$), and their relationships to organizations differ. Members can operate independently of organizations, may be more central to an organization (e.g., in a leadership role), or may be loosely associated (e.g., part-time contract worker). Organizations are of different sizes, levels of power, and levels of alignment with CoPs. Some organizations will have multiple members associated with a CoP, while others will have only one. Level of involvement in the CoP will also differ; some organizations may play a major role in the CoP (e.g., encouraging members’ participation, offering support) while others play more limited roles. The CoP is represented with a dashed border because the boundaries of a CoP are often not clear. Individuals not within the CoP are still considered as a level of analysis; however, they are represented as external stakeholders ($ES$). External stakeholders may include people or organizations that are linked to the CoP, and stand to benefit, but are not themselves part of it (as defined by the members). All of these are within an identified field, which is a branch of study or sphere of interest. The field, like CoPs, can have imprecise boundaries and the border is therefore, represented as a dashed line. CoPs, organizations and people do not necessarily operate within a single field. The levels of analysis highlight the nested nature of CoPs and their components.

4.5 Proposed extra-organizational evaluation framework

As frameworks, to date, have omitted full consideration of all relevant levels of analysis and types of value for extra-organizational CoPs, our proposed framework is multi-dimensional, incorporating the five levels of analysis described above and a typology of the value generated by CoPs. Our focus is on the effects of the CoP (e.g., learning), and not the inputs associated with supporting and participating in the CoP. In a sense, the proposed framework sets out to capture the impacts of the CoP, noting that certain impacts can cause or contribute to others. The proposed framework has two key dimensions for which the value of a CoP is considered. These are, type of value, which includes the different ways of looking at the outputs, emergent states, mechanisms, and/or outcomes related to a CoP; and level of analysis, that is, who or what is being influenced or is experiencing effects from the value created.

The type of value is adapted from Wenger et al.’s (2011) Value Creation Framework. While, similar to Wenger et al.’s (2011), here, type of value is used as an encompassing term, not solely
reflective of economic value. The term *outcomes* may also have been appropriate; however, value is considered to be a broader term encompassing different outputs, emergent states, underlying processes, intermediary outcomes, and long-term outcomes.

Although the proposed framework provides a grid of discrete categories of value generated by CoPs, these do not always happen in isolation from each other; there may also be cyclical effects. For example, individual personal goals can be a reason for participating in a CoP where they influence collective action and the CoP can, in turn, influence those goals. Additionally, certain aspects of participating in a CoP may have both positive and negative effects (e.g., disagreements between members), and these would be considered within the framework. Table 4.1 provides an outline of the levels of analysis and types of value. Within each of the cells, illustrative clarifying examples from a review of CoP and evaluation literature are offered. The following sections provide detail on the levels of analysis and types of value.
<table>
<thead>
<tr>
<th>Type of Value</th>
<th>Motivation and Participation</th>
<th>Relational</th>
<th>Knowledge and cognitive</th>
<th>Tangible</th>
<th>Intangible</th>
<th>Learning</th>
<th>Applied</th>
<th>Realized /Outcomes</th>
<th>Reframing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level of Analysis</strong></td>
<td><strong>Individual (members)</strong></td>
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<tr>
<td></td>
<td>• Personal goals &amp; aspiration</td>
<td>• Connections to other members</td>
<td>• Skill building</td>
<td>• Access to tools and resources</td>
<td>• Recognition by home institution/organization</td>
<td>• New skill performance (Mark &amp; Henry, 2004)</td>
<td>• Personal performance improvement</td>
<td>• New definition of success</td>
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<td></td>
<td>• Members’ enjoyment</td>
<td>• Types of relationships (Wenger et al., 2011)</td>
<td>• Skill acquisition (Mark &amp; Henry, 2004; Wenger et al., 2011)</td>
<td>• Improved reputation from participation (Wenger et al., 2011)</td>
<td>• New views of learning (Wenger et al., 2011)</td>
<td>• Individual change in practice (Mark &amp; Henry, 2004)</td>
<td>• Career performance and opportunities</td>
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<td></td>
<td>• Perceived personal pay-offs</td>
<td>• Level of trust (Wenger et al., 2011)</td>
<td>• Improved understanding of domain</td>
<td>• Sense of support</td>
<td>• Transformed ability to learn (Wenger et al., 2011)</td>
<td>• Use of tools and documents to inform practice (Wenger et al., 2011)</td>
<td>• New definition of success</td>
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<td></td>
<td></td>
<td>• Sense of obligation and identification</td>
<td>• New ideas (Wenger et al., 2011)</td>
<td></td>
<td>• Identification of new opportunities for learning (Wenger et al., 2011)</td>
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<td></td>
<td></td>
<td>• Knowledge of others</td>
<td>• Change in perspective (Wenger et al., 2011)</td>
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<td>• Learning energy</td>
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<td></td>
<td></td>
<td>• Social reward (Mark &amp; Henry, 2004)</td>
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<td></td>
<td><strong>Collective (CoP)</strong></td>
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<td></td>
<td>• Collective desire</td>
<td>• Network of connections</td>
<td>• Collaborative repertoire</td>
<td>• Reputations of CoP</td>
<td>• Transformed ability to learn together</td>
<td>• Goal achievement (Mittendorff et al., 2006)</td>
<td>• Community aspirations</td>
<td>• New definition of success</td>
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<td></td>
<td>• Response to pressure (Ng &amp; Pemberton, 2013)</td>
<td>• Structural shape of networks (Wenger et al., 2011)</td>
<td>• Capacity to address the challenges of complex systems</td>
<td>• Collaborative capacity</td>
<td>• Transformed ability to work together</td>
<td>• New discourse about value</td>
<td>• New discourse about value</td>
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<td></td>
<td>• Incentives created for participation</td>
<td>• Connections to other CoPs, forming constellations of practice (Wenger et al., 2002)</td>
<td>• Development of tangible resources (documents, tools, procedures) to inform practice (Wenger et al., 2011)</td>
<td>• Shared repertoire</td>
<td>• Reflective practices</td>
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<td></td>
<td>• Norms (Mark &amp; Henry, 2004) (injunctive or descriptive)</td>
<td>• Shared vision</td>
<td>• Spirit of inquiry</td>
<td>• Learning energy</td>
<td>• Collaborative change in practice (Mark &amp; Henry, 2004)</td>
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<td></td>
<td></td>
<td>• Development of norms</td>
<td>• Innovations in practice (Wenger et al., 2011)</td>
<td>• New skill performance (Mark &amp; Henry, 2004)</td>
<td>• Team innovation</td>
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<td></td>
<td></td>
<td>• Safe environment</td>
<td>• Movement towards collaborative research</td>
<td>• Individual change in practice (Mark &amp; Henry, 2004)</td>
<td>• Innovations in practice (Wenger et al., 2011)</td>
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<td></td>
<td></td>
<td>• Community cohesion</td>
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</tr>
</tbody>
</table>

Table 4.1 Proposed extra-organizational CoP evaluation framework with examples of value generated by CoPs
<table>
<thead>
<tr>
<th>Organization / Institutions</th>
<th>• Motivated workforce</th>
<th>• Connections between organizations (break down professional and organizational barriers) (Ranmuthugala, Cunningham, et al., 2011)</th>
<th>• Agenda setting (Mark &amp; Henry, 2004)</th>
<th>• Possible access to resources (Wenger et al., 2011)</th>
<th>• Improved reputation of organization (Wenger et al., 2011)</th>
<th>• Transformed ability to learn from the CoP (Wenger et al., 2011)</th>
<th>• Innovation in systems (Wenger et al., 2011)</th>
<th>• Organizational performance (Wenger et al., 2011)</th>
<th>• Institutional changes (new strategic directions that reflect the new understanding) (Wenger et al., 2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Stakeholders</td>
<td>• Motivated to engage with CoP</td>
<td>• Connections to stakeholders facilitated by CoP (community members, policy makers)</td>
<td>• Agenda setting (Mark &amp; Henry, 2004)</td>
<td>• Policy oriented learning</td>
<td>• Possible access to resources (Wenger et al., 2011)</td>
<td>• Transformed ability to learn from the CoP</td>
<td>• Innovation in systems (Wenger et al., 2011)</td>
<td>• System oriented change (imprint on policy, social environment) (Hearld, Bleser, Alexander, &amp; Wolf, 2016)</td>
<td>• Relationships with stakeholders (different conversations, involvement of new stakeholders) (Wenger et al., 2011)</td>
</tr>
<tr>
<td>Field</td>
<td>• Facilitated collaboration</td>
<td>• Environment (easier for networks to develop in the future)</td>
<td>• Development of the domain of knowledge</td>
<td>• Possible access to resources (Wenger et al., 2011)</td>
<td>• Status of the field</td>
<td>• Transformed ability to learn together</td>
<td>• Change in practice of members of the field</td>
<td>• Higher performing members of the field.</td>
<td>• Paradigm shift</td>
</tr>
</tbody>
</table>
4.6 Levels of analysis

Within the evaluation framework, the ordering of the levels of analysis, starting at the top with individual, and then working towards larger or more distant groups, reflects the levels at which process and impacts can occur. While each level is represented by one row in the proposed evaluation framework (Table 4.1), the framework can be adapted to represent the structure of particular CoPs. For example, one can adapt the framework to include multiple specific stakeholders or focus on core (centrally connected and engaged) and peripheral (loosely connected, infrequent participation) stakeholders at each level. We turn to a description of each level.

4.6.1 Individual

This represents the value for individual members (people) of the CoP. The base model includes one level to represent individuals within the CoP; however, depending on the characteristics of the CoP to which it is being applied (e.g., size, homogeneity of members), the evaluator could instead consider core and peripheral members or other types of individuals that are involved with the CoP. Given that there are different ways and degrees of participating, there could therefore be different types of members included in the framework. The individual level of analysis is most common in other CoP evaluation frameworks and is perhaps easiest to conceptualize.

4.6.2 Organization

While this framework provides guidance for extra-organizational CoPs, members’ organizations should be considered with respect to the value created by CoP processes. Despite extra-organizational CoPs not being housed within a single organization, and therefore less likely to receive organizational support, we can still expect to see value for most organizations to which CoP members belong (e.g., members bring back new skills to share with colleagues or other CoPs within the organization). Some organizations may also fund or support extra-organizational CoPs (e.g., Fung-Kee-Fung et al., 2008). The value to the organization, such as building their internal knowledge assets, may depend on intentional actions of the organization to leverage their access to CoPs (Roberts, 2006, p. 635).
4.6.3 Collective

Here we are looking at the collective value for the CoP as a whole or unit. There are both individual and collective manifestations in the motivations and processes of CoPs, therefore it follows that the outcomes of participation also occur at the individual and collective level (Wakefield & Dismore, 2015). Early literature in CoPs (Lave & Wenger, 1991) promotes the collective as a unit of analysis (Hughes, Jewson, & Unwin, 2013), and Wenger (1998b) specifies that joint enterprise is considered a collective product.

4.6.4 External stakeholders

The level of external stakeholder is unique because it can represent individuals, organizations or target populations of the CoP. Stakeholders are actors (persons or organizations) with a vested interest (Schmeer, 1999); external stakeholders being those outside of the organization or CoP in this case (Brugha & Varvasovszky, 2000). The distinction with this level of analysis is that they are external to the CoP, and the value gained is a result of the practices of the CoP. When determining which external stakeholders to consider in the evaluation, attention needs to be paid to the goals and strategy of the CoP, in particular, who or what group(s) is/are the CoP trying to influence, and what organizations are closely connected to the CoP. For example, evaluators might include the health care system as the focus for this level of analysis if relevant for the CoP. Robust techniques, such as stakeholder analysis, can be used to determine where external stakeholders attention should be focused (Brugha & Varvasovszky, 2000).

4.6.5 Field

The field is related to the subject, issue or topic in which members share an interest or passion (i.e., related to the CoP’s domain) (e.g., Saint-Charles, Webb, et al., 2014). The field is comprised of both codified knowledge (i.e., formalized, written, archived), emergent knowledge, represented in the ongoing work of researchers and practitioners active in the field, and tacit knowledge, held by individuals; all of these elements both comprise the field and contribute to its evolution. The field is related to the concept of domain for a community of practice, where the latter (CoP) is subsumed within the former. A community of practice can also contribute to the development of a field (Saint-Charles, Webb, et al., 2014).
4.7 Types of value

The types of value laid out in the framework draw heavily from Wenger et al.’s (2011) Value Creation Framework for promoting and assessing value created in communities and networks, with some modifications. We provide an overview of Wenger et al.’s (2011) types of value (value creation cycles), followed by a description of our modifications. The Value Creation Framework provides a way of categorizing generated value. This includes five types of value: immediate value, encompassing the idea that CoP activities and interactions have their own value, which is likened to satisfaction; potential value, which Wenger refers to as “knowledge capital” but which has included other forms of capital including social capital; applied value, representing changes in practice and leverage of potential value; and realized value, the outcomes of the practice change or applied value; and reframing value, defined as a “reconsideration of learning imperative and criteria by which success is defined” (Wenger et al., 2011, p. 21).

In the proposed framework, immediate value has been replaced with motivational and participation value, to capture both participation as well as reaction to the event. Immediate value was likened to satisfaction, but satisfaction can come from either the social rewards of participating in a CoP activity or from the collaborative learning that takes place. Immediate value was also defined as connecting with people, which overlaps aspects of the framework (relational value) (Wenger et al., 2011). Motivation is a key driver of participation in communities of practice (Thompson, 2005; Zboralski, 2009), therefore in this model it replaced immediate value. While types of value appear in separate columns, they are not entirely mutually exclusive. Moving from left to right generally reflects changes in the temporal nature of the value. The time-span of outcomes needs to be considered when conducting an evaluation. We turn to a description of each type of value.

This evaluation framework uses the term value, not to align the framework with economic or management evaluation, but to select a more encompassing term. The term outcomes may also have been appropriate; however, value is considered to be a broader term encompassing different outputs, emergent states, underlying processes, intermediary outcomes, and long-term outcomes. Additionally, this term reflects the language of Wenger et al.’s (2011) Value Creation Framework, from which the types of value were adapted.
4.7.1 Motivation and participation value

This value refers to the motivational response of engaging with the CoP. It can include goals and aspirations, or positive feelings from participation. Motivation is an important intermediate outcome as it can drive further participation and development of practice. A “virtuous circle” involving motivation and participation has been used as a defining characteristic of CoPs (Thompson, 2005). Examples would be individual or collective goals and a motivated workforce, perceived personal pay-offs or norms at the collective level. At a member level, the source of motivation could be, for example, a strengthened social relationship, or a new skill developed by engaging in a CoP.

4.7.2 Relational value

Relational value includes both structural and relational aspects of social capital (Nahapiet & Ghoshal, 1998) reflected in the number and quality of connections and the structure and knowledge of the community. Relational value can facilitate or limit other types of value; for example, trust plays a role in willingness of members of a network to share knowledge (Inkpen & Tsang, 2005). Making connections and being able to identify subject matter experts can help speed knowledge transfer (Lesser & Storck, 2001).

4.7.3 Knowledge and cognitive value

Knowledge and cognitive value includes knowledge and skill regarding the domain and practice. Knowledge is commonly conceptualized in two forms, tacit knowledge (‘know how’) and explicit knowledge (‘know that’) (Polanyi, 1966; Ryle, 2009). CoPs share both types of knowledge (Brown & Duguid, 2001) and their advantage is often seen as facilitating tacit knowledge exchange (e.g., Buckley & Du Toit, 2010). We see this as related to cognitive social capital (which focuses on the shared meaning and understanding that individuals or groups have with one another (Nahapiet & Ghoshal, 1998). This, in addition to the social capital captured in relational value, has been linked to team innovation (Hu & Randel, 2014).

4.7.4 Tangible value

Tangible assets are similar to the shared repertoire of the CoP. These can include documents, tools, procedures and methods. In some cases they will be similar to the output of the CoP. Value for the different levels includes access to researchers and their codified knowledge.
4.7.5 Intangible value

Intangible value is related to what Wenger et al. (2011) refer to as collective intangible assets. This includes a sense of support from the CoP, as well as reputational value. Examples include the status of an individual, the reputation of the CoP, its collective voice or the salience of the domain.

