Sustainability Managers: The Job Roles and Competencies of Building Sustainable Cities and Communities

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Sustainable development, defined by the World Commission on Environment and Development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 43), has helped shape local public policy for the last three decades (Wang, Van Wart, & Lebredo, 2014; Xavier, Jacobi, & Turra, 2019). Local Agenda 21 (LA21) and the Global Covenant of Mayors for Climate and Energy (GCoM) are two international policy responses to sustainable development at the local level. LA21 galvanized thousands of local governments worldwide to develop sustainability plans (Rok & Kuhn, 2012; Saha, 2009). Similarly, the GCoM inspired more than 9000 local governments to demonstrate leadership on climate protection by creating Climate Action Plans (Sharp, Daley, & Lynch, 2011). Although sustainability and climate action plans[1] are collaboratively developed and implemented with a range of local stakeholders, one critical actor is often hired by the local government who is responsible for fulfilling the municipality's commitments to developing and advancing the plan: the sustainability professional.

Despite the importance of local governments for advancing sustainability interventions in communities and cities (Zeemering, 2018), little is known about the qualifications, job responsibilities, or competencies of the sustainability professionals responsible for the strategic management of these plans (Wang et al., 2014). Indeed, almost no research has been conducted to understand the diversity of emerging jobs in the sustainability field (Egri & Herman, 2000; Salgado, Abbott, & Wilson, 2018). Likewise, few studies on sustainability competencies are positioned outside of the education literature (Bruyere, 2015; Salgado et al., 2018). Rather, the focus of most competency studies has remained tied to student outcomes for the purpose of

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[1] Note: The term sustainability plan(s) will be used as a generic term to denote both LA21 Sustainability Plans (and their equivalent plans) and Climate Action Plans throughout the remainder of the article.

curriculum development (Barth, Godemann, Rieckmann, & Stoltenberg, 2007; Rieckmann, 2012; Wiek, Withycombe, & Redman, 2011), therefore offering limited insight on the experiences and competencies of working sustainability professionals. This article seeks to illuminate this undeveloped research topic, and thus contribute to the public performance literature, by shedding light on the people who have direct experience with sustainability in a managerial capacity. Specifically, the findings of this study improve understanding of municipal sustainability managers[2] by questioning *who* these individuals are, *what* they do in their job, and *how* they perform their job.

This article begins with a review of literature that contextualizes our guiding research questions, organized across two distinct sections: (1) sustainability management in local governments targeting *what* sustainability managers do, and (2) sustainability competencies targeting *how* they do it. We then outline the methods used for interviewee selection, data collection, and data analysis. Following the presentation of our results, we discuss our findings in the context of the sustainability manager's job, providing new insights on a job position that is important to public performance. We then discuss sustainability management competencies, considering the implications of our findings in light of other reported competency research and the public administration literature. We conclude by outlining the limitations of our study as well as offering avenues for future research.

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[2] All interviewees needed to be the primary manager or individual employed by the municipality to implement the local government's sustainability plan. Thus, our sample included a variety of job titles. For the purposes of clarity and continuity, we employ the title 'sustainability manager' to encompass the various job titles found in our sample.

Literature Review

Sustainability Management in Local Governments

The widespread adoption of initiatives such as LA21 and GCoM indicates an increasing proclivity among local governments to prioritize sustainable development (Saha, 2009; Sharp et al., 2011), exemplifying their leadership in advancing sustainability (Portney, 2013; Rok & Kuhn, 2012). The current research on sustainability in the public administration literature has focused on three areas: (1) understanding local sustainability practices (Greco, Sciulli, & D'onza, 2012; Montesinos & Brusca, 2009), (2) identifying local government motives to pursue sustainability (Leuenberger, 2006), and (3) examining new governance arrangements that form to manage local sustainability initiatives (A. MacDonald, Clarke, Huang, Roseland, & Seitanidi, 2018; Portney, 2005; Worthington, Patton, & Lindley, 2003). While this research has undoubtedly demonstrated the importance of sustainability to public performance and management, there is a critical research gap regarding "how sustainability efforts are managed in local government" (Zeemering, 2018, p. 141), and by extension, the role of public managers in sustainability efforts. In order to anticipate the feasible work activities of a municipal sustainability manager, this section describes some of the essential management tools, strategies, and processes that local governments adopt to reach their sustainability goals.

The limited studies targeting the aforementioned research gap have uncovered fertile ground for future research as their findings point to the importance of aligning the theoretical insights of public management with sustainability in a local context (Enticott & Walker, 2008; Svara, Watt, & Jang, 2013; Zeemering, 2018). A study by Wang, Hawkins, Lebredo and Berman (2012) provides an excellent entry point to elucidate this connection as they identify the critical role of managerial capacity for establishing, prioritizing, and institutionalizing sustainability.

Defining managerial capacity as "an organization's ability to develop sustainability goals and principles, incorporate those goals and principles into the strategic planning process and operations, and monitor and assess the achievement of those goals" (pp. 843), Wang et al. (2012) identifies key indicators of managerial capacity for sustainability implementation. Of these indicators, the one that emerges as the most significant for institutionalizing sustainability is likewise the most pertinent to our research focus on municipal sustainability managers: namely, the creation of a designated job position or office to manage local government sustainability initiatives (Wang et al., 2012).

The prevalence of sustainability-related jobs in local governments is a relatively new development. Nonetheless, research indicates that this recent uptake will continue to climb as governments prioritize and institutionalize sustainability. A survey of 264 U.S. cities shows that 37.9% of the cities surveyed have a designated office to coordinate sustainability initiatives (Wang et al., 2014). This finding verifies the existence of these positions and substantiates a prevalence of designated sustainability jobs in municipal organizations. Yet, there is a paucity of research on sustainability professionals in general (Salgado et al., 2018), and to our knowledge, there is effectively no research examining the role of designated sustainability jobs in the public sector (Tsai, Stritch, & Christensen, 2016). This remains true for the most foundational of information, as extant research provides little clarity on who fills these positions (i.e., the qualifications of these professionals), what their job entails, and how they perform their job (Egri & Herman, 2000; Wang et al., 2014; Zeemering, 2018). In response, our study reviews related research on management practices for developing and implementing a sustainability plan, positioning our study with a clearer direction towards examining the job of sustainability managers in the public sector (Wang et al., 2012).

