

## **Sustainability Education in First Nations Schools: A Multi-site Study and Implications for Education Policy**

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### **Abstract**

This paper explores the form and extent of sustainability uptake in education policy in First Nations-managed K-12 schools, and discusses strategies First Nations' educational communities use to overcome barriers encountered in sustainability education practice. Interviews were conducted with educators across four different Canadian schools and content analysis was used to draw out key themes of analysis. These include educators' articulations of relationships to land, including a relational legacy of living in an implicitly sustainable and respectful way. Participants also described how culturally and geographically relevant pedagogical approaches to sustainability are challenged by systemic and localized barriers. Participants perceived that under-resourcing and administrative challenges limit the integration of sustainability across curricular areas, hindering educators' abilities to develop appropriate innovative programming and resources for First Nations' students. They have been able to overcome these obstacles, to some extent, by harnessing community resources to indirectly include sustainability in the curriculum. Implications for educators, policy makers, and agencies are discussed.

*Keywords: First Nations, Indigenous, education policy, sustainability education, environmental education*

Indigenous<sup>1</sup> peoples are the fastest growing population in Canada, one that, between 2006 and 2016, increased at a rate more than four times that of the rest of the country's population (Statistics Canada, 2018). The Indigenous population, as a whole, is much younger than the rest of the country's population. Over the same decade, the number of Indigenous youth (15 to 34 years old) increased at a rate (39%) more than six times that of the rest of the country's youth population. An important investment in the future of Indigenous youth is to ensure they have access to culturally-relevant education, which is already available to many other Canadian youths in the public education system. It is well documented that culturally-relevant education is a critical contributor to Indigenous student success, which often includes a focus on land and issues of cultural and environmental sustainability (Anuik, Battiste, & George, 2010; Baker, 2008; Canadian Council on Learning, 2009; Henderson, Carjuzaa, & Ruff, 2015; Lewthwaite, & McMillan, 2010; Mombourquette & Bruised Head, 2014; Preston, 2016; Preston, Claypool, Rowluck, & Green, 2015 Toulouse, 2016).

This paper explores how sustainability is being incorporated into K-12 education policy in First Nations schools, drawing on the experiences and perceptions of research participants working in four First Nations-managed schools<sup>2</sup>. We also explore perceived barriers to incorporating sustainability education

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<sup>1</sup> Indigenous herein means descendants of the original inhabitants of Canada which includes: First Nations people (referring to status and non-status), Inuit (the Indigenous peoples of the Arctic), and Métis (defined by the Métis National Council (2011, p. 2) as "a person who self-identifies as Métis, is distinct from other Aboriginal peoples, is of historic Métis Nation Ancestry and who is accepted by the Métis Nation"). First Nation also refers to a geographical place where a group of First Nations people live on land set aside for them specifically.

<sup>2</sup>Sustainability" is defined here, and in the broader Sustainability and Education Policy Network (SEPN) project, as including a minimum a focus on land or environment, regardless of the terminology used. Interwoven aspects of cultural knowledge and relevancy, well-being, or other considerations may also be included.

from the points of view of educators and administrators, including how they have overcome these barriers. In what follows, we frame these issues by first providing an overview of the policy context and a review of related literature. Following our discussion of the study's findings, we locate participants' discussions within broader debates on educational reform and conclude by providing recommendations based on participants' experiences for including sustainability education in First Nations schools.

## The State of Indigenous Sustainability Education in Canada

### *Overview of Policy Context<sup>3</sup>*

The sociopolitical context, previous Indigenous education policy research, as well as the relationships between legislation and policies, provide essential perspectives on current practices of inclusion of Indigenous worldviews in education. Indigenous peoples have long “advocated [for] learning that affirms their own methods of knowing, cultural traditions and values” (Canadian Council on Learning, 2007, p. 2). This set of values includes “forms of education based on holistic ways of viewing the natural world” (Herman, Vizina, Augustus, & Sawyer, 2008, p. 15), such as observation, teaching by example, and modeling practices (Little Bear & Battiste, 2000). As Tuck and McKenzie (2015) have written, common in Indigenous orientations to place is an understanding that “Land is; therefore we are” (p. 56). This belief is a recognition that Indigenous peoples' identities, languages, ways of being, cosmologies, belief systems, sciences, and pedagogies have developed within the context of their relationships with the land. Over Indigenous peoples' long history, learning has mostly taken place on the land, with the land as primary text and teacher. The colonization and settlement of traditional territories, however, has steadily eroded access to the land, impacting every aspect of Indigenous lives.

Educational spaces founded within neo-colonial structures have been sites of ongoing violence against Indigenous epistemologies, peoples, and lands (Ahenakew, 2016). In 1867, Section 91(24) of the British North American Act assigned responsibility for “Indians and lands reserved for Indians” to Canada's federal government, and an 1884 amendment to that Act made attendance at residential schools, and other schools, mandatory for First Nations children. With the introduction of formalized education systems, administered by the state and operated by churches, and First Nations peoples' forced participation in these systems, First Nations children's primary sources and sites of learning became Western-educated teachers, written texts, and classrooms. As part of what Nishnaabeg scholar Leanne Simpson (2017) has described as “the machinery” (p. 15) of colonization, these education systems were designed to assimilate and disenfranchise Indigenous people – that is, to dispossess them of their identity and lands. The physical violence directed at Indigenous peoples under colonization is rightfully recognized as genocide. It is equally important to recognize that “displacing or removing Indigenous peoples from our traditional lands and waters [and cutting] our ties to critical sources of our traditional knowledges [is] epistemicide” (Wilson & Laing, 2019, p. 133).