4.7.6 Learning value

Learning value is more process-oriented than knowledge and cognitive value. It includes learning about how to work collaboratively and the development of strategies concerning the CoP. It includes reflective processes. This reflection facilitates an understanding of the state of the development from multiple perspectives; self-awareness can be leveraged to move forward (Wenger, 2000). Learning is central to CoP theory and is connected to other factors important to CoPs, such as intrinsic motivation (Schmidt & Moust, 2000) and skill development (Dochy, Segers, Van den Bossche, & Gijbels, 2003).

4.7.7 Applied value

This represents changes in practice and leveraging the capital that was created through the CoP. For example, the knowledge gained by CoP members can be applied within the CoP, so that the practice of the CoP changes, but it can also be applied in other settings with other partners. Applied value comes from the application of the above listed types of value. Examples include performing new skills, designing workshops differently, participating in collaborative research or leveraging the CoP’s collective voice. There are many contributing factors to whether practice in a CoP will change; for example, changing job behaviour may be prevented if the organizational climate is discouraging (Kirkpatrick, 1994).

4.7.8 Realized value

Realized value can be thought of as the results of the CoP and, in particular, of applied value or behaviour change. While many of the types of value can be thought of as mechanisms or intermediate outcomes, realized value represents value that is more traditionally considered as outcome. The work of CoPs external to organizations often aims to influence external practices, be that changing policy, changing science or scholarship, or in the long-term, improving the health and well-being of communities. The outcomes will be highly dependent on the goals,
domain, and practices of a CoP. Examples of realized value include performance improvement, or system change at the external stakeholder level.

Evaluators and CoP members might usefully customize the evaluation framework by separating this value into medium- and long-term outcomes. Medium-term outcomes would be those that could be expected within the lifecycle of the CoP, (e.g., 1-5 years); while long-term outcomes would be those that would be expected to occur beyond the lifecycle (e.g., 5-20 years). Note that as one moves from short- to long-term outcomes, there are more factors, aside from the CoP itself, that contribute to achieving outcomes. How the CoP and evaluator determine short- versus long-term outcomes will take into account the CoP’s stage of development.

4.7.9 Reframing value

Reframing value “is achieved when social learning causes a reconsideration of the learning imperatives and the criteria by which success is defined” (Wenger et al., 2011, p. 21). Like other types of value, this can happen at multiple levels. Achieving reframing value may mean breaking with existing structures and creating a new definition of success (Wenger et al., 2011). Reframing value is related to both the concepts of “double-loop” (Argyris & Schon, 1974) and “triple-loop” learning (Tosey, Visser, & Saunders, 2011); learning to learn is a contributor to transformation. Examples include new definitions of success at the individual or collective level or a change in relationship with external stakeholders. Reframing value can stem from strategic value and reflection as well as accepting and incorporating new practice.

4.8 Applications of the proposed evaluation framework

The proposed framework can be a tool to support different stages of evaluation and multiple approaches to evaluation of extra-organizational CoPs. The proposed evaluation framework can be helpful in both the planning and implementation phase of an evaluation. Additionally, the proposed framework provides a heuristic device to understand the multifaceted nature of evaluating extra-organizational CoPs.

In the planning phase, a number of decisions related to identifying priorities must be made prior to implementing the evaluation. This proposed evaluation framework can facilitate the organization of ideas and the understanding of evaluation constructs, including providing clarity on how terms are used; it can support the development of CoP evaluation priorities by outlining
possible areas of focus. Furthermore, it can facilitate communication between CoP members, funders and evaluators with respect to these priorities—this in turn can support a participatory approach to the evaluation.

While the evaluation framework has multiple levels and types of value, the intention is not to imply that all aspects of the evaluation framework should be covered in all evaluations. Often, a narrow program evaluation is appropriate given evaluation aims and questions; or necessary due to the resources available or allocated. In these cases, the evaluation framework can help in understanding the possible areas of focus and in facilitating discussion regarding priorities amongst those involved in the evaluation. By using the framework, a decision to focus on the individual level for a given reason (e.g., relevance, feasibility) can be taken deliberately, rather than by default, or because the various levels of analysis and types of value have been conflated (Henry & Mark, 2003). The evaluation framework can support evaluators and evaluation participants in articulating and understanding the multiple levels of analysis and types of value and can be deliberate and strategic in choosing what to evaluate – thereby achieving a better, more efficient, and potentially more utilization-focused evaluation.

Having an evaluation framework that offers a more comprehensive structure to understand various types of value could facilitate communication between participants and among participants and evaluators. Participatory approaches to evaluation can include multiple stakeholders and address diverse needs. The proposed evaluation framework might assist with consensus building about priorities, including the prioritizing of the types of value themselves, by offering a way to classify and talk about them. The evaluation framework could also be used to facilitate communication with respect to evaluative topics within CoPs, or between evaluators and CoP members. By facilitating this communication, the framework can foster stronger participatory approaches to evaluation and build evaluation capacity in CoP members. Involving participants (CoP members) in the evaluation and production of knowledge has been shown to lead to better results and to support decision making and learning (Chouinard, 2013; Patton, 1997). We expand on the connection between participatory approaches to evaluation and CoPs in the discussion.

This evaluation framework could also be a useful guide for the implementation phase of an evaluation. Typically, implementation has three general steps: data collection, analysis and
synthesis, and reporting. The framework can be used to assess the value fostered by CoPs, but it can also be augmented to understand both the connections between the different forms of value and how CoP activities relate to different types of value. A CoP’s goals and evaluation questions, and the funder’s evaluation questions, if applicable, will inform how the framework is used and what types of data and analysis are best used to answer the evaluation questions. The use of quantitative indicators can show the different types of value created and for whom. More micro-level tools can be used for data collection and analysis, provided they address the evaluation questions of CoP members or funders. For example, Nistor et al. (2015) provide a questionnaire that addresses elements of individual and collective relational value associated with acceptance of knowledge sharing. If evaluators want to use an existing tool to generate data, this framework can help in matching such tools to CoP evaluation questions and areas of focus. For a qualitative approach, an interview guide could be developed that would address the various value generated by the CoP; indeed, multiple interview guides may be needed to explore the different levels of analysis. For an exploration of linkages between the different types of value, generating impact narratives directed by the framework can be useful, similar to the approach proposed by Wenger et al. (2011), and used by others in evaluating CoPs (e.g., McCormack, Ambler, Martin, Waite, & Wilson, 2016) or other evaluands (e.g., Kuruvilla, Mays, & Walt, 2007). The framework could also be used to analyze and synthesize qualitative data if a deductive approach is appropriate or desired.

Moving beyond traditional ways one could apply an evaluation framework, the proposed framework provides a heuristic device to understand the multifaceted nature of CoP evaluation. It can provide clarity on how contexts, mechanisms, and outcomes are defined, and where the focus of these lie within the possible types of value and levels of analysis. For example, using the framework we propose in this article to examine a protocol for a realist evaluation (Ranmuthugala, Cunningham, et al., 2011) helps to understand the authors’ meaning when they use the term, outcome. They define a CoP outcome as a “…change in behaviour or work practice that occurred, influenced by participating in a CoP activity or through accessing resources provided by the CoP. The change may be to a process; …an innovation; …or change in level of customer (patient) satisfaction” (Ranmuthugala, Cunningham, et al., 2011, p. 3). In using the proposed framework to examine what is meant by outcome, we see that the first part of the definition aligns with the applied value, likely at the individual level. In the second part of the
definition, which describes what the changes may be, the examples correspond to *individual applied value*, *individual realized value*, *individual or collective knowledge (practice) value*, and *external stakeholder motivation value*. This example illustrates that a relatively straightforward definition of a CoP’s outcomes represent multiple types of value at different levels of analysis. Deconstructing an outcome definition according to the evaluation framework helps to clarify its multiple meanings.

### 4.9 Discussion

The purpose of this article was to propose an evaluation framework that could address the evaluation needs of extra-organizational CoPs. We have presented an emerging evaluation framework that builds on an existing framework to provide a more comprehensive consideration of potential types of value and levels of analysis. By providing a structure to consider levels of analysis and type of value of extra-organizational CoPs in a dynamic way, this framework offers a starting point for evaluators and CoP members to learn about their CoP. This framework is an advancement in the evaluation of CoPs, whereas prior frameworks omitted a combined consideration of levels of analysis and types of value. It addresses important gaps in other frameworks, mainly in the systematic consideration of possible value of extra-organizational CoPs. The comprehensive typology offered by this evaluation framework aims to limit the conflation of ideas and terms and leads to clearer definitions and improved communication.

Additionally, the breadth of our proposed framework could flexibly accommodate the complexity of CoPs. Challenges of evaluating complex interventions include: the emergent nature of activities and outcomes, multiple scales of impact, long timelines of impact, hard-to-measure/intangible outcomes, and challenges of attribution/contribution (Patton, 2011; Rogers, 2008). CoPs, as complex interventions could benefit from a broader framework that is more likely to capture emergent value, non-linear processes and the co-evolution of a CoP, its members and external context. As McKellar et al. (2014) point out, many of existing frameworks may be too rigid to accommodate the dynamic nature of some CoPs.

Another strength of our proposed framework is its multiple potential applications described above. The framework is comprehensive and can be used to support formative or summative evaluations. As the framework is applied, it can be modified and elaborated to suit the specific needs of a particular CoP. Extra-organizational CoPs can have narrow domains of interest or
broad interdisciplinary domains. The evaluation framework is generalizable in that it can be applied to CoPs with different domains, practices, and characterizations of success. When applying the framework to a particular CoP, we suggest tailoring the framework to its characteristics and needs. Although designed with multiple stakeholders, and processes and outcomes of extra-organizational CoPs in mind, the evaluation framework could be applicable to CoPs, regardless of the organizational setting, looking for a comprehensive evaluation not solely focused on quantifying return on investment.

Above, we highlighted the proposed framework’s ability to support participatory approaches by being a tool to facilitate communication and priority setting in the potential complex undertaking of evaluating CoPs. We feel that participatory approaches are particularly relevant for communities of practice due to their conceptual alignment and the opportunity for evaluators to be facilitators for CoPs. As Abma (2007) discusses, the CoP and evaluation literature often intersect with a focus on participation and processes. With regards to evaluation, Schwandt (2003) distinguished between a conceptual approach and a technical approach, with the former incorporating interactive, social, and dialogic learning, notions closely aligned with early concepts of CoPs (Chouinard, 2013) such as situated learning (Lave & Wenger, 1991). Situated learning theory argues that learning occurs in social situations in which individuals develop knowledge and skills by interacting with others who can provide insights, usually in a context that involves the practical use of knowledge (Lave & Wenger, 1991). Drawing the connection with the conceptual approach, Chouinard highlighted that learning from a participatory perspective was a way “to enhance capacity building and dialogue at the individual, group, or organization level” (Chouinard, 2013, p. 245), also a key benefit of CoPs.

4.9.1 Limitations and challenges

There is a risk that the grid format will imply discreteness between the cells or imply linearity; however, as mentioned above, the processes, mechanisms, intermediate outcomes and outcomes that are represented by the types of value are highly cyclical and interrelated. For example, as members of CoPs work and learn together, they develop a joint or collective history of learning and a shared repertoire that could be in the form of techniques, tools, stories or perspectives; these then can promote further learning within the CoP or, under certain conditions, work as a barrier to the entry of new members and ideas. The framework in itself does not outline the connections between the cells and therefore is unable to answer explanatory questions about how
and why the CoP works in a particular way without additional program theory development. There are complex causal pathways that lead from CoPs’ processes to long-term outcomes. These are not present in the framework; however, the framework is a tool that is useful in understanding the potential steps within causal pathways. The framework does go beyond a simple ‘pipeline logic model’ (i.e., inputs→processes→outputs→outcomes) in that multiple forms of value (e.g., processes and outcomes) and multiple levels of analysis can be considered; however, causal conclusions require a more complete model. The evaluation framework does not address the challenge of attributing a particular change or outcome to the CoP, particularly long-term outcomes for which there are many contributing factors.

The language used within the framework may create a challenge within different fields. In the evaluation field, evaluators speak of underlying processes, outputs, and outcomes (short and long term). Economists often use the language of value, and those in the field of management often equate value with return on investment. This evaluation framework uses the term value, not to align the framework with economic or management evaluation, but to select a more encompassing term. As mentioned above, the term outcomes may also have been appropriate; however, value is considered to be a broader term encompassing different outputs, emergent states, underlying processes, intermediary outcomes, and long-term outcomes. A focus on mechanism, such as that in the framework set out by Mark and Henry (Henry & Mark, 2003; Mark & Henry, 2004), is challenging given the complexity of CoPs and their related multiple and emergent outcomes. Additionally, this term reflects the language of Wenger et al.’s (2011) Value Creation Framework, from which the types of value were adapted. Moreover, using the language of value may help in advocating for support, or help members recognize some of the benefits they gain through participation.

### 4.9.2 Next steps

The proposed evaluation framework is a starting point. Additional work needs to be done to test the framework by applying it to extra-organizational CoPs and documenting the results and the processes involved. Furthermore, work is needed to understand the framework’s application to different types of CoPs (e.g., virtual CoPs, apprenticeship or task-based CoPs) and those of various sizes and in various sectors. For example, Amin and Roberts (2008) suggest that CoPs engaged in professional knowledge are more likely to experience incremental rather than radical innovation. Future work should also consider the application of the proposed framework with
respect to the lifespan of a CoP, as newly formed CoPs may be different from longstanding CoPs in terms of the value that they are expected to generate (J. Lee et al., 2010; Wenger et al., 2002).

By further developing and applying frameworks, we can build our collective knowledge base on CoPs and how best to evaluate them. We hope that the proposed framework and concepts used within it can be clarified over time. Cousins, Whitmore, and Shulha (2013) point to a long trajectory, and the involvement of multiple thought leaders in evaluation to arrive at our current understanding of collaborative inquiry in evaluations. We invite evaluators and CoPs members to apply, critique, refine or expand the emerging framework that we put forth in this paper.

4.9.3 Conclusion

The framework presented in this article addresses a need to understand CoPs in a systematic way and addresses the lack of evaluation frameworks for extra-organizational CoPs. The proposed evaluation framework offers a comprehensive typology that can be applied in both the planning and implementation stage of an evaluation of an extra-organizational CoP. When applying the proposed evaluation framework, evaluators are guided to consider multiple levels of analysis. Additionally, the evaluation framework can foster better communication in planning an evaluation and encourage the participation of CoP members and external stakeholders. Future work is needed to apply and refine our proposed framework.
Chapter 5
Application of an evaluation framework to extra-organizational communities of practice: capturing value of CoPEH-Canada

5 Paper 3

5.1 Abstract

A community of practice (CoP) is a group of people who work together on an ongoing basis and share knowledge and expertise. Although CoPs exist within and outside of organizations, extra-organizational CoPs have received less attention from scholars, evaluators and practitioners. The primary objective of this study was to assess the applicability of an evaluation framework for extra-organizational CoPs. To this end, we conducted qualitative interviews with an extra-organizational community of practice (CoPEH-Canada). Both the member interview guide and the deductive content analysis were guided by the evaluation framework. Our findings show that the evaluation proved to be comprehensive as a tool to understand the value generated and useful in sharing results with members of the field. We highlight the need to clarify concepts and key evaluation challenges.