The literature surrounding municipal sustainability plans offers valuable insights for anticipating the work activities of sustainability managers. This research demonstrates that guiding frameworks, such as LA21 that orient the formulation and implementation of municipal sustainability plans are modelled after well-developed collaborative strategic management practices (Clarke & Fuller, 2010). For example, a dominant managerial approach for municipal sustainability plans is strategic planning, suggesting that the sustainability manager job might involve developing their community or corporate sustainability vision, as well as the accompanying goals, targets, and action plans (Xavier et al., 2019). Similarly, the implementation of these plans depends on the development of strategic management processes that provide ongoing oversight, monitoring, and evaluation of plan activities and progress (Clarke, 2011; A. MacDonald, Clarke, & Huang, 2019). This anticipates that a sustainability manager job might entail typical strategic management practices, such as monitoring and evaluating the plan's progress as well as facilitating periodic updates to the plan's goals, targets, and strategies (Poister & Streib, 1999). Furthermore, a fundamental principle of sustainable development that underpins the aforementioned strategic management activities is that transformation must be achieved through "democratic dialogue and decision-making" (Calder & Beckie, 2013, p. 148). Accordingly, it is expected that sustainability managers will participate in ongoing collaboration practices that engage both citizens and other community stakeholders throughout the sustainability plan's formulation and implementation (Kalesnikaite, 2019).

In Canada, national programs such as The New Deal for Cities and Communities and Partners for Climate Protection (PCP) provide local governments with the impetus and guidance to develop their managerial capacity for sustainability. These programs support the development of two types of municipal sustainability plans: Integrated Community Sustainability Plans

(ICSPs) and Climate Action Plans, respectively. Entry into these programs requires that municipalities choose to create an ICSP or Climate Action Plan for either the corporate or community-wide level. Alternatively, municipalities can develop both plans for both levels. Corporate plans tackle topics and areas that are within the direct control of local governments, such as land-use planning, the greening of transportation, and updating public infrastructure (Clarke & Ordonez-Ponce, 2017). In contrast, community-wide plans address sustainability issues on a community scale with interventions for individual community members, local organizations, or a region (Clarke & Ordonez-Ponce, 2017). Examples of community-wide interventions include programs that work with community members to reduce their ecological footprint or incentivize local businesses to decrease their greenhouse gas emissions. Ultimately, these national programs inform how municipalities enact their sustainability plans and, in turn, help our study anticipate how sustainability managers might enact their job responsibilities.

This study focuses on public managers whose main job responsibility is to manage a municipal sustainability plan for three central reasons. First, due to the promotion of international programs such as LA21 and the GCoM, sustainability plans have been adopted by municipalities worldwide (ICLEI Canada & FCM, n.d.; Mazzara, Sangiorgi, & Siboni, 2010). Therefore, it is conceivable that the job responsibilities of many municipal sustainability managers are tied to developing and implementing municipal sustainability plans. Second, the extant literature on municipal sustainability plans is well developed, offering detailed descriptions of how local governments carry out these plans (Clarke, 2011; Clarke & Fuller, 2010). This information provides valuable insight into the types of work activities that municipal sustainability managers may enact in their job. Third, these plans include established benchmarks indicating plan progress, therefore providing a central anchor for our selection criteria as each

interviewee's respective plan was required to have achieved a certain level of performance (ICLEI Canada & FCM, 2008). These benchmarks enable the identification of incumbents who have demonstrated job performance, thus designating them as credible sources for identifying sustainability management competencies (Spencer & Spencer, 1993).

Sustainability Competencies

This study reviews the literature focused on the concept of 'competencies' in the practice of sustainability. We recognize the evident interpretability issues surrounding competency research, where unclear terminology has promoted a diversity of opinions on best practices for defining, measuring, and assessing competencies (Besong & Holland, 2015; Getha-Taylor, 2008; Salgado et al., 2018; Spencer & Spencer, 1993). However, this article does not attempt to engage with these broader theoretical and methodological debates, instead focusing on understanding competencies as they relate to performance in the sustainability field, and more specifically in sustainability management work. Thus, our review primarily focuses on studies that specifically examine sustainability competencies.

Most definitions of competence or competency in the sustainability literature reference characteristics such as knowledge, skills, and abilities (Martin, 2008; I. Thomas, Barth, & Day, 2013) as well as values and attitudes (Besong & Holland, 2015; Cohen, Wiek, Kay, & Harlow, 2015) that may enable task performance with respect to addressing sustainability challenges or implementing sustainability initiatives. Further distinctions are made between 'competencies' and 'key competencies' (Barth et al., 2007; Wiek et al., 2011), where 'competencies' retain the above-mentioned characterization and 'key competencies' represent a grouping of competencies that are required to perform a specific task (Wiek et al., 2011). Our study operates under the definition of sustainability competencies provided by Wiek et al. (2011) as "the knowledge,

skills, and attitudes that enable successful task performance and problem solving with respect to real-world sustainability problems, challenges, and opportunities" (p. 204).

Studies in higher education have significantly contributed to furthering the conceptualization of sustainability competencies by broadly identifying lists of competencies that are associated with the sustainability profession (Silvius & Schipper, 2014; Wiek et al., 2011). Among the most commonly cited are change management (Martin, 2008; Rowe, 2007; Svanström, Lozano-García, & Rowe, 2008), anticipatory thinking, systems thinking (Hurlimann, 2009; Rieckmann, 2012; Willard et al., 2010), collaboration and interpersonal competence (Crofton, 2000; Willard et al., 2010). Knowledge of sustainable development principles as well as valuing diversity, the environment, and social inclusion are also noted sustainability competencies (de Haan, 2006; Sterling & Thomas, 2006).

Although identification, compilation, and value-ranking are important contributions in the conceptualization of sustainability competencies, the applied criteria are often obscure, producing 'laundry lists' that insufficiently address how individual competencies are interconnected (Wiek et al., 2011). Some respond to this difficulty through a process of clustering, where competencies are unified in a comprehensive framework. These frameworks can improve the rigour and depth of competency research by producing more transparent criteria and shared understanding among researchers. Moreover, the succinct nature of these frameworks provides an opportunity for more detailed elaboration that an expanding catalogue of competencies cannot accommodate, thus allowing researchers to more easily interrogate existing competencies (Getha-Taylor, 2008). For example, Wiek et al. (2011) cluster competencies by conceptual similarity to generate a framework consisting of five key sustainability competencies for research and problem-solving: systems thinking, anticipatory, normative, strategic, and

interpersonal competence. Other studies have developed or applied comparable frameworks when discussing sustainability competencies, such as the Gestaltungskompetenz framework (de Haan, 2006) and the transformative sustainability learning framework (TSL framework) (Sipos, Battisti, & Grimm, 2008).