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Application d'un cadre d'évaluation à des communautés de pratique extra-organisationnelles: témoigner de la valeur de CoPEH-Canada

French Abstract

Les communautés de pratique (CPs) sont des groupes de personnes qui travaillent ensemble de façon continue et qui partagent leurs connaissances et leur expertise. Bien que les CPs existent à la fois à l'intérieur et à l'extérieur des organisations, les CPs extra-organisationnelles ont reçu moins d'attention de la part tant en recherche, en évaluation que dans la pratique. L'objectif principal de cette étude était d'évaluer l'applicabilité d'un cadre d'évaluation pour ce type de CPs. À cette fin, nous avons mené des entretiens qualitatifs avec des membres d'une communauté de pratique extra-organisationnelle— La communauté de pratique canadienne en approches écosystémiques de la santé (CoPEH-Canada). Le cadre d'évaluation a orienté tant le guide d’entretien que l'analyse de contenu déductive. Nos résultats ont montré que le cadre d'évaluation constituait un outil pertinent pour comprendre les valeurs générées par la CP et utile pour le partage des résultats avec les personnes du domaine. Nous soulignons la nécessité de clarifier les concepts et exposons les principaux défis de l'évaluation.
5.2 Introduction

Communities of practice (CoPs) have drawn the interest of scholars and practitioners, as their contributions are increasingly acknowledged by sectors such as health care, education and business. Understood in an instrumental sense, CoPs can be defined as groups of people who work together on an ongoing basis and share knowledge and expertise. There are multiple types of CoPs; different typologies help to clarify relevant distinctions among them. One important way to characterize CoPs is by organizational setting, since organizational context can contribute to the types of support CoPs receive and influence their goals and evaluation priorities. As such, a distinction can be made between intra-organizational, inter-organizational and extra-organizational CoPs (McKellar et al, under review). Here, our emphasis is on extra-organizational CoPs. While CoPs can form without external support, many funders are supporting or attempting to facilitate CoPs as a way of promoting knowledge generation (Amin & Roberts, 2008), stimulating innovation (Wenger et al., 2002), providing practical guidance (Brown & Duguid, 1991), sharing tacit knowledge (Buckley & Du Toit, 2010), socializing new members to a field (Lave & Wenger, 1991) or addressing system change (Kothari et al., 2015). Despite the potential benefits of CoPs, there has been limited focus on the evaluation of their effectiveness and the evaluation frameworks that can be used to guide such an evaluation. In particular, there has been limited focus on the study and evaluation of extra-organizational CoPs.

In addition to an instrumental sense of CoPs (as described above, as a group of people or a tool for enabling collaborative learning), there are a number of concepts embedded in CoP theory. These key theoretical components include situated learning, identity, and legitimate peripheral participation. Situated learning theory argues that learning occurs in social situations in which individuals develop knowledge and skills by interacting with others who can provide insights, usually in a context that involves the practical use of knowledge (Lave & Wenger, 1991). Identity is another key construct in CoP theory; learning within a CoP is about becoming a practitioner, not just learning about practice (Brown & Duguid, 1991, p. 48). This focus on the development of self through participation is one of the distinguishing aspects of CoPs (Barab & Duffy, 2000). Legitimate peripheral participation describes the movement of new participants from ‘novice’ to full participant through learning from, and about, the CoP in its domain or practice (Lave & Wenger, 1991). Even when participants exist on the periphery, they are accepted and ‘legitimate’ members of the CoP (Campbell et al., 2009; Lave & Wenger, 1991);
members with experience may learn from them (Fuller, Hodkinson, Hodkinson, & Unwin, 2005), and the community adapts as new members join (Brown & Duguid, 1991). These theoretical concepts help in understanding CoPs and, when applied to CoPs in the instrumental sense, in distinguishing them from other groups.

Evaluation frameworks can provide a summary of which themes, components, mechanisms, contexts or outcomes to include in an evaluation, and can be helpful by systematizing approaches and facilitating comparative work. Demonstrating the applicability of evaluation frameworks, and refining frameworks through application and reflection, can improve evaluation frameworks. In a review of evaluation frameworks for communities of practice and knowledge networks, McKellar et al. (2014) found that nine of the 19 studies included in the review applied or tested evaluation frameworks in some form, with varied levels of reporting. This review found that what was learned about the CoPs or knowledge networks was more commonly reported than what was learned about the frameworks or the evaluation process. Reporting on the evaluation process itself could help with understanding how the framework and evaluation processes could be applied in other settings.

McKellar et al. (under review) (Chapter 4) developed a new evaluation framework for extra-organizational CoPs. This evaluation framework can be thought of as a taxonomy that outlines the types of value that can be experienced through CoP processes and the multiple levels of analysis (e.g., members, stakeholders) that experience this value. By looking at these two dimensions (type of value and level of analysis) a more systematic evaluation of CoPs is possible. The proposed evaluation framework provides a heuristic that can be applied at multiple points in the life cycle of a CoP, just as evaluations can be conducted at different times in a program’s life cycle. The evaluation framework uses the term ‘value’ as it encompasses processes and outcomes of CoPs and reflects the language of Wenger et al.’s (2011) Value Creation Framework, from which the types of value were adapted. The evaluation framework is represented by the scaffolding of Table 5.1.

The applicability of this evaluation framework has yet to be assessed. The objective of the study reported here was to assess the applicability of the McKellar et al.’s evaluation framework with members of an extra-organizational CoP through a qualitative approach. Specifically, the paper addresses the following questions: How well do the dimensions of the evaluation framework help
to capture the value created by extra-organizational CoPs? After introducing the methods, the paper presents descriptive results, focusing on value generated at the individual and collective levels. We then suggest refinements to the proposed evaluation framework based on this application.

5.3 Methods

While the evaluation framework can be applied in several ways, a qualitative approach offers opportunities to illuminate the value afforded by CoPs, while contributing to an assessment of the evaluation framework’s applicability. Qualitative interviews are well aligned to a conceptual approach to evaluation, which incorporates interactive, social, and dialogic learning (Schwandt, 2003). This more dialogical approach is closely aligned with CoP concepts (Chouinard, 2013) such as situated learning (Lave & Wenger, 1991). This makes a qualitative approach a strong match to study CoPs. By engaging CoP members in the evaluation, through qualitative interviews that ask them about their experiences in the CoP and the value generated by the CoP, CoP members can learn from their reflections, with the potential of promoting strategic learning about the CoP (Patton, 1997). We therefore use a qualitative approach to assessing applicability of the evaluation framework in this first application. The evaluation framework developed by McKellar et al. (under review) informed both qualitative data collection interviews and analysis.

5.3.1 Research Setting

The evaluation framework was applied through a qualitative study of the Canadian Community of Practice in Ecosystem Approaches to Health (CoPEH-Canada), an example of an extra-organizational CoP. As an extra-organizational CoP, CoPEH-Canada “share(s) a basic body of knowledge that creates a common foundation, allowing members to work together effectively” (Wenger et al., 2002, p. 66) and has a “commitment to exploring the domain and to developing and sharing relevant knowledge” (Wenger et al., 2002, p. 43). CoPEH-Canada was selected as the focus because while it has been involved in self-evaluation, there continue to be unanswered evaluation questions (McKellar et al., 2014; Parkes et al., 2012; Spiegel et al., 2011). With CoPEH-Canada being established in 2008, it could be considered a mature CoP. It is therefore likely to have developed a range of value related to the proposed evaluation framework, given that characteristics and activities of CoPs change with stages of maturity (J. Lee et al., 2010). Furthermore, the primary author (KAM) participated in CoPEH-Canada, as did two of the
contributing authors (DCC & JSC), one as founding member (JSC). This provided access to interview participants and contextual understanding of the interview data.

CoPEH-Canada is a network and community of scholars and practitioners from across Canada, established for the development and dissemination of ecohealth ideas and practices. As described by Charron (2012c, p. 7), ecosystem approaches to health (ecohealth) “recognizes that health and well-being are the result of complex and dynamic interactions between determinants, and between people, social and economic conditions, and ecosystems.” CoPEH-Canada aims to advance the field of ecohealth and to address current challenges to a healthy and sustainable global future by supporting collaboration, capacity building, education and knowledge translation. Membership includes practitioners, policy makers, and many academics. CoPEH-Canada is dispersed with a nodal structure; the three nodes are Western, Ontario and Québec-Acadie-Atlantique. As CoPEH-Canada has been supported though grant-based funding, core members of the CoP tend to also be principal investigators, often one per node. These core members are located at nine Canadian universities in five provinces.

Many of the goals of CoPEH-Canada are addressed through training and capacity-building activities. In particular, a collectively designed, intensive field course is offered to graduate students as well as professionals to strengthen the collaborative capacities of both instructors and students (Cole, Parkes, Gislason, & Webb, under review; Parkes et al., 2017). CoPEH-Canada has expanded over the years and includes many of the students who participated in the field course. Additional activities have included evaluative research to examine social networks, collaborative relationships, capacity building, and outcomes for the community of practice and the field of ecohealth; and core team meetings to coordinate and provide strategic direction for the community of practice, including sustainability planning. In addition to activities within the community, CoPEH-Canada has partnered with the Latin American Community of Practice (CoPEH-LAC), to form EkoSanté. This initiative aimed to learn from past ecohealth experience while supporting emerging scholars and nodal activities (Brisbois et al., 2017; Saint-Charles, Webb, & Barraza, 2017).

5.3.2 Data Collection

The sampling strategy for interview participants was purposive (Teddlie & Yu, 2007), aiming to obtain views from a variety of members with different characteristics. Both early-,
career participants within CoPEH-Canada were selected from different geographic regions, with varying lengths of time participating in the community, and surmised core and peripheral status. The sampling frame comprised of registered members of COPEH-Canada who participated in at least one of the annual CoPEH-Canada field schools, as either student participants or part of the teaching team. There are approximately 191 members who have participated in the CoPEH-Canada field school from 2008 to 2014. Table 5.1 provides an overview of interviewee characteristics. Early-career members included students, post-doctoral fellows or early-career professionals at the time of their participation, some of whom had advanced in their careers by the time of the interview (given that some were student participants as early as 2008). Later-career members had more established academic careers at the time of participation. It was anticipated that approximately 12-20 interviews would be required to achieve coverage of relevant areas. The number of interviews conducted (15) was ultimately determined based on code saturation (Hennink, Kaiser, & Marconi, 2017) at the individual and collective levels.

Fifteen semi-structured interviews were conducted, face-to-face when feasible (3), or Skype or telephone when face-to-face was not feasible (12). Interviews were primarily conducted in English, with native French speakers (3) encouraged to switch to French at any point during the interview if they felt more comfortable or were better able to express themselves. Passive bilingualism, where people respond in their preferred language, is common in CoPEH-Canada. Interview recordings ranged from 20 to 77 minutes with an average length of 48 minutes. Questions were devised based on the evaluation framework and included broad questions that cut across the framework. The interviews started by asking the member about their professional background and participation in CoPEH-Canada, and then moved to questions based on the levels of analysis (individual, collective, etc.), using probes for different types of value. Interviewees were also asked developmental evaluation questions related to suggested changes in CoPEH-Canada. The interview guide is available in Appendix F. Each participant was interviewed once. Participants were available for a subsequent clarifying conversation, however none were necessary. Alphanumeric codes were assigned to each interviewee; the illustrative quotes use these codes to distinguish between speakers.
Table 5.1 Interviewee characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Interviews</td>
<td>15</td>
</tr>
<tr>
<td><strong>Node</strong></td>
<td></td>
</tr>
<tr>
<td>West</td>
<td>5</td>
</tr>
<tr>
<td>Ontario</td>
<td>6</td>
</tr>
<tr>
<td>Québec-Acadie-Atlantique</td>
<td>4</td>
</tr>
<tr>
<td><strong>Career stage</strong></td>
<td></td>
</tr>
<tr>
<td>Early</td>
<td>9</td>
</tr>
<tr>
<td>Late</td>
<td>6</td>
</tr>
<tr>
<td><strong>Year of first participation</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;2011</td>
<td>10</td>
</tr>
<tr>
<td>&gt;2011</td>
<td>5</td>
</tr>
<tr>
<td><strong>Core/Periphery</strong></td>
<td></td>
</tr>
<tr>
<td>Core</td>
<td>6</td>
</tr>
<tr>
<td>Periphery</td>
<td>11</td>
</tr>
</tbody>
</table>

5.3.3 Data Analysis

Interviews were audio-recorded and transcribed verbatim. All interview transcripts were verified prior to coding to ensure accuracy. Coding was conducted deductively using NVivo (QSR International), supported by Excel for deductive framework coding. Deductive coding was guided by predetermined codes linked to the evaluation framework (McKellar et al, under review). After deductive coding was conducted inductive coding was conducted to describe the codes within each level of analysis. Data was coded in its original language, and select French quotes were translated to English for reporting. A coding scheme and codebook was developed to align with each level of analysis and type of value in the evaluation framework. Elements of framework analysis were used (Pope, Ziebland, & Mays, 2000; Ritchie, Spencer, & O’Connor, 2003), specifically charting for structured theme-based deductive analysis. This allowed the exploration of each type of value and level of analysis as well as any overlap, and therefore exploration of each cell of the evaluation framework. A directed approach to content analysis with deductive coding was useful to validate or extend the evaluation framework (Hsieh & Shannon, 2005).
A lead team member carried out the deductive and inductive coding, followed by co-coding and discussion with second reviewers from the team. Discussion promoted consistency in coding (Baxter & Jack, 2008). Notes and discussion of the processes focused on the challenges of coding according to the evaluation framework and possible modifications. Discussions also included being explicit about potential ‘biases’ in light of positionality.

5.4 Findings

This section provides an overview of the value generated by CoPEH-Canada, informed by the deductive analysis. The description below generally moves from left to right in the evaluation framework (which is the scaffolding of Table 5.1). The description focuses on value at the individual and collective levels followed by a summary of value at the other levels of analysis. As we move to the right of the evaluation framework, the types of value are more long-term and distal. Towards the left of the evaluation framework, generating these types of value is not in CoPEH-Canada’s sphere of direct control or influence (Montague & Porteous, 2013); this translates to fewer examples within the data to draw upon. The quotes in the text below represent exemplary data aligned to the various types of value.

Table 5.2 provides a view of how the evaluation framework can be used to categorize data. It also offers short quotes as examples from the interview data, which illustrate the different types of value and levels of analysis. The data within the table are generally different that those embedded in the description below; however, if particularly exemplary, the quotes in Table 5.2 are called out in the text. In creating Table 5.2, there were many examples to draw from for motivation and participation, relational value, knowledge and cognitive value, and learning value. Some of the quotes provided represent statements about a particular value not being achieved, particularly for realized value.
<table>
<thead>
<tr>
<th>Level of Analysis</th>
<th>Type of Value</th>
<th>Motivation and Participation</th>
<th>Relational</th>
<th>Knowledge and cognitive</th>
<th>Tangible</th>
<th>Intangible Value</th>
<th>Learning</th>
<th>Applied</th>
<th>Realized</th>
<th>Reframing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td></td>
<td>When I think back to my intention for taking the course, again I think it was just a reflection of my own frustration with the way that public health traditionally thinks about really big environmental challenges. –O43</td>
<td>... The friendships that I made, the people that I met, I enjoyed... It wasn’t just that I enjoyed learning with these people. –F30</td>
<td>I would say every activity in CoPEH-Canada represented in some aspect an opportunity to further my knowledge of the different pillars, let’s say, of ecohealth –G34</td>
<td>Having essentially gotten or have the opportunity to get postdoc funding as a result of the relations and work that I had done. –C21</td>
<td>I think it feels good to know that we’re part of something that is bigger than us, than our own research interest. –G34</td>
<td>And so I think it’s that combination of practicality and hope that I would say is my primary learning. –H17</td>
<td>Well, I think it has changed what I do. I mean I’ve brought new methods into my project proposals. –I27</td>
<td>I took a postdoc position... an opportunity that would not have been afforded to me had I not been connected up through the CoPEH-Canada network. –O43</td>
<td>It was like the entire way that I thought about it and approached research and everything changed. –D22</td>
</tr>
<tr>
<td>Collective</td>
<td></td>
<td>What’s animated us collectively is the recognition that the contributions that the academy needs to give to [destruction of our sustaining ecosystems] have been severely lacking. –H17</td>
<td>Even though it could be considered relatively young, it seems like there has been a lot of work and a lot of relationship building done in that time. –A10</td>
<td>And so I think CoPEH-, specifically the classes that we took... allowed us to become critical of that process even within our own research project. –F30</td>
<td>I see more value in that [relationships and process of learning from each other] than in the products of the projects. –B41</td>
<td>Simply being a recognized collective has provided the capacity for a voice that maybe individuals wouldn’t have been able to have. –M19</td>
<td>You know, the practical learning of how to do a community of practice, I think that that will have a lasting effect, most definitely. –F30</td>
<td>I think the summer school was innovative in training and how the teaching is done within this course. I think too, with the teaching manual for example. –G34</td>
<td>But I think that we’ve matured enough to start doing more research as a group. –J36</td>
<td>Whereas I feel now there may be more acceptance to the idea that there’s a range of different goals that intersect in different ways. –C21</td>
</tr>
<tr>
<td>Organization</td>
<td></td>
<td>And so, you know, back before CoPEH-Canada, we didn’t have ecohealth clubs on campus. We had [Name], you know, and his researchers maybe... But now it’s bigger. –L26</td>
<td>I think we reached a matrix of connections across not only the initial three institutions but the other institutions that have followed suite on it. –H17</td>
<td>I draw from ... some of the literature and some of my experiences when people [I work with] are trying to...question the legitimacy of transdisciplinarity. –N24</td>
<td>The teaching manual was a great opportunity. I also really liked that that was sort of open source. –F30</td>
<td>It [CoPEH-Canada] gave us [a university research centre] a lot of recognition, visibility and credibility. –K38</td>
<td>Probably at the policy and organizational learnings... my sense is that relies more on the strength of individuals rather than the collective. –M19</td>
<td>If we can show that this is so valuable that we need a faculty member with this in their title...that’s huge. And I don’t know that that would have ever happened without CoPEH-Canada. –L26</td>
<td>I think that our, if you will, retrograde influence on institutions, certainly on mine, was minimal. –H17</td>
<td>I think that the other side of equation or the creation of the receptor site for such folks [a new kind of intellectual practitioner] is lagging a bit. –H17</td>
</tr>
</tbody>
</table>