Comparisons can be drawn between the above-mentioned frameworks, emphasizing their ability to recover continuity from the terminological uncertainty of competency research. Consider the overlapping sense that specific competencies share across these frameworks, such as anticipatory competence (Wiek et al., 2011) and foresighted thinking (de Haan, 2006), or interdisciplinary work (de Haan, 2006) and transdisciplinary thinking (Sipos et al., 2008). While certain competencies, such as systems thinking, have directly comparable terminology across all three frameworks (de Haan, 2006; Sipos et al., 2008; Wiek et al., 2011). Ultimately, conceptualizing frameworks help to elucidate the interdependent functioning of competencies when addressing the complexities of achieving sustainability outcomes.

Sustainability Competencies in Practice

As sustainability continues to be a global priority, there is an increasing demand for expertise in this emerging and vast field (Lacy, Cooper, Hayward, & Neuberger, 2010). In response, researchers have sought to examine sustainability competencies by collecting data on different practitioner groups (Hurlimann, 2009; L. MacDonald & Shriberg, 2016; Quinn & Dalton, 2009; I. Thomas et al., 2013). For example, in a study of fifty planning practitioners, Hurlimann (2009) examines the perceived gaps in the environmental education of planners, identifying a need to further develop both critical thinking and independent inquiry. Similarly, L. MacDonald and Shriberg (2016) examine the effectiveness of sustainability leadership programs from the perspective of alumni, finding gaps between program outcomes and workplace requirements,

indicating that sustainability programs should place more emphasis on developing student skills, such as public speaking, coalition building, and negotiation (L. MacDonald & Shriberg, 2016).

Whereas the above-mentioned studies examine the sustainability competencies of professionals whose job tasks include sustainability, among many other pertinent considerations, Bruyere (2015) offers one of the few studies to examine professionals whose central job responsibilities are directly tied to environmental sustainability. The results conclude that adaptive management is essential for practitioners navigating the uncertainties of sustainability, finding that partnership-building, establishing a vision, conflict management, and strategic planning were among the most important skills for conservation leadership. Moreover, Salgado et al. (2018) identified relevant competencies associated with implementing sustainability interventions, such as political-strategic thinking, navigating complexity, and facilitating collaboration; ultimately emphasizing the interrelated, mutually reinforcing nature of the competency cluster (Salgado, et al., 2018). Nevertheless, sustainability professionals consult on an array of topics, ranging from business strategy to public policy (Salgado, et al., 2018). Indeed, the profession encompasses a variety of roles within an organizational hierarchy, including senior leaders, managers, policy analysts, program coordinators, educators, and researchers (Lacy et al., 2010; Rieckmann, 2012; Salgado et al., 2018). As society and organizations continue to prioritize sustainability concerns, an increasing number of jobs will involve sustainability related work requirements, thus expanding the relevance of sustainability management competencies to a broad array of jobs both within and outside the sustainability profession (Lacy et al., 2010).

Methods

This study used a qualitative research design (Braun & Clarke, 2006). The data were collected by

interviewing sustainability professionals employed by Canadian municipalities.

Interviewee Selection

All interviewees needed to be the primary manager or individual employed by the municipality responsible for implementing the local government's sustainability plan. Informed by the expert panel method, this selection criterion expected that key decision-makers understood the competencies required to implement a successful sustainability plan from both a managerial and practical perspective (Spencer & Spencer, 1993).

This study considered the two leading types of municipal sustainability plans in Canada: ICSPs and Climate Action Plans (Clarke, 2012). ICSPs, the Canadian equivalent of LA21 plans, are long-term, locally made plans that commit municipalities to integrating sustainable development into their agendas (Association of Municipalities of Ontario, 2007). Climate Action Plans are a product of the PCP program, launched in 1994 by ICLEI - Local Governments for Sustainability and the Federation of Canadian Municipalities (FCM). This program provides a five-milestone framework that supports municipalities with the design, implementation, and evaluation of their Climate Action Plan (ICLEI Canada & FCM, 2008).

To ensure the selected interviewees had a successful performance history, the implementation of their sustainability plan needed to have achieved specific performance thresholds. The Climate Action Plan had to have reached the PCP program's Milestone 4 or 5 and the ICSP had to have a sustainability progress report. The PCP Milestones are measures of progress on plan implementation. Milestone 4 is achieved when the municipality or community is implementing the local action plan. Milestone 5 is reached when progress on plan implementation is monitored and results are reported (ICLEI Canada & FCM, n.d.).

Eighty individuals from English-speaking Canadian local governments met the selection criteria, each receiving a personalized invitation to participate in the study. Of the eighty individuals contacted, twenty-six agreed to participate. The interviewees represented the implementation of twenty-six different plans from twenty-five different municipalities across Canada. As categorized by Statistics Canada (2016), one interviewee was from a very small-sized (rural area) municipality (population of 999 or less), two interviewees were from small-sized municipalities (population of 1,000 – 29,999), seven were from medium-sized municipalities (population of 30,000 – 99,999), and sixteen were from large-sized municipalities (population of 100,000 or more).

Data Collection

The data were collected using semi-structured interviews (Marshall, 1996) conducted either in-person or via telephone/Skype. Interviews lasted 45-60 minutes and were recorded to be subsequently transcribed for analysis.

The interview was organized into three parts. Part one was comprised of interview questions that collected information about the interviewees' education and training as well as total work experience in the sustainability field (*who* sustainability managers are). Part two questions asked interviewees to describe their current job responsibilities and activities with specific attention given to understanding their role in the sustainability plans' implementation process (*what* sustainability managers do). For example, interviewees were asked questions such as: '*Please briefly describe the [name of sustainability plan] and its implementation process*,' '*what is your role in implementing [name of sustainability plan]*,' and '*please describe your job responsibilities and tasks in your current position.*' Part three contained interview questions designed to gain insight into the competencies that sustainability professionals consider valuable

to performing their job as well as working in the broader sustainability field (*how* sustainability managers do their job). This part of the interview involved probing questions that oriented participations towards providing detailed explanations and examples for each competency that they identified as valuable.

Data Analysis

Part one of the interview uncovered the education and work experience of the interviewees. Where possible, these data were cross-referenced against the interviewee's LinkedIn page or online CV as the information was lifted from the transcripts. Specifically, these data elucidated for each interviewee their years of sustainability work experience, academic degrees, as well as the title, focus, and scope of their current role.

Part two of the interview asked participants to describe the job responsibilities and work activities of their current job. This information was inductively coded by two coders independently (D. R. Thomas, 2006). To increase the coding accuracy, the transcripts were read multiple times to identify the tasks and responsibilities that emerged during the interviews (Jain & Ogden, 1999). Initially, three transcripts were coded, compared, and discussed to create a common coding tree (Braun & Clarke, 2006). After all the transcripts were coded, the results were again compared and discussed until agreement was reached (Braun & Clarke, 2006). Ultimately, this process of analysis generated a table of the roles, job responsibilities, and work activities of sustainability managers (Sanchez & Levine, 2012).