Table 5.2 Evaluation framework populated with example quotes from interviews
At the same time, I look at the work that we do with different communities. The work that we've been doing with the climate change adaptation, we have people that are just very happy to be working in this kind of transdisciplinary work. ~J36

I see a little bit of that kind of partnering with wider groups of people around/across overlapping themes part of the opening up ~C21

That was an opportunity where you had a CoP directly influencing the possible revision or at least revisiting of what core public health competencies ought to look like, and try to inject some kind of new thinking in there. ~O43

We did a presentation to deputies, elected deputies ... And it really resonated a lot with the people ~J36

The work that we've been doing [with communities]... we have people that are just very happy to be working in this kind of transdisciplinary work. ~J36

Our approach to learning ...is...useful to others... They see the importance of developing those working relationships... It's teaching by doing. ~J36

So now what they [community members trained as part of a research project] are doing is they're testing the water ~L26

They are not getting sick like they were because ...the power to make the decision about when to drink the water is in the hands of the community now instead of the hands of others. ~L26

...The relationship with [Health Region] and the ...fairly direct influence ... on the development of... a rethinking of what the health system is all about. ~H17

1: EkoSanté is a collaboration arising from Communities of Practice in Ecosystem Approaches to Health (CoPEH) in Latin America and the Caribbean (CoPEH-LAC) and CoPEH-Canada. EkoSanté was formalised in 2013 after receiving financial support from the International Development Research Center of Canada (IDRC).
5.4.1 Motivation and Participation Value

Motivation to participate in CoPEH-Canada included frustration with context or structures external to COPEH-Canada, where CoPEH-Canada, or ecohealth approaches generally, provided a way to work towards addressing issues. As one member explained, “[I] got just really frustrated with that lack of holistic thinking, and so needed something else to fill that void. And thought that ecohealth occupied a really nice space” (O43). Members also discussed their perceived personal pay-off: “I saw it as just truly beneficial so I wanted to continue going” (F30). At the collective level, analysis demonstrated externally motivating forces such as frustration (example quote in Table 5.2), competition within academia, and positive support from the International Development Research Centre. As with the individual level, there was a sense of pay-off from participation. This is shown in this quote: “We’re not just doing it because we’re altruist. It gives us something in the way that…it supports us in the way that we want to do research” (J36).

5.4.2 Relational Value

Individual and collective level relational value was a key value produced by CoPEH-Canada. Relational value was frequently discussed in the interviews and was described as satisfying and important by several members. Members talked about specific relationships, for example naming members that were friends or mentors, but also the network of connections more broadly. The relationships were seen as a form of collegial and intellectual support. As one respondent described, “So it made sense that that was something that I could draw from. For peer support, I guess, also in terms of how to conduct large-scale participatory and engaged research projects; but then also some of the intellectual background” (N24). Examples of collective relational value included mention of international connections, bridges with other CoPEHs, particularly CoPEH-LAC (Latin America and Caribbean), as well as facilitating inter-sectoral links (e.g., business and non-profit sectors).

5.4.3 Knowledge and Cognitive Value and Learning Value

Knowledge and cognitive value, and learning value, were also important to study participants in CoPEH-Canada. Respondents made connections between relationships in CoPEH-Canada and the learning that resulted. These connections illustrate key concepts of CoP theory such as social
and situated learning. The following quotes provide examples: “And I guess being able to see what different people in different places are thinking and situate my own practice and theorizing in relation to that” (C21); “You’ve got some exposure to people who allow you to play with some different ideas that you might not in your day-to-day work” (M19). CoPEH-Canada provides structure for individuals to exchange ideas and opportunities for social learning. One member’s quote highlights psychological safety which is described as being important for knowledge sharing (Y. Zhang, Fang, Wei, & Chen, 2010), learning (Johnson, 2001) and CoP sustainability (McCormack et al., 2017). This quote was in response to a question about the most satisfying part of participating in CoPEH-Canada: “…the ability to be able to think outside of the box and to be comfortable” (J36).

Members described learning about how to work together and being introduced to ideas (learning value) as well as techniques, new literatures, concepts or approaches (knowledge and cognitive value). For collective knowledge and cognitive value, respondents provided examples of generating knowledge or innovations. Interviews also exposed an element of social learning; “If we’re talking about process and teaching an approach, I feel that’s something that’s really hard to learn on a computer… there’s something about an exchange of energy between people that allows us to actually grasp a process” (F30). Data also related to learning to work together as community of practice, for example, becoming better at community building. Collective learning value was commonly highlighted with respect to sustainability, and having a lasting impact (example in Table 5.2). Joint learning and learning to work together were identified as being important, as well as creating space for this learning, as an example “But I just see it [value] more along the lines of where spaces for conversation and learning and reflection have been able to happen” (C21).

5.4.4 Intangible Value

Intangible value at the individual level included increased confidence and a sense of validation. Some of the intangible value could be connected to collective relational value: “so having communities of practice around you such as ecohealth is very refreshing and rewarding personally, and validating for the way that I approach things. So it’s almost like a weight lifted off my shoulders, like I am not alone.” (E12). Modeling was a sub-theme that could be considered an intangible value, and one that promotes learning and becoming part of the CoP (Handley et al., 2006). This quote shows modeling and influence on career trajectory, “Knowing
that there were other people who made a career of it was really important to me too” (D22). In
addition, members discussed the emotional aspects of the CoP and the support that they received:
“And maybe that’s the main thing that CoPEH-Canada has done … I mean I don't know, is that
an immunization against despair or is it a distraction from despair or is it something more
practical?” (H17). Also on the collective level, there was a focus on the reputation and voice of
CoPEH-Canada; one member provided the example of CoPEH-Canada being asked to participate
in grant applications as an indicator of reputation.

5.4.5 Tangible Value

While examples of tangible value were provided, some members suggested that this was not as
important as other types of value. “So it wasn’t like one specific event or one tangible outcome.
It was more about, I guess, the learning process for me” (D22). That said, a number of early-
career members listed tangible benefits such as bursaries or co-authored publications as benefits
they experienced through their participation in CoPEH-Canada, as well as access to collectively
produced tangible value. The teaching manual (McCullagh et al., 2012), and publications were
commonly mentioned; these are an example of collective tangible value. Other outputs, although
not necessarily ‘tangible’, seemed to fit best here (see discussion and Appendix G for more
detail). For example, one member suggested: “I think [what] is important that we did with
CoPEH-Canada is the organization of the Ecohealth 2014 [conference]. That wouldn’t have been
possible if we hadn’t built the relationships and the curricula that we had with the courses. So
being able to do those kinds of activities” (J36).

5.4.6 Applied Value and Realized Value

There were a number of examples of changes in practice (applied value), most notably changes
in approaches to how research was conducted, or the adoption of ecohealth approaches to
research. For realized value, members reported changes in career-related performance. At the
collective level, there were realized value examples of engaging in interdisciplinary processes,
doing things differently (e.g., new approaches to organizing workshops), and doing research
together. The following quote highlights the process of moving from learning to a new collective
action, “and by working together, I think that we learned a lot about the different components
that are common to these different ways of using ecosystem approaches to health. And by doing
that, it helps us go further in the way that we’ve been doing the system approaches to health. And
it allows us to start doing research together” (J36). Members also questioned the extent to which this value was achieved; for example, one member questioned: “So I often wonder how symbolic and sort of just like checking it off a list it was, rather than actually bringing concrete changes in terms of how we’re interacting with and listening to the stakeholders, and exchanging with them and learning with them” (F30).

5.4.7 Reframing value

Reframing value represents a reconsideration of learning imperatives or a redefinition of success (Wenger et al., 2011). Wenger et al. (2011) also highlight that this value can be about a transformation or leaving behind existing structures; this was expressed by several members. In response to a question about possible benefits, one respondent said, “I guess my broadest answer is I feel like it’s made me who I am. You know, it’s kind of as big as that” (N24). This quote illustrates a sense of becoming through participation, a personal transformation, although the respondent does not speak of a new definition of success. At the collective level, one member said, “we’ve matured enough to start doing more research as a group” (J36) resulting, in part from shared viewpoints of ecohealth. The example quoted in Table 5.2 (collective, reframing value) shows a reframing not just of what CoPEH-Canada’s goals are, but also transformation in being open about what these goals are. Members also highlighted a greater need for confronting structural issues of the CoP’s actions and its institutional context.

5.4.8 Organization, Field, and External Stakeholder Level of Analysis

Extra-organizational respondents found value for members’ organizations included non-CoPEH Canada individuals (e.g., other employees) being introduced to ecohealth approaches, seeking out partnerships with CoPEH-Canada members and applying ecohealth approaches to their work. Respondents provided examples of introducing ecohealth and collaborative approaches or sharing with colleagues what was learned through their experiences with CoPEH-Canada (e.g., the importance of transdisciplinarity). There were examples of CoPEH members developing courses at different universities and using innovative teaching and workshop approaches. Respondents provided examples of relational value, knowledge and cognitive value, and applied value for external stakeholders, such as regional health authorities that worked with CoPEH-Canada. Communities that were target populations of members’ ecohealth research provided examples of knowledge and cognitive value, applied value, and realized value of improved
health. Regarding the field level, in this case ecohealth, respondents offered examples of contributing to the International Association of Ecology and Health, of pushing the boundaries or ideas of the field and contributing to the cohesion and legitimacy of ecohealth. Much of the value for the field overlapped with value in other levels of analysis; for example, ecohealth having a stronger presence (faculty, student clubs) at universities, and health regions and non-governmental organizations (NGOs) incorporating ecohealth concepts.

5.5 Evaluation Framework Refinements

We came across a number of challenges regarding the evaluation framework’s application that allowed us to identify aspects of the framework that could be clarified, expanded, and reorganized. These are reported here and in a revised template of the evaluation framework and accompanying definitions provided in Appendix G.

5.5.1 Activities and Outputs

Activities of and events organized by the CoP did not have an obvious place within the framework. In the Value Creation Framework (Wenger et al. 2011), these would be considered immediate value; however, that categorization is considered problematic because the events can be the results of collaborative efforts and not just a source of satisfaction or of building connections. Although activities and events do not fit with the original definition of tangible value, they are best aligned here as a type of output of CoPs. An example of this is CoPEH-Canada’s role in organizing and hosting EcoHealth 2014, the conference of the International Association in Ecology and Health in Montreal. This was an expression of collective activity that is unlikely to have been possible without strong working relationships within CoPEH-Canada.

5.5.2 Identity

Identity was a significant theme in the data; however, it was not immediately obvious how it fit within the evaluation framework. Identity is a central concept in understanding CoPs. It relates to ongoing participation and negotiation of meaning, which are considered central to learning and knowledge generation (Lave and Wenger, 1991). Due to its conceptual overlap with learning, we propose to incorporate it into learning value with a name change to reflect the importance of identity in CoPs (see updated definition below). Intangible value such as feelings of validation and confidence have an influence on identity and are therefore a part of learning. Although
identity construction would be intangible, it is better aligned with learning in CoPs. For example, as noted below, where a CoP member talks about identity, but does not explicitly mention learning.

You know, part of it is just you grow and you change throughout your career. So that’s normal. But it’s [CoPEH-Canada has] influenced where and how I changed. I would have used to primarily thought of myself as a [practitioner of a discipline] when I first graduated with my PhD. But I don’t now. I more closely associate with the ecohealth community. –127

This member also talked about becoming aware of their own strengths and weaknesses and learning when to collaborate with others. Both would be categorized under learning and identity. Another response also appears to demonstrate the link between learning and identity when the respondent commented that; “It’s also partially shifting our way of thinking in a certain sense about how we are in the world…and so what it’s allowed me to do is bridge those two things together and realize that there’s not really a distinction” (F30).

5.5.3 Knowledge versus Learning

A significant challenge in applying the evaluation framework through deductive coding was the distinction between knowledge and cognitive value, and learning value. The original distinction was created to address the importance of these types of value to CoPs and to create a distinction between processes and outcomes of learning. Learning processes can be individual or social, and social learning processes can have effects for both the individual and collective levels (Reed et al., 2010). The distinction of process and outcomes is both familiar and useful for evaluators; however, the distinction is confusing and counter to CoP and situated learning theories. Situated learning theory proposes an alternative to cognitivist theory where knowledge is not just acquired. Situated learning emphasizes the social-cultural dynamic through considerations of participation, identity construction and practice (Handley et al., 2006). Despite the strong overlap of process and outcomes, we propose they remain as two distinct types of value within the framework, but with a renaming and clarification of the definition. Knowledge value refers to knowledge and skill (both explicit and tacit knowledge) regarding the domain and practice, while learning and identity value refers to learning how to learn and work collaboratively, and is process-oriented (including reflective processes). It also includes changes in identity through negotiated meaning with the CoP.
5.5.4 Reframing value

Similarly, there was not a well-defined boundary between learning value and reframing value. As learning is a constant process of negotiating within CoPs, the threshold at which something is considered a reframing is not clear. To help distinguish this, we look at the similarities between social learning and loop-learning theory. Reframing has been associated with double-loop learning, which refers to “revisiting assumption (e.g., about cause–effect relationships) within a value-normative framework” (Pahl-Wostl, 2009, p. 359); while transforming has been associated with triple-loop learning (Pahl-Wostl, 2009), which refers to reconsidering underlying values, beliefs, and world views. Triple-loop learning has been conceived as a form of organizational learning (Tosey et al., 2011). The revisiting of assumptions, within a value-normative framework, and a reconsideration of underlying values, beliefs and worldviews (triple-loop learning) are important to capture, so are the changes that have resulted from these learnings. Therefore, we propose renaming and expanding the value to reframing and transformative value, defined as the reconsideration of learning imperatives as a result of learning itself, a redefinition of success, or a fundamental change. This alteration also better aligns with Wenger-Trayner’s (2014) advancement of the Value Creation Framework. Value related to reflective practices would be captured in both learning and identity value and reframing and transformative value. This overlap aligns with Argyris’ (2003) view of triple-loop learning as reflexivity about the process of learning, that is, learning about how we learn (Tosey et al., 2011). Critical self-reflection promotes learning, and examination of the processes that move CoPs towards reframing and transformational value is essential for recognizing and creating change.