The final part of the interview asked participants about the competencies that are valuable for their job as a sustainability manager. The data on competencies were deductively coded (Braun & Clarke, 2006) by two coders independently based on the literature review, followed by a stage of inductive coding to determine new insights (D. R. Thomas, 2006). The transcripts

were compared at two points in the coding process and resulted in a table of the competencies required to successfully occupy a sustainability manager's role. Inter-rater reliability was assessed with Cohen's kappa; the raters showed good inter-rater reliability (.67 < k < .80) (Carletta, 1996).

Where possible, a competency dictionary was used to refine the conceptualization and terminology assigned to specific competences in our coding tree. For example, the literature review of sustainability competencies surfaced the code 'interpersonal' competence defined as "the ability to motivate, enable, and facilitate collaborative and participatory sustainability" problem-solving and action (Wiek et al., 2011, p. 9). In adopting this definition the conceptualization of the interpersonal code is further refined in light of Spencer and Spencer's (1993) behavioral indicators for 'listening and responding to others.' Moreover, a competency dictionary was used throughout the inductive coding process as behavioral themes began to emerge in the data. For example, the conceptualization and coding of 'information seeking,' which surfaced as a theme in the data, was refined using Spencer and Spencer's (1993) competency dictionary, which contained a definition and behavioral cues for 'information seeking' (i.e., 'does research' or 'contacts others').

All direct quotations from interviewees are anonymized by means of participant identification codes, presented as 'job title (size of the municipality as defined by Statistics Canada),' to protect organization and personal identity.

Results

Qualifications of Municipal Sustainability Managers

Overall, the interviewees have significant work experience in the sustainability field, with the

majority having more than ten years in the field. Moreover, nearly every interviewee has experience working in the sustainability field before entering their current sustainability position, with participants having an average of 7.96 years of prior work experience. Table 1 summarizes interviewees' total and prior years of work experience in the sustainability field and years in their current role.

Table 1. Work Experience of Interviewees

	Years in sustainability field (# of interviewees)	Years in sustainability field prior to current role (# of interviewees)	Years in current role (# of interviewees)
Less than 1 year	–	1	1
1-4 years	–	9	10
5-9 years	10	8	10
10-14 years	5	2	3
15+	11	6	2

Nearly all interviewees hold a bachelor's degree and over half also earned a master's degree. Twenty interviewees have an academic major in at least one of the following disciplines: business/management/public administration, planning/community development, or environmental sciences/studies. Eight interviewees hold a degree in environmental sciences/studies combined with another degree in either business/management/public administration or planning/community development. These findings, summarized in Table 2, show that administrative skills and sustainability knowledge are common qualifications of sustainability professionals.

Table 2. Education and Training of Interviewees

Level of Education	Number of interviewees
Certificate / Diploma	8
Bachelors[1]	25
Masters[2]	15

Unknown	1

Disciplines[3]

Business / Management / Public Administration	10
Planning / Community Development	9
Environmental / Earth Sciences / Resource / Energy Management	9
Engineering	8
Environmental / Sustainability Studies	5
Other (Arts and Science)	9

[1] two people have two Bachelor's degrees; almost all interviewees have a Bachelor's degree – only two do not (and one is unknown)
[2] two people have two Master's degrees
[3] one person has a double major (so coded as two disciplines)

All interviewees have managerial or strategic planning responsibilities, with nineteen in senior management roles. Most interviewees are responsible for corporate and community-wide plan implementation and many conceptualize these two plans as highly interdependent. Table 3 outlines the interviewees' job title, focus, and scope (i.e., the type of plan they implement).

Table 3. Job Title, Focus, and Scope

		Number of interviewees
Job title	Chief Administrative Officer (CAO)	2
	Manager / Director	17
	Coordinator / Planner / Specialist / Officer	7
Job focus	Oversees entire local government	2
	Sustainability / Environment	12
	Energy / Climate / Air Quality / Transit / Waste	8
	Economic Development / Planner	3
	Community Initiatives	1
Job scope (type of plan)	Corporate (local government)	5
	Community-wide	5
	Both corporate and community-wide	16
The word sustainability, sustainable, climate or environment in job title (not including Air, Waste, Energy, etc.)		18

Roles, Job Responsibilities, and Work Activities of Municipal Sustainability Managers

Interviewees' characterize twelve types of work activities when questioned about their job responsibilities. We arranged these into four role categories based on their functional fulfilment of an overarching job responsibility (see Table 4). For example, the activity of strategic planning is discussed as a means to identify and select sustainability interventions with higher probabilities of approval from decision-makers and the public. Thus, we group this job responsibility and its associated activities into the role theme Strategist. For example, Director 4 (large municipality) describes enacting the Strategist role:

> My position requires me more to set the strategic direction of where we're going. We have a work plan that we take to our [city] council every year, but it is a five-year work plan, where we're going over the next five years.

These four job roles should not be conceptualized as mutually exclusive. For example, in performing the roles of the strategist and facilitator, many interviewees concurrently enact the role of collaborator as collaboration is often part of formulating and implementing sustainability interventions. For example, Manager 7 (large municipality) explains how Collaborator work activities (i.e., team management) contribute to Facilitator job responsibilities (i.e., implement an energy efficiency program):

> … we formed a team and we met on a monthly basis to, like did a walkthrough audit of the facilities, went to a couple of high energy consuming facilities, did a quick like visit of those facilities to identify such opportunities. And then for those that we [did] as a team, we estimated a savings and then we did the technical evaluation in terms of whether those emissions were valuable, whether it was worth implementing.

Table 4. Roles, Job Responsibilities, and Work Activities

Role	Job responsibilities	Work activities	Number of interviewees that mentioned
Strategist	Identify and select strategic sustainability intervention(s)	Plan formulation (creating a sustainability vision, setting goals, formulating action plans, and identifying performance measures)	22
		Strategic planning (setting the strategic direction, selecting strategic sustainability interventions, and fine-tuning action plans)	15
Change Agent	Gain initial and ongoing approval, support, and buy-in for intervention(s)	Education and consultation (internal and external)	15
		Advocacy and promotion (internal and external)	14
		Monitoring and reporting progress on sustainability intervention(s)	9
Collaborator	Involve stakeholders in formulating /implementing intervention(s)	Partnership management (community)	20
		Team management (corporate)	14
Facilitator	Implement intervention(s)	Project management (budgeting, creating and managing timelines, and staffing)	25
		Capacity building	13
		Fundraising (searching and applying for grants)	6
		Organizing and running meetings (agenda setting, chairing, supplying information materials)	6
		Planning and facilitating events	3

Competencies Linked to Sustainability Management Behavior

Our thematic analysis identifies eleven sustainability management competencies as explained by interviewees. Table 5 presents: a summary of the competency themes, a list of the associated behavioral indicators, the number of interviewees that mention each theme, and the results of the coder inter-rater reliability tests.

Communication

A competency in communication requires adopting language that is mutually understood by stakeholders while retaining the resonance needed to influence stakeholders towards a desired sustainability outcome. Many respondents emphasize the importance of adapting their messages to speak with greater affect, such as Director 1 (large municipality), who states:

> … sustainability [work] does require a multi-disciplinary team and so language means different things to different people. So, it's really being very attuned to whether people are actually understanding the words that are being used to describe the work that we're doing and the outcomes we're striving for.

Interviewees also confer the need to use 'common language' when speaking about sustainability to the public and city council. For example, Manager 5 (large municipality) suggests:

> … people skills are things that need to be developed more. So it's—one—to know why sustainability is important and what the benefits are, but it's also important to know how to explain that to others; to make others understand why it's beneficial and, we don't, I think, help people enough; like sustainability people. Often they talk to others who already understand all that, and it's a communication skill—speaking to decision-makers, like elected officials and the public.

Table 5. Competencies Linked to Sustainability Management Behaviors

Competencies	Behavioral indicators	Cohen's Kappa	Number of interviewees that mentioned
Communication	–adapts message to different stakeholder audiences –uses common language to speak about sustainability with elected officials and the public –speaks with confidence about sustainability interventions	0.706	22
Change management	–communicates positive aspects of proposed change to influence stakeholder perceptions –explains importance and relevance of proposed change to stakeholders –adjusts plans to accommodate diverse needs of different stakeholders –adapts plans to respond to changing situational factors *see also communication and interpersonal competencies*	0.705	21
Multi-disciplinary collaboration for intervention formulation and implementation	*Formulation stage* –includes stakeholders early in the formulation process –collects stakeholder feedback –listens to and addresses stakeholder concerns –incorporates stakeholder feedback into the design of the intervention *Implementation stage* –convenes stakeholders with key expertise, experience, or other resources –mentors and builds collaborator capacity –guides discussions toward common goals –facilitates conflict resolution –maintains collaborator engagement –shares information and other resources freely	0.884	20
Interpersonal	–listens to understand the diverse perspectives and needs of different stakeholders –incorporates stakeholder ideas and perspectives into decision making and actions	0.719	19

	–builds relationships with colleagues, community members, elected officials, and partners		
Sustainability knowledge	–possesses solid knowledge of sustainability principles and issues –has general knowledge across multiple sustainability-related areas	0.752	19
Strategic thinking	–cultivates clarity of purpose/vision –sets strategic priorities based on long-term vision –aligns plan goals with city needs	0.834	16
Information seeking	–attends sustainability training and courses on an ongoing basis –seeks out examples of and information on best practices in sustainability –stays current on evolving approaches and technologies in the sustainability field	0.757	12
Project management	–budgets and allocates resources to intervention implementation –schedules activities in a logical sequence for intervention implementation –ensures adherence to implementation deadlines –delegates implementation tasks and responsibilities to ensure timely goal achievement	0.688	10
Future-oriented thinking	–imagines future scenarios –connects today's actions with prospects for a sustainable future –understands link between long-term planning and sustainability	0.833	10
Sustainability values	–demonstrates commitment to sustainability through personal actions –expresses care and concern for the wellbeing (social, environmental, and economic) of their community –possesses a passion for environmental protection	0.896	7
Systems thinking	–possesses knowledge of different component parts of system –understands interconnections among system parts to anticipate cause and effect interactions	0.719	7

Whether focusing on corporate or community-wide sustainability plans, interviewees emphasize the need for communication competency in order to successfully navigate the immensely interpersonal nature of achieving their plan's sustainability goals.

Change management

Change management competency is a complex combination of behaviors enacted while navigating the barriers that emerge when sustainability intervention require actors to change. For example, Manager 9 (large municipality) describes the importance of communication and empathy when exercising change management:

> Change management…I would add that on as something that I think is important, because ultimately, that's often what we're trying to do or asking people to change, or organizations to change, or communities to change in some way. And so we need to know how to communicate that, how to spin it positively, and how to just understand that change is hard for people and how to kind of work through that, the behavioral side of that.

Manager 1 (large municipality) notes the importance of finding ways to gain stakeholder involvement during the change process and reflects on how their past work experience has contributed to their competency in this area:

> I worked in Management Consulting for ten years and I think that the main things that I learned from that—that I've taken away and apply in my work now—are how to bring about change in a very large organization and how to get things done when you're not in charge. So, how to convince people of the merits in a particular position and how to convince them that their involvement is going to be beneficial to them. And that it is important.

Whereas Coordinator 1 (large municipality) provides specific examples of the change

management behaviors that they have enacted in their current role:

> … when we were developing the community energy plan I wanted a much more
> aspirational carbon target, but at the time I didn't have support for it. So it was
> compromising in having a smaller, less ambitious target in the plan. Having said that,
> as I explained, nothing like a severe weather event to get people to wake up and
> realize climate change is happening. And so [city] council, not in the community
> energy plan, but in council's [the corporate sustainability plan] strategic plan, put a
> more aspirational carbon reduction target in their plan.

Multi-disciplinary collaboration

Our multi-disciplinary collaboration code captures intra-organizational collaboration through

cross-functional teams and inter-organizational collaboration through cross-sector or multi-

stakeholder partnerships. In our first round of coding, we coded intra- and inter-organizational

collaboration separately. However, further analysis revealed that the type of collaboration (i.e.,

intra-versus inter-organization) has less of an impact on collaborative behaviors than

distinguishing between different stages in the process of executing an intervention (i.e.,

formulation versus implementation). Therefore, this theme organizes multi-disciplinary

collaboration behaviors into two sub-themes: formulation and implementation, where

formulation is identifying, prioritizing, and planning what interventions are required and

implementation is the action-based steps taken to actualize the previously formulated

interventions. Nearly all interviewees mention multi-disciplinary collaboration competency as

necessary to implementing municipal sustainability plans.

Collaboration behaviors for intervention formulation.

In formulating sustainability interventions, participants explain the importance of collaborating with individuals or groups that could be affected by, or opposed to, a proposed intervention. Interviewees' emphasize behaviors that would engage stakeholders early in the formulation process in order to solicit feedback that surfaces concerns that can be incorporated into the design of the intervention. Manager 3's (large municipality) specific example illustrates behaviors that indicate competence in collaborative intervention formulation:

> … we had heard that there was a lot of discontent from the pilot, particularly in our finance group and in our legal group because there were things that caused them great grief in the way it was structured. So we set up that kind of multi-stakeholder meeting where it was really 'we're not telling you how we're doing it, we want to work with you to develop how we should best do it' and to kind of like make them feel at ease, like, where this is going to be a different program with a different approach if their opinions are going to be incorporated so that it was easier for them because of the fact that they're there to get work, right? Something like that, where you can kind of, 'okay I know that there are these issues, I have to launch this program anyways, I'm not just going to pop down launch it'. You know, I want to get the buy-in from all the people so that it can run as smoothly as possible.