In addition to the proposed changes above we propose re-ordering the columns in the framework. This will allow for types of value that share similarity (e.g., knowledge and learning and identity) to be closer together for ease of review and to better view comparators (see Appendix G).

5.6 Concluding Discussion

This study demonstrates that the McKellar et al. (under review) evaluation framework can capture the value generated by extra-organizational CoPs, that is to say, that the types of value in the evaluation framework sufficiently match the value expressed by interviewees. The evaluation framework was used to develop the interview guide, with sections of the guide devoted to each level, and with probing questions relating to some of the types value, (while also leaving room
for more open and developmental questions). The evaluation framework was also used to structure the deductive analysis, coding text as it applied to a level of analysis, a type of value or both; and report and display data. Through these applications, the evaluation framework proved to be a comprehensive tool used to understand the value generated and also to share results with members of the field. Reflecting on the approach provided the opportunity for sharing lessons learned regarding the application of the evaluation framework and for making refinements to it. The use of the evaluation framework and interview guide could be a useful combination in learning about value generated by CoPs.

A strength of this research was acknowledging and sampling the different roles within CoPs. Traditionally roles have focused on “newcomer” (novice) and “old-timer” (expert), and the progression from newcomer to old-timer or full participant (Lave & Wenger, 1991). This distinction between an inexperienced person versus a person with different experiences is an important one and often overlooked in the CoP literature. This dichotomous view stems from Lave and Wenger’s (1991) CoP theory development with apprenticeship. The focus on only novice/expert is not helpful when people who have different forms of expertise join the CoP (Fuller et al., 2005). This is particularly relevant for CoPEH-Canada and other transdisciplinary CoPs. Speaking with a variety of members provided opportunities for greater breadth in examples of value, and provided a source of triangulation for learnings about CoPEH-Canada. Additional strengths included the data collection strategies that allowed for flexibility in the interviews and included developmental evaluation questions. This provided insight with respect to the types of value in the framework, and also the potential for learning about CoPEH-Canada and how CoPs could extend the value created.

There are limitations to this application of the evaluation framework. Although the interviews provided rich insights about the value produced, the number and variety of interviewees was limited. By interviewing additional members, or including non-members (e.g., representatives from organizations, people that participate in the field of ecohealth but are not CoPEH-Canada members), we would have a better sense of whether the evaluation framework captured value at the organization, field and external stakeholder levels. Furthermore, additional sources of data could extend the validation of the framework. For example, document review could contribute to examples of policy change or challenges in achieving policy change (Brisbois et al., 2017) (policy change would be captured under applied value at the external stakeholder level in the
evaluation framework). With 15 interviews, we can expect that we achieved “code saturation”, that is, that the range of thematic issues was identified. However, it is possible we did not reach “meaning saturation”, that is, providing a “richly textured understanding of issues” (Hennink et al., 2017). A larger sample, though not necessary to answer the research questions, could contribute to greater insights into CoPs.

As a possible limitation, interviewees had a tendency to express or share positive aspects of their participation. Using the framing of value rather than, for example, process and outcomes likely influenced what we assumed to be a bias towards a positive framing. This was mitigated by prolonged engagement, and attention to scripts. Despite these efforts, the tensions within the CoPs and areas for improvement within CoPEH-Canada are underrepresented. Further, as we only examined a single case example, it was not possible to fully identify the sources of discrepancy between the data and the framework. For example, if a value was not well demonstrated, it might point to improvements needed in the interview guide or evaluation approach, rather than a demonstration that this value was not generated by CoPEH-Canada or that a particular aspect should be removed from the evaluation framework. The choice of case, CoPEH-Canada and its context, has implications about what we learned.

The data, although broad, was rich. With this same data set or an extension of it, other evaluation and research questions could be addressed. In particular, the data can be used to explore the possible mechanisms related to the value generated, particularly at the individual and collective levels. Mechanisms are not explicitly a part of the evaluation framework but are ways of generating (or hindering) value. Mechanisms can also be thought of as things that connect two or more types of value across levels of analysis. Additionally, mechanisms might be a starting point to examine the relationship between CoPEH-Canada and the field of ecohealth and similarly, CoPs and their field(s). A potential point of interest is an exploration of CoPs in academia and the influence on students’ participation in academia. A next step, therefore, might be to push the boundaries of this study by doing more social-theoretical explorations, such as the contribution of academic CoPs to academia.

Further validation work should entail the application of the evaluation framework to multiple extra-organizational CoPs. In this study, we used a qualitative approach; future validation work should consider different approaches (see McKellar et al., under review), including mixed
methods or quantitative approaches. Additional applications could incorporate the CoP’s objectives. Reflection on and analysis of uses of the framework could also address questions such as ‘What are the best techniques for understanding and measuring each level value?’

In applying this framework through qualitative interviews, the authors believe that useful insights were revealed regarding the value produced by CoPs, and CoPEH-Canada, in particular. In reporting on the application of the evaluation frameworks we can confirm their utility and build the body of evidence to support evaluation strategies incorporating the framework. Examples of application improve their usefulness by demonstrating to evaluators how they can be applied and adapted. Applying the framework in this study highlighted the need to clarify concepts and expand the definition of some types of value. These changes will help guide evaluators and CoP members to better evaluations. Thus, evaluators, researchers and CoP members can use the evaluation framework to learn about (their) CoPs as a way of contributing to their success (Probst & Borzillo, 2008).
Chapter 6
Discussion

6

6.1 Overview

Communities of Practice (CoPs) are groups of people who interact on an ongoing basis to share knowledge and expertise about common practices, problems, or topics to advance collective learning (Wenger et al., 2002). Despite the growing interest in and implementation of CoPs, they have been subjected to only limited evaluation (Bertone et al., 2013; Li et al., 2009b) with even less agreement on approaches to evaluating their influence (Li et al., 2009b). In particular, there has been limited study or evaluation of extra-organizational CoPs. Greater evaluation of communities of practice could be an important step towards, understanding how they work, suggesting how they could be more effective, and explaining how they might be sustained (Wenger et al., 2002).

This dissertation begins with an overview of CoPs, defining them in their instrumental sense (i.e., CoPs as a group of people) and outlining the key concepts of CoP theory. In reviewing the literature, it was clear that CoPs both within and outside of organizations are seen to have a number of benefits, in particular promoting learning, knowledge translation, knowledge generation, and breaking down professional barriers. These perceived benefits notwithstanding, no systematic tool is in use to support the evaluation of extra-organizational CoPs.

This dissertation focuses on the evaluation of CoPs generally, with specific interest in informing evaluation approaches for extra-organizational CoPs. The broad aims of the research were to understand how CoPs are being evaluated, to develop and apply a framework for evaluating a CoP and, in the process, to contribute to understanding of extra-organizational CoPs. This was achieved through a series of sequential studies that provide insight into how CoPs are currently being evaluated, and how this could be improved.

In summary, I began by conducting a systematic scoping review of existing evaluation frameworks for communities of practice and knowledge networks.
• Paper 1: Evaluating communities of practice and knowledge networks: A systematic scoping review of evaluation frameworks

After determining that such frameworks were not adequate to address the evaluation of extra-organizational CoPs, I proposed an alternative framework. The proposed evaluation framework, expanded existing work to allow for systematic consideration of the multi-level nature of the value of CoPs.

• Paper 2: A framework for evaluating extra-organizational communities of practice

This framework was then applied to a case example as a way of assessing the appropriateness of the framework, while also learning about an extra-organizational CoP through the case example.

• Paper 3: Application of an evaluation framework to extra-organizational communities of practice: capturing value of CoPEH-Canada

This concluding chapter builds on the discussions within Chapters 3-5. The key findings from each of the three studies are revisited and I provide a synthetic discussion and schematic relating the three papers. The discussion then moves to lessons learned in applying the framework. I summarize both the implications and contributions of this dissertation before providing an overview of its limitations. I follow with suggested areas for future research and concluding statements.

6.2 Summary and Integration

6.2.1 Paper 1 summary

To understand how CoPs should be evaluated, the starting point (Paper 1) was a systematic scoping review of the literature to discover how CoPs and similar structures, such as knowledge networks, have been evaluated. This scoping review included frameworks that can inform the evaluation practices of any CoP or knowledge network. The paper described the components of each framework, as well as the field and setting in which it was generated. The review provided an outline of and reference point on evaluation frameworks, data collection tools, indicators, analytical approaches, and key considerations. It also provided practical information for evaluators and network practitioners regarding the current state of literature and possible frameworks available for adaptation to their own CoP and knowledge network evaluations. The
strengths of this review resided in the systematic nature of the search, the data extraction, and, perhaps most importantly, the assessment of the utility of the results as a starting point for future evaluations of CoPs in ecosystem health. The paper discussed the results that characterized CoPs as complex interventions, and summarized approaches to evaluating CoPs and networks in ecohealth. One point that clearly emerged was the importance of considering heterogeneous membership of CoPs.

6.2.2 Paper 2 summary

This paper began with the characteristics of CoPs and introduced a typology that characterized them as either inter-, intra-, or extra-organizational communities of practice. After drawing attention to the striking absence of evaluation frameworks that were being applied to extra-organizational CoPs, the paper critiqued current evaluation approaches. Foremost among these concerns was the lack of systematic consideration of the levels of analysis or impact of CoPs. The paper then proposed a new evaluation framework for extra-organizational CoPs, describing its components and suggesting application strategies.

The proposed evaluation framework has two key dimensions for which the value of a CoP is considered. These are the type of value, adapted from Wenger et al.’s (2011) Value Creation Framework, and the level of analysis, that is, who or what is experiencing or being influenced or affected by the value created. By looking at these two dimensions (type of value and level of analysis), a more systematic evaluation of CoPs is possible. The proposed evaluation framework offers a comprehensive typology that can be applied in both the planning and implementation stages of an evaluation of an extra-organizational CoP. The proposed framework provides a heuristic that can be applied at multiple points in the life cycle of a CoP, and could be used for formative or summative evaluations. The evaluation framework can be modified and elaborated to suit the specific needs of a particular extra-organizational CoP.

6.2.3 Paper 3 summary

The objective of Paper 3 was to assess the applicability of the proposed evaluation framework by engaging members of an extra-organizational CoP through a qualitative approach. Specifically, the paper addressed the following question: How well do the dimensions of the Evaluation Framework help to capture the value created by extra-organizational CoPs? The evaluation
framework was used as follows: 1) to develop the interview guide, with sections of the guide devoted to each level, and probing questions relating to some of the types of value; 2) to structure the deductive analysis, that is, coding text as it applied to a level of analysis, a type of value or both; and 3) to report and to display data.

I described the data focusing on individual and collective value followed by a summary of the value at the other levels of analysis. Analyses revealed that most of the data related to motivation and participation value, relational value and knowledge and cognitive value; and limited data directly related to applied, realized, and reframing value. While data mostly highlighted generated value, some of the data represented a particular value that had not been achieved. The coding approach allowed additional themes or sub-themes to be identified that could be layered onto the deductive framework. In particular, ‘not realized’ or ‘aspirations’ were additional sub-themes. Reflecting on the approach provided the opportunity for sharing lessons learned regarding the application of the evaluation framework and for making refinements. Through this application, the evaluation framework proved to be comprehensive as a tool to understand the generated and useful in sharing results with members of the CoPEH and the field more broadly. This study demonstrated that the evaluation framework proposed in Paper 2 is able to capture the value generated by an extra-organizational CoP. That is, the types of value in the evaluation framework corresponded with those expressed by interviewees. This is a learning opportunity for members, the CoP and others interested in extra-organizational CoPs.

6.2.4 Integration

Figure 6.1 provides an overview of the three studies, outlining the relationships between the research questions, methods/approach, outputs, key findings, key implications and contributions, and future research. While outputs are not traditionally discussed as contributions of dissertations in this field, this work produced tools that can be used by researchers, evaluators, or CoP members. In the field of evaluation, these tools would be considered “outputs”. Outputs are distinct from findings in their degree of tangibility. In some cases, the outputs come before findings in the sequence of the study, particularly in Study/Paper 1 (left-most column of Figure 6.1) where the scoping review led to a compilation of frameworks, and the findings required examination of that set of frameworks. In Studies/Papers 2 and 3, the outputs are both key steps in generating the findings (e.g., data set) and are a final product that was developed based on
findings (e.g., refined evaluation framework for extra-organizational CoPs). This is why we see both upward and downward arrows between outputs and findings in Figure 6.1.

The figure also illustrates connections between the three papers (dotted arrows). All papers address the overarching objective of understanding how CoPs can be evaluated in a way that informs both the way they function and the value that they generate. The research questions for each of the papers relate to this overall objective and are designed in sequence to build off each preceding paper. Areas of future research inform the research question for the following study; these sequential connections are highlighted by the bold dotted arrow. Paper 1 found that the majority of existing evaluation frameworks for knowledge networks and CoPs were designed for CoPs within organizations, in particular, for-profit organizations. This gap identified in Paper 1 became the purpose of Paper 2, to propose an evaluation framework suitable for extra-organizational CoPs. The proposed future research of Paper 2 was application and testing of the evaluation framework; Paper 3 addresses this need. Additionally, the output from each previous paper fed into the methods of the following paper. The review conducted for Paper 1 and the output of the compilation of frameworks fed into the methods of Paper 2 which took a more critical look at the frameworks, informed by additional literature review. The key output of Paper 2, an evaluation framework for extra-organizational CoPs, fed directly into the methods of Paper 3, where it was used to develop the interview guide and structure the analysis. As an additional connection between Papers, insights regarding the heterogeneous membership of some CoPs discussed in Paper 1, fed into consideration of the sampling strategy for Paper 3.

Section 6.4 and tables 6.1-6.3 provide additional description of the outputs and findings, and the corresponding implication and contributions but before turning to these, I will share insights gleaned during application of the evaluation framework.
Figure 6.1 Overview and integration of the three papers
6.3 Lessons Learned in Applying the Evaluation Framework

In applying the proposed evaluation framework for extra-organizational CoPs, I came across a number of challenges that should be highlighted to evaluators and CoP members. These lessons learned stem largely from the work of applying the evaluation framework (Chapters 5) and are offered as a supplement to the discussion of the application of the evaluation framework in Chapter 4. These lessons may also be applicable in working with other evaluation frameworks for CoPs such as those included in the scoping review (Chapter 3). The following section uses data collected as part of the qualitative application of the framework to illustrate the points made.

6.3.1 Value for/value by

One issue requiring close attention in the analysis was whether the data was an example of value for a level of analysis (e.g., for an individual, for an organization, for external stakeholders), or value generated by a level of analysis (e.g., by the individual, by the collective). This was primarily an issue for the collective levels, however there were also many examples of individuals creating value. Distinguishing value for versus value by the collective was a challenge since they are not mutually exclusive. In coding, this was addressed by developing two sub-codes for each level (collective creation of value, and value for/effect on collective) to comprehensively capture these distinctions. The following quotes are examples of text that would be coded as both value for and value by: “I mean what it ended up doing in our research project is it gave us a vocabulary. It gave us a goal. And I think that what we ended up doing was making a real concerted effort towards that [goal]” (F30), as opposed to just value for, for example “…It was until we were actively connected with the community of [place]…that we actually figured out how to work together” (H17) and value by “I’ve always thought about our mission as…the creation of these transdisciplinary spaces to bring people together to have really interesting conversations” (O43). Evaluators and CoP members should be attuned to both.

6.3.2 Boundaries of levels and value

Another issue requiring attention was the overlap between the levels of analysis and between types of value. Notably, the findings demonstrated an overlap between relational value and learning/knowledge value. This overlap is aligned with CoP theory. If one considers learning as
“an evolving set of relations” as is the case with CoP theory (specifically situated learning theory), this overlap could be anticipated because learning, becoming a member, and changes in relationships within the CoP are seen to go hand-in-hand. Overlap also occurs at the level of analysis and requires the evaluator to be attuned to the relationship between levels. As an example of the overlap between the levels of analysis, a change in an individual member’s practice can be related to increased application of ecohealth approaches, that is, increased value at the field level. This is demonstrated in the following quote: “But after going to that course and engaging with the people there, I guess I came away thinking that no matter what my project… is now, I want to make sure that I’m using ecosystem approaches to health principles” (L26). In this analysis, overlap was notable both at the collective level (CoPEH-Canada) and the field level (ecohealth). For many members, CoPEH-Canada is an exemplification of Ecohealth, and interviewees would, at times, move seamlessly between speaking about CoPEH-Canada and Ecohealth, making no distinction between the community of practice and the field. Evaluators will need to be aware of these overlaps, as they might lead to use of multiple codes for the same section of text, and more importantly to an opportunity for interpretation of mechanisms across levels.

6.3.3 Achievements and aspirations

Another key consideration is being clear about achievements, aspirations and the timelines in which people discuss value. Our interview guide focused on past and present practices, but also included some aspirational-type questions related to changes in CoPEH-Canada. To deal with the different types of responses when members were talking about value, I developed additional sub-codes to distinguish aspirational statements, as well as value that was not achieved. For example, the following quote would have been coded as (applied value, collective, not achieved). “But it doesn’t feel like anything’s actually shifted. It feels like it’s just sort of our vocabulary that shifted and maybe our goal. But in the concrete practice, I feel like not a lot changed” (F30). Wenger et al (2011) suggest both a “ground narrative” and “aspirational narrative” as an application of their Value Creation Framework, and that the tension between these two is a space for learning. A similar approach could be taken with the proposed evaluation framework. If a community of practice has a formalized set of objectives or outcomes they are looking to achieve, results (themes from the interviews) can be compared against these. Analysis can look to assess if objectives are achieved, a potential measure of success. Additionally, examining the
alignment between members’ views of the CoP and the formalized version of the CoP could be a potential measure of the level of cohesion of the CoP. Regardless, timeline, expectation and aspirations are important considerations in design and analysis of evaluations for extra-organizational CoPs.

6.3.4 Realized value and attribution

Realized value was particularly difficult to demonstrate, although, as shown in Table 5.2 (in Chapter 5), there was at least one quote related to this value for all levels, except the collective level. Realized value is more distal on the causal pathway and the CoP is likely only one of several contributing factors. This challenge was acknowledged by some of the interviewees. It is worth noting that realized value, especially at the organizational and external stakeholder levels, is beyond a CoP’s control, but still within their sphere of influence. It is important to consider the spheres of influence of CoPs particularly if making judgments regarding their success. CoPs should not necessarily be accountable for realized value, especially for levels beyond the collective (Montague & Porteous, 2013). Related to this issue is the challenge of attributing value to a CoP. Again, several interviewees discussed this challenge and although there were some examples, it was rare for interviewees to trace the causal pathway from participation in CoPEH-Canada to realized outcomes, especially beyond the individual level. Evaluators should be aware of the challenge of capturing attribution or evidence of causal pathways. When interpreting results, evaluators should consider the extent to which a CoP can expect to achieve the more distal types of value (e.g., realized) and the extent to which they could be accountable for achieving them (e.g., by funders). If capturing realized value was a priority for the evaluation, expanding it to include longitudinal evaluations, greater documentation, or additional interviews with long-term members and external stakeholders would be necessary.

6.4 Implications and Contributions

The broad aims of this research were to develop and apply a framework to evaluate a community of practice and, in the process, to build greater understanding of extra-organizational communities of practice. This dissertation makes practical contributions for evaluators, CoPs members and other stakeholders; it makes methodological contributions through the development and refinement of an evaluation framework; and it makes a theoretical contribution
by expanding the framing for evaluations of extra-organizational CoPs, in particular about value generated and at what levels of analysis. The next sub-section lays out implications by paper, before drawing on the same content to describe the practical, methodological and theoretical contributions in separate sub-sections (6.4.2-6.4.4).

6.4.1 Implications by Paper

The tables below link the outputs and findings from each paper (as per section 6.2 above), to the implications, possible uses, and contributions of each.

Table 6.1 Linking outputs and findings to implications/contributions of Paper 1

<table>
<thead>
<tr>
<th>Output/Finding</th>
<th>Implication/Contribution</th>
</tr>
</thead>
</table>
| • Compilation of frameworks proposed or used to evaluate CoPs or knowledge networks, with description of purpose and key components of each framework | • Evaluators and CoP members interested in evaluation can turn to this set of frameworks for approaches, frameworks and tools that may support their evaluations  
• Building an understanding of how CoPs and knowledge networks are being evaluated |
| • Description of the testing and application of the above frameworks, including methods and authors’ conclusions | • Provides examples of how these evaluation frameworks could be used  
• Building an understanding of how evaluation frameworks are applied or tested |
| • Discussion of applicability of above frameworks to CoPs and networks in the field of ecohealth | • CoPEHs and networks in the field of ecohealth are directed to certain frameworks as being more applicable to their form, setting and goals: in particular, frameworks that address the heterogeneous membership |
| • Description of CoPs as complex interventions and review of the above frameworks in addressing the evaluation challenges of complex interventions | • Highlights the importance of selecting an approach to evaluation that can address the challenges of complex interventions |
Table 6.2 Linking outputs and findings to implications/contributions of Paper 2

<table>
<thead>
<tr>
<th>Output/Finding</th>
<th>Implications/Contribution</th>
</tr>
</thead>
</table>
| • Proposed a typology of CoPs as they relate to organizational setting  
  • Clarified diverse terminology in referring to organizational setting | • This draws attention to the organizational context of a CoP as a key factor that shapes the characteristics of a CoP and approaches to its evaluation |
| • Proposed an evaluation framework suitable for extra-organizational CoPs that offers a comprehensive consideration of types of value and levels of analysis | • Evaluators and CoPs members can use the proposed evaluation framework in planning and implementing evaluations, including formative or summative evaluations |
| • Proposed several applications for the evaluation framework | • Helps evaluators and CoPs members understand how the framework can be used |

Table 6.3 Linking outputs and findings to implications/contribution of Paper 3

<table>
<thead>
<tr>
<th>Output/Finding</th>
<th>Implication/Contribution</th>
</tr>
</thead>
</table>
| • Semi-structured interview guide that aligns with the proposed evaluation framework | • Tool for evaluator and CoPs members to use or adapt in qualitative data collection  
  • The combination of the evaluation framework and interview guide is useful in learning about value generated by CoPs |
| • Demonstrated applicability of the proposed evaluation framework in capturing value generated by an extra-organizational CoP | • Provides an example of how framework can be used in analysis and reporting of qualitative data  
  • Build the body of evidence to support evaluation strategies incorporating the framework |
• Refined the proposed evaluation framework
• Clarified concepts and expand the definition of some types of value

• Improved framework can help guide evaluators and CoP members to better evaluations. Thus, evaluators, researchers and CoP members can use the proposed evaluation framework to learn about CoPs as a way of contributing to their success

• Described value generated by CoPEH-Canada

• Learning about CoPEH-Canada and how it could extend the value created

6.4.2 Practical Implications

As a key practical contribution, this dissertation produced a framework that can be used in evaluating extra-organizational CoPs (and possibly other types of CoPs). As an evaluation framework, it can potentially have a number of benefits in evaluating extra-organizational CoPs. For example, its use in the planning stage of an evaluation can promote evaluative thinking and prioritization of evaluation needs and wants before embarking on an evaluation or applying any particular tool. A key benefit of this and other evaluation frameworks is their usefulness in facilitating the negotiation of evaluation questions, approaches and methods – overall getting to a situation where stakeholders understand what is being measured and why it is being measured, and are in agreement. The framework could provide “a neutral ground” for stakeholders to discuss their interests, as was found to be useful with other evaluation frameworks (Liket, Rey-Garcia, & Maas, 2014). Early involvement contributes to learning from the evaluation process and to use of evaluation results (Liket et al., 2014). This has implications for evaluators as well as stakeholders (CoP members and others). The framework can also be used in implementing an evaluation (e.g., to support data collection, as demonstrated in Paper 3).

Reporting on the application of evaluation frameworks can confirm their potential utility and build the body of evidence to support evaluation strategies incorporating a particular framework. Examples of application can improve a framework’s usefulness by demonstrating to evaluators how it can be applied and adapted. Applying the proposed evaluation framework in this dissertation highlighted the need to clarify concepts and expand the definition of some types of value. These changes, which are outlined in Paper 3, will help guide evaluators and CoP members to better evaluations. Thus, evaluators, researchers and CoP members can use the
evaluation framework to learn about their CoPs as a way of contributing to their success (Probst & Borzillo, 2008).

The proposed evaluation framework may not be suitable for all CoPs. As suggested in Paper 1, one should consider the community type, its setting, the learning needs of the community, the key evaluation questions, and the desired application of evaluation processes and results. Through the systematic scoping review, this dissertation describes a range of evaluation frameworks that could inform or be used in CoP evaluations. This description can be a resource for evaluators, so that they can select a framework based on fit for the context and goals of the CoP, and their evaluation needs.

6.4.3 Methodological Contributions

The contribution of the proposed evaluation framework, which improves upon existing frameworks, is the addition of the levels of analysis. In reviewing the structures or different dimensions used in evaluation frameworks for CoPs, we found a limited consideration of levels of analysis in evaluating a CoP; often focusing on individual community and organization, without considering external stakeholders or the field (the latter two being the proposed additional levels of analysis and relevant for extra-organizational CoPs). In addition, levels of analysis were not always considered; in particular they are not considered in Wenger’s Value Creation Framework, which has become a popular framework in the literature (based on citations). The proposed evaluation framework provides scaffolding for organizing ideas, data and discussion in a way that includes the examination of the relevant and multiple levels of analysis. A full consideration of multiple levels of analysis facilitates capturing multi-scalar and multiple outcomes of a CoP. This is an important consideration in evaluation, particularly when evaluating complex interventions such as CoPs. The systematic consideration and differentiation of these multiple levels of analysis may prevent the levels from being conflated, essential for improving evaluations and, in particular for synthesizing findings across evaluations. This could lead to a fuller and more nuanced understanding of CoPs and the value they generate which could inform the development and effectiveness of CoPs. Additionally, differentiating types of value by level of analysis is essential for improving evaluations as well as synthesizing findings across evaluations. The proposal of the evaluation framework is the key methodological contribution of this dissertation.
Similar to the study of alternative evaluation approaches (Stufflebeam, 2001), the study of evaluation frameworks is important to the advancement and operation of the field of program evaluation. A critical view of evaluation frameworks and their application can help evaluators and CoPs members “consider, assess and selectively apply evaluation frameworks” (Stufflebeam, 2001, p. 9). In reviewing existing approaches (or frameworks), we uncovered their strengths and limitations, and potential applicability to the CoP(s) of interest. As an additional methodological contribution, Paper 3 helped to determine how and when the proposed evaluation framework would be best applied, and how improvements to the framework could be made.

6.4.4 Theoretical Contributions

Paper 1 described CoPs (and CoPEHs) as exhibiting elements of complex interventions. As outlined in Paper 1, a complex intervention has characteristics of nonlinearity, emergence, adaptation, uncertainty, dynamic interactions, and co-evolution (Patton, 2011). Paper 1 drew attention to the associated evaluation challenges: the emergent nature of activities and outcomes, multiple scales of impact, long timelines of impact, hard-to-measure/intangible outcomes, and challenges of attribution/contribution. It also outlined how evaluation frameworks might help address these challenges. Seeing CoPs as complex interventions influences the approaches to evaluation used. The argument of CoPs as complex interventions as presented in Paper 1 has been used to support use of development evaluations of CoPs by Van Winkelen (2016).

The dissertation also calls attention to gaps in understanding of CoPs. For example, Paper 1 points out the fact that many of the frameworks encompassed in the review did not include approaches for heterogeneous membership. This is not surprising, given homogeneity has been used as a characteristic to describe CoPs (Fischer, 2001), and many of the frameworks were developed within an organizational setting in which less heterogeneity in membership would be more likely. Of particular note, transdisciplinarity was not broached in the reviewed frameworks. These gaps feed into foci for future research, detailed in the next section.

This dissertation contributes to the understanding of CoPs by distinguishing between types of communities of practice. It does so by calling attention to organizational setting as a typology of CoPs, specifically distinguishing between and clarifying the meaning of *inter-organizational*, *intra-organizational*, and *extra-organizational* CoPs. While the concepts are not new (Paper 2 provides examples of works considering each type of CoP, including some that have used
alternative terms), this distinction allows us to see that the majority of CoP literature, including seminal works, has largely focused on intra-organizational CoPs and that there has been limited work focused on extra-organizational CoPs. I discussed the latter’s unique needs in evaluation stemming from their different ways of defining success, different factors contributing to their success, and different evaluation priorities.

The findings from the qualitative application of the evaluation framework contributed to our theoretical understanding of CoPs. In applying the evaluation framework through qualitative interviews, I believe that useful insights were revealed regarding the value produced by CoPs. In particular, the dissertation provides examples and description of value generated, which can lead to an understanding of the multiple pathways of generating value and the ‘virtuous circles’ of CoPs. This virtual circle is where, as Thompson (2005) describes it, “the more people participate, the more they learn, and the more they identify with and become prominent within a group, becoming more motivated to participate even further, and so on” (p. 152).

Results showed a number of motivating forces that either helped initiate or sustain participation. Motivation may come first from feelings such as frustration with external context and structures, (“[I] got just really frustrated with that lack of holistic thinking, and so needed something else to fill that void”(O43)), but the ‘pay-off’ from participating becomes a motivating factor itself, often at the individual level and often stemming from relational value. Modeling at an individual and collective level was a motivating factor in participation and sustainment of participation in the CoP. As an example of this: “knowing that there were other people who made a career of it was really important to me too” (D22); and from a collective level: “showing the potential to lurk in a sort of collaborative way towards some of the bigger problem…It’s okay to see grant applications coming in that [use] this sort of approach” (M19). This brief analysis shows the cycle of participation, from motivation, to intangible value and back to participation, as a clear example of virtuous circles (Thompson, 2005). There was also another circle noted in the data, which represents more and varied tangible value. The more tangible value started early on and acted as a coalescing agent to generate further value, but the type of tangible value expanded as the community of practice developed. As example, CoPEH-Canada developed a course and through that built relationships and experience that they were able to leverage in organizing an international conference. These findings are meaningful as they offer insight into the motivations of CoP members and the impacts of a CoP’s processes.
6.5 Limitations

The limitations of each of the studies are discussed within their respective Chapters. This section revisits the limitations of each Paper and expands on the limitations of Paper 1 in light of advancements in the scoping review methodology. It also includes additional discussion of Paper 3 limitations, as this is the culminating study of this dissertation.

6.5.1.1 Paper 1 limitations

A limitation of Paper 1 was an issue of breadth. While the scoping review did include a broad scope of evaluation frameworks from multiple disciplines, it did not include all potentially useful frameworks. Several types of frameworks were not considered although they might have provided useful tools or offered key insights. For example, lessons could be learned from frameworks focusing on other forms of collaborative partnerships, such as research networks (Fenton et al., 2007). Furthermore, books, which were excluded from the review, are also potential sources of guidance in evaluating CoPs and knowledge networks. For example, Stein et al. (2001) highlight important evaluation questions for knowledge networks to consider in their book *Networks of knowledge: Collaborative innovation in international learning*.