Collaboration behaviors for intervention implementation.

Collaborative processes while implementing sustainability interventions is emphasized by interviewees as a means to build stakeholder ownership over interventions. According to CAO 2 (very-small municipality):

> … if the community and the people that you need to do the work—because you can't do all the work—don't feel as if this is theirs and they got their flesh in there too and they feel like this is their project, then they're not going work and help. So you have

to allow that, you have to allow them to be doing what makes that volunteer engaged, so you can't take that away from them.

Moreover, enabling stakeholders to implement interventions allows for faster progress. Interviewees explain that adopting behaviors that facilitate freer information and resource sharing enable stakeholders to leverage previous expertise and experience. This capacity building is frequently cited by interviewees as increasing the plans' impact on sustainability. In the words of Coordinator 1 (large municipality), there is value in

… being able to share and work on teams because you can't do it on your own, right, there's a lot of team effort in what we do and sharing information, building networks.

Other collaborative behaviors while implementing sustainability interventions include guiding discussions towards common goals and facilitating conflict resolution. As Manager 9 (large municipality) elaborates:

…if I tie it back to the partnership development idea, I guess, setting up meetings and facilitating them in a way that keeps groups moving towards common goals. Sometimes there are things that are controversial or that there are disagreements that happen. Those types of soft skills, I found, I needed to use those a lot, or it was helpful to have me as kind of a neutral person to facilitate things like that.

Interpersonal

Interpersonal competency is found to overlap with several themes such as communication, multi-disciplinary collaboration, and change management competencies. Specifically, interpersonal and change management competencies have a frequently noted relationship as interviewees often describe strengthening intervention proposals by anticipating areas of opposition (intrapersonal) and proactively addressing the conflict (change management). Manager 3 (large municipality)

illustrates the value of this relationship when he reflects:

> I think it's really important to be able to put yourself in everybody else's shoes, especially if you can anticipate when you're going into a contentious meeting or something; or you're really trying to make a case for something, if you can kind of anticipate maybe what their preconceived notions might be, what their leaning might be on the subject.

Other interpersonal behaviors are described as important for gaining support and participation in sustainability proposals. Respondents emphasize listening for understanding, considering multiple perspectives, and incorporating diverse ideas as vital for building mutually beneficial relationships. For example, Officer 1 (medium municipality) advises:

> Have some conversations with [city] council, like build relationships with councillors, where they feel like you're someone that cares about the organization. You care about their role in the organization and that you're not telling them what to do, you're inviting them to join you in something and then just making sure people's egos are protected.

Sustainability knowledge

Participant consensus signals that a basic understanding of sustainability principles and issues is required to work in the sustainability field, but further qualifies that a breadth of sustainability knowledge is more advantageous than depth when assessing job performance. In the words of this Coordinator 2 (large municipality):

> … but you don't necessarily need to be the deepest expert in any field but to have a good knowledge of what's going on around you in a variety of different fields is something that I feel is beneficial.

Strategic thinking

Interviewees' characterize strategic thinking with behaviors such as setting priorities and assessing environmental factors to define a clear intentionality towards achieving results that are aligned with a larger sustainability vision. In the words of Manager 4 (large municipality):

> … having a vision, having, you know, clarity of purpose, having an intent, intention to achieve the results.

Interviewees also discuss strategic behaviors such as aligning the plan's goals with the city's needs when attaining buy-in. For example, Manager 2 (large municipality) explains:

> And yeah, I think being strategic, so being able to offer kind of the city's perspective and think about other ways that it can help to meet – the programme can help to meet the city's needs. So being a strategic thinker.

Information seeking

Information seeking is regarded by respondents as a necessary competency when developing a breadth of knowledge on sustainability issues and topics. As Manager 7 (large municipality) elaborates:

> Just to stay up to date, and stay current in your field of interest, right. And yeah, and do like every day, like what's going on and look around how and what others are doing and think how you can make it better, like do it differently. And yeah, and then get any appropriate like trainings or an official course, whatever you may need to take or any webinars, seminars, that you think would help, right.

Project management

Data on job responsibilities and tasks (see Table 4) found that plan goals are often achieved

through a series of projects. Unsurprisingly, several interviewees identify project management behaviors such as budgeting, scheduling, time management, and human resource management as important to performing their job. Coordinator 2 (large municipality) explains:

> …good time management skills are something that's very important, being able to juggle kind of, you know, a number of high priority projects is also an important asset.

Future-oriented thinking

Many interviewees express why long-term thinking is necessary when formulating the implementation of their sustainability plan. For example, Planner 1 (large municipality) states:

> And you have to look long term, I mean, to get to sustainability. It's not a two- or five-year process, it's a long process where you have to take initial steps to get you in the right direction.

Manager 9 (large municipality) reflects on the importance of imagining sustainable outcomes in order to inspire others:

> …to be someone who can help others to see what the future could look like […] and then say like, yeah, we could all get around by bike. I've seen it happen in Copenhagen. It works, it works really well, and this is what it looks like. Here's a picture of it.

Sustainability values

This theme captures how sustainability values motivate job performance for interviewees, such as when Manager 2 (medium municipality) reflects on their commitment to ensuring the long-term welfare and sustainability of their community:

It's not a skill but, you know, I was born and raised in [community name omitted to preserve the anonymity of interviewee] is my home, I love my community and I have a vested interest in making sure that it sticks around. And so I'm not just doing it for the money, it's not just a job, it's actually something I want to do outside of all.

Likewise, some interviewees explain how translating their own sustainability values into personal action supports job performance by modeling to others the active commitment necessary to achieve outcomes. Director 1 (large municipality) states:

The other is through action; you need to be able to show, through your own actions, a commitment to the very things you're asking other people to do and I think that goes a long way to motivate people if they also see you behaving in the same way that you're asking for everyone else to move forward with.

Systems thinking

Interviewees describe this theme as a combination of knowledge and ability, where knowledge is the understanding of different components in any given system and ability is the identification of how the components are interconnected. This combination informs an individual's propensity for systems thinking. This is exemplified when Director 2 (large municipality) states:

… [understanding] the connectivity between some of this is quite useful and a key attribute […] you know, what are those linkages and what are the important pieces and that type of thing...

Moreover, interviewees' describe systems thinking as a means to better navigate the complex nature of sustainability issues. In the words of CAO 1 (small municipality):

Because most of the issues that we deal with, they're multifaceted and they're multi-part too in the sense that, you know, we hardly ever – so we talk about water, in

effect, more than just water. It's related to economic development, it's related to housing, it's related to food production, it's related to, you know, to nature itself. So, you know, it's the systems thinking approach and I think that it's not – we can't solve these complicated systems by having only one specialty.

Discussion

This study improves understanding of the municipal sustainability manager job and competencies for sustainability management. The results of our study elucidate *who* municipal sustainability managers are and *what* they do, thus contributing to the public administration literature by improving understanding of a largely overlooked but increasingly important job position for public performance (Fiorino, 2010; Wang et al., 2014). Moreover, our findings improve understanding of *how* sustainability managers perform their job, thus contributing to the public performance and sustainability management literatures by surfacing eleven competencies that are linked to sustainability management behaviors.

In contrast to a traditional job analysis, which views the job as an object that can be objectively observed and described, our data represent the sustainability manager job from the perspective of those who perform it, thus reflecting the subjective and dynamic reality of how incumbents understand and thus enact their job (Sanchez & Levine, 2009). In collecting data from several different organizations our study overcomes another common limitation of other competency studies, where findings can over-represent the culture of a specific work context as data is derived from individuals within a single organization, therefore under-representing more general trends in the field (Spencer & Spencer, 1993). As a result, our data represents a breadth of local government organization work contexts, positioning our results to yield more general trends across Canadian municipal sustainability managers.

The Municipal Sustainability Manager Job

Our first research question (*who* are municipal sustainability managers?) is answered by identifying the qualifications (i.e., the educational backgrounds and past work experiences) of twenty-six municipal sustainability managers across Canada. Our findings respond to calls for research on the qualifications of sustainability professionals (Egri & Herman, 2000), and contribute to the public administration field by providing data that can inform local government hiring practices as they revise and conceptualize job descriptions in response to the growing demand for public organizations to prioritize sustainability issues (Leuenberger, 2006; Wang et al., 2014; Zeemering, 2018).

Our second research question (*what* do sustainability managers do in their job?) is addressed by asking job incumbents to describe, in-detail, their job responsibilities and work activities. Our inductive analysis of this data uncovers four distinct but overlapping roles that interviewees identify with as sustainability managers: the strategist, the change agent, the collaborator, and the facilitator. Specifically, three types of work activities emerge from our data as dominate themes; project management, strategic plan formulation, and partnership management. These findings, which overlap with past research findings on the sustainability leadership activities of public administrators, suggest that the responsibility for essential sustainability management work is being delegated from senior public administrators to sustainability professionals as local governments continue to institutionalize sustainability (Wang et al., 2014).

It is worth exploring the feasible differences in work context between sustainability managers across job sectors in order to contextualize the applicability of our findings to work contexts outside of the public sector. Relative to the private sector, the public sector is more

dependent on maintaining ongoing approval and support from a variety of external stakeholders (Poister & Streib, 1999). For example, whereas goal-setting in the private sector trends towards a top-down process involving a few key decision-makers, the public sector employs a more complex and political process, often involving ongoing negotiations with internal as well as a breadth of external stakeholders (Halachmi, 1986). As a result, public sector managers tend to invest more time towards stakeholder management, often employing more complex strategies such as fine-tuning their plans in response to continuously evolving stakeholder demands or building and managing partnerships with external organizations (Streib, 1992). Accordingly, it is feasible to expect that sustainability managers in the private sector dedicate less time to stakeholder management. Conversely, we might expect to see a greater focus on partnership management in the non-profit sector— a study on practitioners in conservation organizations found that this group of professionals consider 'partnership-building' as the most important skill for their job (Bruyere, 2015). Ultimately, while we would expect to find notable differences in the stakeholder management strategies employed across sectors, complex issues such as climate change pose a distinct need for collaborative approaches that would otherwise be unessential for a majority of private-sector work (Kalesnikaite, 2019). As such, we anticipate that most sustainability manager jobs will involve some form of consultation or collaboration with external stakeholder groups, regardless of their respective job sector.

Our analysis uncovers an interesting finding regarding the dominant approach to implementing municipal sustainability plans. In particular, interviewees describe using a project-based approach to plan implementation, where goals are pursued through various short-term plans striving for specific objectives under limited time-frames. This finding is present in nearly all the interviews as twenty-five of twenty-six interviewees depict project management work

activities when describing their job. Such consensus reveals the inherent demand for public

managers to continuously respond to their situational contexts where strategic decisions are made

to improve the viability (not necessarily the impact) of intended outcomes in order to maintain

legitimacy, performance, and public value (Gieske, van Meerkerk, & van Buuren, 2019). While

the decision to employ temporary interventions can appear to conflict with the long-term time

frames (10-100+ years) of sustainability plans (Zeemering, 2018), a project-based approach may

allow public managers to keep sustainability on the policy agenda through changing political

cycles (Crawford & Helm, 2009). However, more research is needed to determine whether this

approach supports or undermines the long-range planning that is necessary to achieve a

community's sustainability vision (Fiorino, 2010).

Sustainability Management Competencies

To address our third research question (*how* do municipal sustainability managers perform their

job?) we conduct a deductive analysis of interview data and uncover eleven competency themes.

Specifically, we find that communication, change management, multi-disciplinary collaboration,

and interpersonal competencies were the most frequently mentioned, respectively. This is

followed by sustainability knowledge, strategic thinking, information seeking, project

management, future-oriented thinking, sustainability values, and systems thinking, respectively.

In light of our research focus on collaborative strategic management (as facilitated by a

sustainability plan) and our findings about the municipal sustainability manager job, we propose

that the findings discussed in this section are representative sustainability management

behaviors, and by extension sustainability management competencies.

In using pre-established sustainability competency themes to guide our coding we

identify multiple overlaps between competency themes in our data and past research findings.

For example, our competency themes of interpersonal skills, strategic thinking, and project management conceptually overlap with 'interpersonal competence' and 'project management' (Wiek et al., 2011), as well as 'capacity for empathy' and 'competence in planning and implementation' (de Haan, 2006), respectively. Whereas multi-disciplinary collaboration overlaps with 'interdisciplinary work' (de Haan, 2006) as well as 'transdisciplinary thinking' (Sipos et al., 2008), future-oriented thinking shares a similar sense with 'anticipatory competence' (Wiek et al., 2011) and 'foresighted thinking' (de Haan, 2006), with systems thinking shared across all three frameworks (de Haan, 2006; Sipos et al., 2008; Wiek et al., 2011). Ultimately, these similarities gesture towards the possibility for future research to build on this work and construct a generic sustainability competency model comprised of behavioral indicators that predict job performance across many different jobs in the sustainability profession (Salgado et al., 2018).