Since the time of publication of Paper 1 (McKellar et al. 2014), there have been advancements in methodology and methodological debates concerning scoping reviews. Notably, Peters et al. (2015) published a methodological paper offering guidance for conducting systematic scoping reviews. Despite being published prior to the guidelines, the methods of Paper 1 followed a structured and explicit procedure, meeting many of the guidelines established in the interim by Peters et al. (2015). These included: working with pre-defined objectives and methods, detailed inclusion criteria, and comprehensive search systematically tracked and displayed in a flow chart. However, to address challenges of feasibility, each stage was not conducted in duplicate while other measures were taken to ensure quality (such as reviewing a random selection in duplicate). The adapted methods allowed quality checking throughout the process, therefore limited impact on review quality is expected. One should note that modifications to systematic review methods do not necessarily result in increased bias, for example reviewing titles only prior to titles and abstract was shown to be more efficient without changing the final results (Mateen, Oh, Tergas, Bhayani, & Kamdar, 2013).
6.5.1.2 Paper 2 limitations

The limitations of Paper 2 relate to limitations of the framework itself. The structure of the framework is a grid that crosses types of value and levels of analysis. Thus, it shows the types and level of value as discrete. The issue lies in the fact that CoPs are complex and the different types of value they can generate are highly cyclical and interrelated. For example, as members of CoPs work and learn together, they develop a joint or collective history of learning and a shared repertoire that could be in the form of techniques, tools, stories or perspectives. In turn, these can promote further learning within the CoP or, under certain conditions, work as a barrier to the entry of new members and ideas. Additionally, the framework in itself does not outline the connections between the cells and therefore is unable to answer explanatory questions about how and why the CoP works, without additional program theory development. As a further limitation, it is worth mentioning that the language used within the framework may create a challenge for different fields. The evaluation framework uses the term value, not to align the framework with economic or management evaluation, but to select a more encompassing term and to align with key CoP literature.

6.5.1.3 Paper 3 limitations

There were a number of limitations of the approach used in understanding how well the framework captures CoP value. While the study did not aim to validate the proposed evaluation framework, this first application was a step toward validation. The interviews were conducted with a limited number of CoPEH-Canada members. Interviewing additional members would have allowed more exploration of heterogeneity within the CoP. By interviewing non-members (e.g., representatives from members’ organizations, people who participate in the field of ecohealth but are not CoPEH-Canada members), we could obtain a better sense of whether the framework captured value at the organization, field and external stakeholder levels. Additionally, the approach was cross-sectional, although it did ask participants about past experiences and changes that interviewees would like to see in the future. Interviewing members at different points in time would offer greater insight into the breadth of value. It is expected that as a CoP matures, the types of value it generates will shift, with a greater opportunity to generate and capture value toward the right-hand side of the framework (i.e., applied, realized and reframing value) during later stages of CoP maturity.
Limitations also related to positive bias. Interviewees may have been more likely to express or share positive aspects of their participation given the nature of the interview questions and general social response bias. It is worth noting that participation in extra-organizational CoPs (including in CoPEH-Canada) is voluntary and thus one would expect that members feel positively about their involvement in CoPs or the CoP itself, even if they are critical of it. The framing of ‘value’ rather than, for example, process and outcomes may have been challenging as well as switching between what is working and what can be improved (Van Winkelen, 2016). These challenges were mitigated by prolonged engagement and attention to scripts (e.g., using identical language to that used in reports or taught in course). However, the tensions and areas for improvement within CoPEH-Canada are probably underrepresented in this dissertation.

Finally, given that the evaluation framework was applied in a single case example, any source of discrepancy between the data and the framework could not be readily identified. For example, if a value was not well demonstrated, it might point to improvement needed in the interview guide or evaluation approach (e.g., focusing on interviewing members only), rather than a demonstration that this value was not generated within the CoP, or that removal of that particular aspect from the framework was warranted. While the intent of Paper 2 was to produce an evaluation framework that would be useful to multiple extra-organizational CoPs, it is not possible to demonstrate such applicability in a single example, additional application would be needed to address this aim.

6.6 Directions for Future Research and Evaluations

This dissertation points to additional questions to be addressed towards a better understanding of how to evaluate CoPs, in particular extra-organizational CoPs. Below, I outline key directions for future research and evaluation. These focus on: developing a database of tools and frameworks useful in evaluating CoPs; testing of the proposed evaluation framework using different approaches to evaluation in different settings, or with different types of CoPs; and using the data collected though this and other applications of the framework to expand our understanding of how CoPs work, particularly extra-organizational CoPs.
Additional review of frameworks and testing of evaluation frameworks for CoPs

- Paper 1 provided an overview of evaluation frameworks for CoPs, however, since the time of publication, a number of frameworks have been developed and several have been applied or tested. A compilation of frameworks and data collection tools would be of use to evaluators and CoP members. An environmental scan or extension of the literature could identify useful tools.

- Future research pertaining to Paper 1 could explore how evaluation frameworks, methods, and approaches can match particular types of CoPs and their objectives, thereby informing insights on how best to evaluate a particular CoP. An exploration that matches frameworks to CoPs could be useful in answering questions such as: ‘Are there key outcomes that should be measured in the early stages (e.g., relationship building) that become less relevant after a CoP is well established?’ or ‘What approaches are best for dispersed multinational, or multi-linguistic networks, found in several of the CoPEHs?’

Applying the evaluation framework with different approaches and with different CoPs

Paper 2 proposed a number of possible applications of the framework; this dissertation assessed the proposed evaluation framework using a qualitative approach in a single qualitative case example (in Paper 3). Additional application would further assess the strengths and weaknesses of the framework. Below I outline applications that would help to demonstrate appropriateness of the framework or uncover gaps in its applicability.

- The framework could be applied as a tool in the planning stage of an evaluation in order to facilitate consensus building for stakeholders’ evaluation priorities. Future evaluations can use this framework as a starting point when planning an evaluation and future research could assess the utility of this tool in supporting consensus building, evaluation priority setting and broader stakeholder participation in evaluation planning.

- As a tool in guiding the implementation of evaluations, the evaluation framework could help to organize and interpret data, whether it is participant interviews (as shown in Paper 3), field observations, or document reviews, each potentially generating key performance indicators of a CoP. Future research should address the validation of the framework by
applying it with different approaches, including mixed methods or quantitative approaches.

- Reflection on additional applications could also address questions such as ‘What are the best techniques for understanding and measuring each value at each level of value?’

- The application of the framework in Paper 3 focused on individual and collective value. To better assess the applicability of the framework in capturing value at all levels of analysis, future research should focus on collecting data at the organizational, external stakeholders and field levels explicitly.

- Further validation work should entail applying the evaluation framework to other and multiple extra-organizational CoPs. In particular, other CoPEHs would be worthwhile examining in more depth. The choice of cases; which extra-organizational CoPs and their context, will have implications for what is learned.

**Learning about CoPEH-Canada and Understanding CoPs**

- Paper 3 collected rich, qualitative data and used a deductive approach to analysis. With this same data set, or an extension of it, other evaluation and research questions could be addressed. In particular, the data can be used to explore the possible mechanisms related to the value generated, particularly at the individual and collective levels. Mechanisms are not explicitly a part of the proposed evaluation framework but are ways of generating (or hindering) value.

- Exploring mechanisms might be a starting point to examine the relationship between CoPEH-Canada and the field of Ecohealth to learn about the relationship between CoPs and their field(s).

- A potential area for future research is an exploration of CoPs in academia and the influence on students’ participation in academia. A next step, therefore, might be to focus on the more social-theoretical explorations of the role of the academic context and examine the contribution of academic CoPs to academia.
This research did not address reasons why value was or was not generated. While not a goal of this study, this information would be valuable to CoPs looking to develop and improve.

Of particular note, a focus on context was absent from this analysis. As Roberts (2006) outlines, “the context within which a community of practice is embedded is a major factor determining its success as a means of creating and transferring knowledge” (Roberts, 2006). Future approaches could include explorations of context and describe how considerations of context can be included in the evaluation framework. Including related questions in the interview guide and broadening the sampling frame with a focus on organization, external stakeholders and the field would support an understanding of context, particularly if value and context were examined across different CoPs.

This research highlighted a gap in the community of practice literature with respect to integrating heterogeneous knowledges and in developing transdisciplinary practice. Additional research and evaluation with transdisciplinary CoPs may aid in understanding how they can be successful, as well as what could be anticipated with respect to value generated. CoPEH-Canada, and other CoPs and networks in Ecohealth would be rich ground for exploring transdisciplinary elements in CoPs and networks.

A larger sample size in case studies would allow for thematic comparisons between different roles within a CoP such as early career/“novice”, late-career new members/“newcomers” and core/“expert” members.

6.7 Conclusions

This dissertation research produced an evaluation framework for extra-organizational CoPs. The framework is comprehensive in that it includes levels of analysis and types of value. The application of the framework in Paper 3 showed that the evaluation framework is able to provide a guide for the implementation phase, specifically, collecting and analyzing data and framing results. The findings gained as a result of applying the framework were used to refine the framework and to better understand the possible value generated by CoPs. The synthesis of results and their interpretation will contribute to the knowledge base related to CoP value generation and to the broader field of evaluation.
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Appendix A: What are CoPEHs or communities of practice in ecosystem approaches to health?

Published as Supplementary Material with Paper 1

**Overview of Communities of Practice in Ecosystems Approaches to Health (CoPEHs)**

CoPEHs are groups of individuals (with organizational and institutional connections) who are committed to the field of ecohealth. CoPEHs often have cores of researchers with high levels of commitment to capacity building in ecosystem approaches, as well as peripheral members with varying levels of engagement. CoPEHs are dispersed, but they tend to have a nodal structure. Due to the geographical distance (e.g., across countries, across continents) at which CoPEHs operate, they often communicate virtually. The domain of interest of the CoPEHs is ecosystem approaches to health, however they do engage in multiple, diverse practices. The regional CoPEHs build off existing capacities and have varying foci, including emerging infectious diseases, occupational health, as well as ecohealth training and scholarship. Capacity building is a central focus of the CoPEHs, often in groups with courses and workshops; individual participants build their own skill and knowledge through participation. Developing and engaging in collaborative networks aligns with ecohealth principles, particularly those concerning participation and knowledge-to-action.

Most CoPEHs were made possible through support from the International Development Research Centre (IDRC) for networking and capacity building activities (De Plaen & Kilelu, 2004; Parkes et al., 2012). Consultation initiated by IDRC identified three core functions of any ecohealth network or community of practice: to create an ecohealth peer community, to develop research capacities in ecohealth, and to enhance the uptake of ecohealth research and its influence on policy and practice (Flynn-Dapaah, 2003; Parkes et al., 2012). While IDRC contributed to the original ideas of the CoPEHs, there is now a wide range of influences (Charron, 2012b). Mutual exchange and learning are not bound by the CoPEHs, and neither are the multiple dialogues that define the field (Charron, 2012b; De Plaen & Kilelu, 2004).
**Methods (Search Strategy)**

The synopsis above was based on a scan of available literature and CoPEH related web resources, as well as participant observation. The scan used Google Scholar and Scopus with the search terms “community of practice” or “communities of practice” in combination with “ecohealth” or published in the EcoHealth journal. Titles were scanned for relevance. Only the titles from the first 60 Google Scholar results were reviewed due to limited relevance. Twenty-nine full texts were reviewed with seven articles explicitly including information about ecohealth collaborative structures. The web search was conducted by looking for websites of known CoPEHs and related organizations.

**Results - Relevant material from literature and web search**

**Articles, reports, theses**


Websites

American University of Beirut Faculty of Health Sciences (n.d.) CoPEH-MENA


COPEH-Canada (2014) CoPEH-Canada: Canadian community of practice in ecosystem approaches to health with an ecohealth training and awards program


CoPEH-SSEA (n.d.) Community of Practice in Ecohealth - South and South East Asia CoPEH-SSEA Available:https://sites.google.com/site/veterinairessansfrontieres/ [accessed February 07, 2014]


International Development Research Centre (n.d.) Ecosystems and Human Health: COPEHs Continue to Sow Partnership Seeds
Available:http://www.idrc.ca/EN/Programs/Agriculture_and_the_Environment/Ecosystem_Approaches_to_Human_Health/Pages/ArticleDetails.aspx?PublicationID=838 [accessed February 07, 2014]


Results- Material from search not deemed relevant

A number of sources did not provide information on ecohealth collaborative structures. Many of the articles focus on, or include information on, the evolution of the field of ecosystem approaches to health. The evolution in the field occurs through the interaction of those participating in ecohealth in the global contexts. However, if the articles did not describe the collaborative structure of researchers, practitioners, policy-makers and/or communities involved in ecohealth, they were not included in the material above.


Rweyemamu, M. M., Kambarage, D., Paweska, J., & Sandrigham, J. TOWARDS ONE AFRICA, ONE HEALTH The SACIDS One Health Virtual Centre for Infectious Diseases.


Appendix B: Inclusion and Exclusion Criteria

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Inclusion

- Frameworks, used or proposed, to assess, evaluate, or understand the connection between process, structure and/or outcomes of knowledge networks
- Frameworks, used or proposed, to assess, evaluate, or understand the connection between process, structure and/or outcomes of groups labeled ‘community of practice’
- Frameworks, used or proposed, to assess, evaluate, or understand the connection between process, structure and/or outcomes of that groups of people developed using CoP and/or other related theories (e.g., situated learning theory, legitimate peripheral learning) (Li et al, 2009b)
- Frameworks, used or proposed, to assess, evaluate, or understand the connection between process, structure, and/or outcomes of learning and knowledge sharing within a group or network context
- Evaluations of CoP(s)/KN(s) as the unit of analysis
- Journal articles, reports, conference proceedings

The following evaluation approaches and methods are accepted

- Knowledge/theory testing questions related to operationalizing the characteristics of CoPs
- Formative inquiry questions related to CoP/KN development
- Summative evaluation questions related to determining the merit/worth of CoPs/KNs.
- Qualitative, quantitative or mixed method evaluations
Exclusion

- Models, theories and/or conceptual frameworks that only document or describe CoP or network processes (i.e., and do not include description of an evaluation framework or methods, or do not evaluate some component of the KN/CoP) (Van Eerd et al 2011)
- Evaluations of a program, policy, practice, or intervention in which no community of practice question/objective is answered/addressed (e.g., evaluating clinical interventions, health services, curricula, quality improvement studies, health promotion programs, and training programs that occur outside of community of practice/defined network) (Van Eerd et al., 2011)
- Evaluations of networks that are not some form of learning partnership
- Evaluations or analysis that only confirm the existence of KN/CoP
  - Articles that use SNA to describe the structure only
- Evaluation of initiative or program to promote the creation/development of CoPs/knowledge network (i.e., did initiative X result in a CoP)
- Evaluation in groups that share a common profession that are not part of a social-professional network (i.e., where mutual engagement is not present)
- Evaluations of research networks, where social-professional relationships and knowledge sharing is not part of the evaluation (e.g., clinical trial networks that feed data into a common study).
- Education or learning initiatives that do not occur within an already established CoP (e.g., evaluation of a new situated-learning curriculum for medical students, establishing learning communities in first year students, evaluation of classroom learning communities)
- Service-delivery networks (i.e., networks with shared referral patterns)
- Studies of ‘community practice’, as in health care service delivery in the community
- Clinical studies (clinical intervention, clinical outcome)
  - Note: in some cases these can occur within a practice based research network, these should still be excluded
- Evaluation of technology (even if that technology promotes learning within a CoP)
- Evaluations of Computer/software network
  - Note: virtually learning communities are still to be included
- Books, book chapters, posters

References


Appendix C: Critique and Clarification of Scoping Review Terminology

The emphasis on evidence-based practices has stimulated the growth of reviews, in both quantity (Bastian, Glasziou, & Chalmers, 2010) and type (Grant & Booth, 2009). Review methods have also been undergoing development (Gough, Thomas, & Oliver, 2012). Scoping reviews in particular, have been gaining ground in recent years, with the first attempt to describe the approach and methods undertaken by Arksey and O’Malley (2005). However, with this proliferation there has been a decided lack of consensus with terminology used in scoping reviews. O’Brien et al. (2016) draw attention to the confusion regarding what a scoping review is, especially when compared to a scoping study. Many consider systematic characteristics to be what differentiate scoping reviews from literature reviews, but even here there were mixed opinions (O’Brien et al., 2016). Looking back, it was not until the Colquhoun et al. (2014) commentary on definitions, methods and reporting of scoping reviews that a systematic approach was added to the existing definition of scoping reviews/studies. Earlier in scoping review developments, Grant and Booth (2009) suggest the term “systematized” to describe a review that includes elements of systematics reviews, but that does not adhere to the commonly accepted guidelines (e.g., Cochrane Collaboration). This term did not catch on and systematic scoping review is more common (and was at the time Paper 1 was published). Nevertheless, application of this terms varies as to whether systematic is a definitive aspect of a scoping review, or defines one of several approaches to scoping reviews. In studying terminology (among other characteristics), Tricco et al. (2016) found scoping review is the most common term (73.5%), followed by scoping study (10.5%), then systematic scoping review (3.6%). Unfortunately, Tricco et al.’s review does not consider that the use of multiple terms is intended to reflect the multiple methods and approaches of scoping reviews. This is illustrated when referring to Peters et al.’s (2015) Guidance for Systematic Scoping Reviews, as “methodological guidance on scoping reviews” (emphasis added). It would seem that they are assuming that the authors were not purposeful in their selection of title. The renaming implies systematic scoping reviews and scoping reviews are one and the same and that the terms can be used interchangeably; they are implicitly saying that all scoping reviews use systematic methods, regardless of fit for purpose. Paper 1 consciously and accurately named a systematic scoping review, to reflect the systematic nature of the methods given this was and is not a requirement for scoping reviews (Arksey & O’Malley, 2005; Levac et al., 2010).
Appendix D: Description of CoPEH-Canada

CoPEH-Canada is a network and community of scholars and practitioners from across Canada that was established in 2008 for the development and dissemination of ecohealth ideas and practices. An ecosystems approach to health (ecohealth) “recognizes that health and well-being are the result of complex and dynamic interactions between determinants, and between people, social and economic conditions, and ecosystems.” (Charron, 2012c, p. 7) Charon (Charron, 2012c) describes six principles of ecohealth. Three principles inform the practice (doing) of ecohealth: transdisciplinarity, systems thinking, and participation, and three principles inform the goals of ecohealth: sustainability, social and gender equity, and knowledge to action. Ecohealth is not defined by any one of these principles, as they are not unique to ecohealth, but uses these principles in applications of understanding, addressing problems and innovating.