In contrast to the aforementioned similarities, creativity and innovation was a theme we anticipated to surface, but did not emerge in our findings. We expected to find this theme as sustainability challenges require creative solutions or innovations in order to satisfy the demands of diverse stakeholders (Conklin, 2005; Schulz, Kawamura, & Geithner, 2017). Moreover, creativity and innovation have been identified in past studies on sustainability competencies (Reid & Petocz, 2006; Rieckmann, 2012; Sipos et al., 2008; Willard et al., 2010). One possible explanation for its absence could be the increasing institutionalization of sustainable development, where there is less incentive to innovate as institutionalized standards establish themselves as procedural best-practices (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Zeemering, 2018). However, the wicked, complex problem of sustainability demands flexibility and dynamism at all levels of involvement, suggesting that innovation will inherently emerge by

the very nature of addressing sustainable development (Lawrence & Lorsch, 1967; Rittel & Webber, 1973). But perhaps this is not the role of a sustainability manager.

A closer examination of our behavioral indicators reveal further discrepancies between our findings and other reported sustainability competencies. For example, whereas the sustainability education literature emphasizes communication and interpersonal competencies for facilitating effective multi-disciplinary collaboration (Salgado et al., 2018; Wiek et al., 2011), our study participants stress the importance of these competencies to effecting influence strategies on stakeholders that can mobilize change (i.e., change management). We find that interviewees engage in complex political maneuvers, deploying situationally specific interpersonal and communication behaviors designed to gain public acceptance and support for proposed interventions. This finding supports past research that recognizes change management as fundamental to sustainability leadership (Portugal & Yukl, 1994). The central role of change management competency may also be connected to a further finding informed by our sample's selection criteria and context. Specifically, the data reveals that municipal sustainability managers have a challenging, additional job responsibility: gaining approval from elected officials and by extension, the general public (Saha, 2009; Sharp et al., 2011). An implication of this finding is that effective municipal sustainability managers do not merely implement policies as defined and directed by senior bureaucrats and elected officials but instead demonstrate sustainability leadership by shaping the opinions of the public and decision-makers in order to influence policy choices and outcomes (Fiorino, 2010).

We find indirect support for our findings from research on public management and performance that links certain behavioral profiles to effectiveness in two areas that characterize municipal sustainability plans: strategic management and stakeholder engagement. First, our

competency findings on strategic thinking, communication, and change management yield similarities to public management behaviors that have been found to predict effective strategic management in the public sector. For example, the essential ability to "communicate a vision for the future in a compelling manner" (p. 324) for effective public strategic management (Poister & Streib, 1999) overlaps with our behavioral indicators "cultivates clarity of vision" and "speak with confidence about sustainability interventions." Likewise, our behavioral indicators "adapts plans to respond to changing situational factors" and "aligns plan goals with city needs" intersect with effective strategic management behaviors, such as "identify emerging issues and understand their implication for the organization" and "craft viable strategies" (Poister & Streib, 1999, p. 324).

Second, our findings on multi-disciplinary collaboration, change management, and interpersonal competency themes hold similarities with stakeholder management strategies considered to improve the success rate of sustainability implementation. For example, our behavioral indicators "includes stakeholders early in the formulation process", "convenes stakeholders with key expertise, experience, or other resources", "adjusts plans to accommodate diverse needs of different stakeholders" and "builds relationships with colleagues, community members, elected officials, and partners" are all representative of best practices for facilitating citizen and community participation (Halachmi, 1986; Portney, 2005; Wang et al., 2014). Likewise, 76.9% of our interviewees identify the importance of multi-disciplinary collaboration to the plan formulation and implementation process, providing detailed examples of how they facilitate collaboration among citizen and local organizations to achieve the plan's sustainability goals. The behavioral indicators that comprise our multi-disciplinary collaboration competency theme correspond with practices that have been shown to facilitate meaningful or "quality"

stakeholder collaboration and linked to positive "policy outputs and outcomes" for climate change (Kalesnikaite, 2019, p. 864) and improved air quality (Fowler, 2019).

Contextualizing our findings in light of this public management and performance literature provides some support to suggest that several of the behavioral indicators identified in our study —in particular the indicators that comprise our top five competency themes— represent patterns of behavior that link to job performance for sustainability managers.

Limitations and Future Research

To the best of our knowledge, the present research represents one of the first studies to provide a detailed assessment of any designated sustainability job in the public sector. While our research design contributes foundational insights to this undeveloped research topic, our findings must be understood as operating under key limitations. Our targeted research design requires a level of specificity that inevitably creates limitations regarding the scope and generalizability of our findings. Such methodological constraints offer salient avenues for future research on sustainability professionals.

A limiting factor of our study in comparison to alternative methods in competency research, such as behavioral event interviews (BEI) or direct observations, is its reliance on expert opinion which can be less accurate in verifying competencies due to its increased susceptibility to personal bias. Moreover, while our study results in a model informed by sustainability management experts, a different method such as McClelland's BEI method would be necessary to identify the "differentiating behaviors that distinguish superior from average performers" (Getha-Taylor, 2008, p. 115; Spencer and Spencer, 1993).

Our applied selection criteria bear inescapable limitations regarding the scope and applicability of our findings. Specifically, our findings remain tied to the public sector. As

discussed, the job of a sustainability manager in other sectors would be informed by different workplace contexts and organizational pressures that, in turn, would feasibly change the perceived importance of specific competencies that link to sustainability management (Niu, Wang, & Xiao, 2018). In light of this limitation, we call for future research to investigate these differences in order to conceptualize a more representative profile of this job. Moreover, our findings are limited by the geographical scope of our Canadian-based examination, and thus need to be understood as a product of the relatively stable and uniform setting across the Canadian economic, political, and social context. Discontinuity can be anticipated as our findings engage with other research positioned in an international context, where more pronounced conflicts could exist between the prioritization of sustainability initiatives and economic development. Accordingly, we call for future research that extends beyond our Canadian-based parameters.

Conclusion

A collective effort is essential for overcoming the social, ecological, and economic challenges inherent to achieving sustainability, as reflected by the widespread uptake of public policy agendas, such as localizing the United Nations Sustainable Development Goals, and the thousands of local governments developing sustainability plans worldwide. The scope of this global response gestures towards the enormity of the challenge ahead, demanding a better understanding of what drives performance in local-level sustainability transitions. While significant work remains to understand what aspects drive public performance in this important policy arena, this article contributes by shedding light on one important actor in these sustainability transitions, thus improving understanding of "how sustainability efforts are managed in local government" (Zeemering, 2018, p. 141).

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