CoPEH-Canada aims to advance the field of ecohealth and to address current challenges to a healthy and sustainable global future by supporting collaboration, research capacity building, education and knowledge translation. Originally funded by the International Development Research Centre (IDRC), they received continued funding from the Public Health Agency of Canada and other sources.

CoPEH-Canada is one of several networks and CoPs in ecohealth (Parkes et al., 2012). When emerging, field of ecohealth was characterized by dispersed international communities of researchers and practitioners interested in exchanging on the potential and challenges of addressing health and environment issues from a systems perspective; CoPs were seen as relevant to address this (De Plaen & Kilelu, 2004; Parkes et al., 2012). Other CoPEHs, like CoPEH-Canada were made possible through support from IDRC. Design phase consultations initiated by IDRC identified three core functions of any ecohealth network or community of practice: to create an ecohealth peer community, to develop research capacities in ecohealth, and to enhance the uptake of ecohealth research and its influence on policy and practice (Flynn-Dapaah, 2003; Parkes et al., 2012). While IDRC contributed to the original ideas of the CoPEHs, there is now a wide range of influences (Charron, 2012b). Mutual exchange and learning are not bound by the CoPEHs, and neither are the multiple dialogues that define the field (Charron, 2012b; De Plaen & Kilelu, 2004).
CoPEH-Canada is a group of individuals (with organizational and institutional connections) who are committed to the field of ecohealth. At the time of writing, there were over 300 participants in the member directory, and just fewer than 100 members defined as those that have consented to participate in studies about the community of practice. Membership included practitioners and policymakers, although mainly academics and trainees or alumni. CoPEH-Canada has a core of researchers with high levels of commitment to capacity building in ecosystem approaches, as well as peripheral members with varying levels of engagement. As CoPEH-Canada has been supported though grant-based funding, core members of the CoP tend to also be principal investigators. CoPEH-Canada has expanded over the years and includes many of the students who participated in the field course.

CoPEH-Canada is dispersed with a nodal structure. The three nodes are Western, Ontario and Québec-Acadie-Atlantique. Core members are located at nine Canadian universities in five provinces. Due to the geographical distance at which CoPEHs operate, they use both in-person and technology-mediated communications. The nodes build off existing capacities and have varying foci, (e.g., watershed management, zoonotic disease) as well as a combined focus ecohealth training and scholarship.

Ongoing activities include core team meetings, research and evaluation team meetings and, most visibly, an annual field school. The field school in ecosystems approaches to health is an 11-day course offered annually in different locations across Canada. The course is collectively designed and delivered by members of CoPEH-Canada and is a key activity around which the group coalesces. An explicit intention within this process was to strengthen individual and collective collaborative capacities as this was considered an integral part of understanding and implementing ecosystem approaches to health. The field courses employed lectures, demonstrations, group work, fieldtrips and discussions to promote learning (Parkes et al., 2017). Based on course sessions, CoPEH-Canada developed a publicly available teaching manual to facilitate ecohealth learning (McCullagh et al., 2012). CoPEH-Canada partnered with CoPEH-LAC in a 3-year grant to form the partnership EkoSanté (Saint-Charles et al., 2017).

Alumni members (those who participated as trainees in the field course) are engaged in a number of way included teaching sections of the field course and have also self-organized to develop their own initiatives. Leading up to the 2014 International Association of Ecology and Health
Conference in Montreal Canada, which CoPEH-Canada members played a major role in organizing, the term Emerging Scholars and Practitioners (ESaPs) was coined (Saint-Charles, Surette, Parkes, & Morrison, 2014) and is an inclusive term for early career people who incorporates ecosystems approaches to health in their work.

As core funding drew to an end, CoPEH-Canada engaged in sustainability planning and exploring new ways of community building. For example, the intensive field course was reformatted to a course using a cross-university hybrid course structure that includes both local field visits and technology-mediated connections across universities. CoPEH-Canada set up a memorandum of understanding with the universities of core members. With a small amount of funding CoPEH-Canada has prioritized funding a part-time coordinator. Additionally, members of CoPEH-Canada work together on a number of partnerships and grant outside the formal bounds of CoPEH-Canada.
Appendix E: Interview Consent Agreement

**Study Title:** Developing a theory-based evaluation framework for research-oriented communities of practice.

**Sub-study focus:** Exploring CoP resilience and sustainability through the application of an evaluation framework for extra-organizational CoPs.

You are being asked to participate in an interview lasting approximately one hour. Before you give your consent to participate, it is important that you read the following information and ask as many questions as necessary to be sure you understand what you will be asked to do.

**Investigator:** Kaileah McKellar, BSc, MPH, PhD (c) is currently a doctoral candidate at the University of Toronto, Institute of Health Policy, Management and Evaluation in the Dalla Lana School of Public Health. She is also a member of the Canadian Community of Practice in Ecosystem Approaches to Health –Canada. Her doctoral work is supervised by Rhonda Cockerill and Donald Cole.

**About the Study:** This study involves the application and refinement of an evaluation framework developed as part of the Investigators thesis. Results will relate to recommendations for future application and detailed insights on the functioning of an extra-organizational, research-oriented CoP, particularly with respect to resilience and sustainability of CoPs.

**Description of the Interview:** The interview questions will be semi-structured and open-ended. They will focus on your experiences as a member of CoPEH-Canada. They will ask you about the potential outcomes and important processes of the CoP. The interviews will be audio-recorded and transcribed.

**Benefits of the Study:** The primary benefit of this research is the advancement of knowledge on how processes and outcomes of communities of practice related to resilience and sustainability. While participants in the research process may experience certain benefits (such as enjoying an opportunity speak with someone about their experience in the communities of practice), this research does not guarantee any direct benefits to participants.

**Risks:** There are no known risks of this study.

**Confidentiality:** Sensitive data will be handled by anonymizing study participants and their home institutions. Data generated by this study will be stored on password-protected computers only accessible by the investigator or research team. Given that CoP members are part of the researcher’s committee, it may be possible for them to identify the opinion of their colleagues shared in the interviews. The investigator will retain the data for ten years after study completion, at which point it will be deleted permanently. Any hard copies of data will be kept in a locked office or cabinet.
**Incentives to Participate:** No incentive will be offered to participants. Existing personal/professional connection with the researcher may be an incentive for some interviewees.

**Voluntary Nature of Participation:** Participation in this study is voluntary. If you decide to participate, you are free to withdraw your consent and to stop your participation at any time. At any particular point in the study, you may refuse to answer any particular question or stop participation altogether, and you may withdraw your data from this study at any time. This study was approved by the University of Toronto Research Ethics board on May 9, 2016.

**Questions about the Study:** If you have any questions about the research now or in the future, please contact Kaileah McKellar at kaileah.mckellar@mail.utoronto.ca. If you have questions about your rights as a participant, you can contact the Officer of Research Ethics at ethics.review@utoronto.ca or 416-946-3273 at any time.

**Agreement:** Your signature below indicates that you have read the information in this agreement and have had a chance to ask any questions you have about the study. Your signature also indicates that you agree to be in the study and have been told that you can change your mind and withdraw your consent to participate at any time. You have been given a copy of this agreement. You have been told that by signing this consent agreement you are not giving up any of your legal rights.

Please indicate if you agree to participate in a recorded interview:  YES  or   NO

Can I contact you again to find out if you would be willing to do a follow up interview?  YES  or   NO

____________________________________
Name of Participant (please print)

____________________________________
Email address

____________________________________  __________________________
Signature of Participant                   Date

____________________________________  __________________________
Signature of Investigator                   Date
Appendix F: Semi-structured Interview Guide

I am working towards applying an evaluation framework as part of my dissertation work. The focus of this study will be to better understand how CoPs work with respect to resilience and sustainability. My purpose in talking with you today is to learn more about your thoughts, and experiences with CoPEH-Canada.

Anything you tell me will not be personally attributed to you in any reports from this study. Your participation in this interview is voluntary.

Introduction
1. To start, please tell me about yourself.
   a. [Probe option] What stage of your career are you at? Where do you work and/or study?
2. What sorts of work are you interested in pursuing in the future? [early career interviewees only]
   a. [Probe option: In the near-term]
   b. [Probe option: As broad career goals]

Participation
3. Please tell me a bit about your participation in CoPEH-Canada?
   a. [Probe option: How did you get involved? And when?]
   b. [Probe option: What motivated you to participate?]
   c. [Probe option: How has your involvement changed over the years?]
   d. [Probe option: Do you participate in “official” community wide events or activities]
4. What are the main issues that drive this work?
   a. [Probe option: What is the focus (domain) of this work?]
5. How you see your participation in CoPEH-Canada going forward? [Sometimes can be asked towards the end of the interview depending on flow]
   a. [Probe option: What would be an ideal form of participation with CoPEH-Canada]

Sense of Community
6. Do you feel a sense of community with the wider CoPEH-Canada?

Note that bolded questions represent the interview questions, non-bolded items are probes or questions that would be asked depending on the interviewer responses.
Individual Value (knowledge, practice, application, realized)

7. How has CoPEH-Canada influenced your career and your participation in academia?

8. What is the most satisfying part of your participation?

9. What do you get from your participation in the communities of practice? [Probe option: What benefits come from your participation?]
   a. In terms of learning and knowledge?
   b. Do you think there are have changes to your practice from participating in CoPEH-Canada?
   c. Can you point to any outcomes that may have resulted from your [or others] change in practice?
      a. Has it changed your networks, relationships with members, social rewards?
      b. Access to tools and resources?
      c. Recognition or reputation from participation?
      d. Learning energy? Approaches to learning?

10. Has COPEH-Can/your participation changed your goals?

11. How do you think you and your peers/colleagues have influenced the community of practice?

12. What has been your level of investment or the cost to you?
    a. How has this changed over your participation

Collective value

13. How do [they/we] bring about change [as a collective]?
    a. As a collective what impacts is CoPEH-Canada having?

14. Are you generating knowledge as a collective as part of your participation?

15. Would you consider COPEH to be a strong learning environment to bring about change? Why, why not, could you tell me about this?

16. What are the important ways in which CoPEH-Canada has transformed over the years?
    a. Has there been a change in what the success of CoPEH-Canada mean (has there been of reframing of what is the meaning of success for CoPEH-Canada or the Discourse on the value it creates)?
    b. [Probe option: How has leadership influenced the evolution of the CoP?]
    c. [Probe option: Are these changes strategic?]
Field
17. Has CoPEH-impact on the field Ecohealth? What impact/influence have they had?
   a. How have they been able to achieve this impact?

Organization (optional, depending on interviewee)
18. Has CoPEH-Canada brought value to your university/department/organization?
   a. Through your participation?
   b. Do they learn from the COP?
   c. Changes in learning practices, employees practices, organizational performance

Recommendations
19. How should CoPEH-Canada change?
   a. [Probe option: How do you think the CoPEH-Canada could be modified to better serve its members?]

20. What aspects would you like to see sustained (what should they CoPEH-Canada keep doing)?

21. What should CoPEH-Canada start doing?

22. What should COPEH-Canada stop doing

Mechanisms of sustainability and resilience
23. Do you think CoPEH-Canada will have a lasting impact? What lasting impact will the CoP have?

24. What do you think are the main contributing factors to its sustainability (Bertram, 2016).
   a. How has the group been sustained?
   b. [Alternate: What do you think are key factors in CoPEH-Canada’s resilience and sustainability]?
      i. [Probe/clarification: sustainability of the capacity built through CoP activities; sustainability of the CoP structure itself and being able to maintain action]
      ii. [Probe/clarification: resilience as in surviving threats; resilience as in moving forward, constantly learning adapting and reflecting]

CLOSING
25. Are there any comments or thoughts to add?
Appendix G: Revised Evaluation Framework

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<tr>
<th>Level of Analysis</th>
<th>Motivation and Participation</th>
<th>Relational</th>
<th>Knowledge</th>
<th>Learning and Identity</th>
<th>Intangible</th>
<th>Tangible</th>
<th>Applied</th>
<th>Realized</th>
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Levels of Analysis

Individual: This represents the value for individual members (people) of the CoP.

Collective: This represents the CoP as a whole or unit. There are both individual and collective manifestations in the motivations and processes of CoPs, therefore it follows that the outcomes of participation also occur at the individual and collective level. Early literature in CoPs promotes the collective as a unit of analysis, and Wenger (199*) specifies that joint enterprise is considered a collective product.

Organization: This represents the firms, institutes or organizations to which members of the CoPs belong (as employees or other affiliation). Some organizations may fund or support extra-organizational CoPs, other may have no direct involvement.

External Stakeholder: The level of external stakeholder is unique because it can represent individuals, organizations and/or target populations of the CoP. Stakeholders are actors (persons or organizations) with a vested interest, either in the effective operation of the CoP, their domain, their practice, or the value generated. The distinction here is that they are external to the CoP.

Field: The field is related to the subject, issue or topic in which members share an interest or passion. The field is comprised of both codified knowledge, emergent knowledge and represented in the ongoing work of researchers and practitioners active in the field, and tacit knowledge held by individual researchers and practitioners. The field is related to the concept of domain for a community of practice, where the latter is subsumed within the former. It can be similar to profession.

Types of Value

Motivation and Participation: This refers to the motivational responses as a consequence of engaging with the CoP. These can be goals and aspirations, or positive feelings from participation as well as sources of motivation to participate.

Relational: This includes structural (e.g., connections, meeting a person) and relational aspects (e.g., quality of relationships, trust).

Knowledge: This includes knowledge and skill regarding the domain and practice. It can be both tacit and explicit knowledge. This is related to shared meaning and understanding that individuals or groups have with one another.

Learning and Identity: The learning aspect of this value is process-oriented (including reflective processes) and relates to learning how to learn and work collaboratively. It also includes changes in identity that result through negotiated meaning with the CoP.

Intangible: This refers to intangible assets that are not elsewhere captured. Examples include status of an individual, the reputation of the CoP, its collective voice or the salience of the domain.

Tangible: Tangible assets are similar to the shared repertoire of the CoP. These can include documents, tools, procedures and methods.

Applied: This represents changes in practice that comes from the application of the above listed types of value.

Realized: These are the results of the CoP and, in particular of applied value or behaviour change. This represents value that is more traditionally considered outcomes in evaluation.

Reframing and Transformative: The reconsideration of learning imperatives a result of the learning itself, a redefinition of success or a fundamental change