The last residential school in Canada closed in 1996. The disassembly of the residential school system followed a focused effort on the part of Indigenous leadership to regain control of Indigenous education, including the 1972 release of the National Indian Brotherhood's policy paper, *Indian Control of Indian Education*. These actions also resulted from a determined effort on the part of many Indigenous survivors of the residential school system and their descendants to speak out about their experiences at the schools and the impacts those experiences have had on their lives. Through legislative initiatives between 1972 and 2010, educational administration of First Nations schools devolved, with the transference of responsibility for both elementary and secondary education to local communities (Simeone, 2011). However, as Fallon and Paquette (2012) note in their critical analysis, “the majority of these educational agreements promoted a hegemonic model of power that fosters asymmetrical relations between First Nations and non-First Nations cultures and supported assimilationist policy discourses advocating unequal power relationships between these different groups” (p. 3).

In March 2014, the controversial Bill C-33: *First Nations Control of First Nations Education Act* established a framework enabling First Nations to obtain control of elementary and secondary educa-

<sup>3</sup>This section's discussion of Indigenous peoples' relationships with the land (a concept that encompasses the land itself and the waters, air, plants, animals and other beings that constitute, and, in their reciprocal relationships, sustain all life) and of the impacts of Indigenous peoples' forced participation in residential schools draws on a manuscript currently being prepared by Alex Wilson, one of the co-authors of this article.

tion. The bill applied to all on-reserve schools except those that are self-governing, including under the Mi'kmaq Education Act and the First Nations Jurisdiction over Education in British Columbia Act (Bill C-33, 2014). Although the stated intention of Bill C-33 was to give First Nations control of their education, the Act was criticized for continued tokenism, as well as scant resources and lack of balance of power (French, 2014). In addition, the Act did not provide mechanisms for including cultural teachings, anti-oppressive learning, or developing understandings of environmental sustainability, or land-based education (Wattie, 2014). Further cause for concern was that Bill C-33 specified education must be taught in one of Canada's two official languages, not in Indigenous languages (Onion Lake Cree Nation, 2014). The passing, criticism, and subsequent withdrawal of the bill exemplify the complexity and varied nature of opinions on needs regarding Indigenous education (Mishenene, Toulouse, & Atcheson, 2011).

As of 2011, there were 518 band-operated, or First Nations schools, in Canada (Government of Canada Standing Senate Committee on Aboriginal Peoples, 2011). Enrollment at First Nations schools is also increasing, resulting in expanding needs for funding, programming, and infrastructure (Aboriginal Affairs and Northern Development Canada, 2015). However, the growth in schools and student numbers, and the allocation of federal funding to these schools and students are out of balance. Government, research studies, and media sources all report that First Nations schools are "severely underfunded" compared to off-reserve schools (Canadian Press, 2015; Fallon & Paquette, 2012; Marion, 2015; Office of the Parliamentary Budget Officer, 2016; Palmater, 2012; Simeone, 2011). Since 1996, funding increases for First Nations schools have been capped at 2% per year, compared to an average 4.1% annual funding increase for provincial and territorial school systems (Simeone, 2011; Government of Canada Standing Senate Committee on Aboriginal Peoples, 2011). In 2012, the Assembly of First Nations<sup>4</sup> estimated First Nations schools had a cumulative funding shortfall of over \$3 billion since 1996. This finding is consistent with the Office of the Parliamentary Budget Officer's (2016) estimate that the shortfall in funding for education programming in band-operated schools was between \$300 to \$500 million in 2012-13 and between \$336 and \$665 million in 2016-17. This underfunding, accompanied by a lack of First Nations-specific educational resources, has hindered the development and provision of appropriate schooling for First Nations children.

While the last residential school in Canada closed in 1996, the perpetuation of institutionalized racism and forced assimilation is sustained when education provision does not center on First Nations' worldviews and value systems (Battiste, 2005, 2013)<sup>5</sup>. The ongoing lack of inclusion of Indigenous knowledge in formal education is linked with poor outcomes for Indigenous peoples in Canada. Fewer than 42% of Indigenous people 20-24 years of age who live on-reserve, and fewer than 70% who live off-reserve in Canada have completed high school, in comparison to a national average of 90% for that same age group (Statistics Canada, 2011). Failure to complete high school is correlated with low employment rates (about 40%), and precludes post-secondary participation, with a university degree correlated with high employability (80%) regardless of Indigenous status (Richards, 2014). Improved education outcomes for Indigenous students would contribute to economic equality (Wilson & MacDonald, 2010) and better quality of life (Battiste, Bell, & Findlay, 2002; Shankar et al., 2013).

A number of other factors contribute to the challenges of this situation. As already discussed, jurisdictional and governance issues, including limited federal funding for diverse local school mandates, contribute to barriers in administrative and educational reform. The National Indian Brotherhood's 1972 report, *Indian Control of Indian Education (ICIE)*, advocated for autonomous delivery of First Nations education. Following this report, First Nations teacher education programs, band-controlled schools, and locally developed curricula were initiated in many communities (Herman et al., 2008). The Royal Commission on Aboriginal Peoples (RCAP) Report (1996) supported these initiatives by recognizing education as a lifelong, continuous process, requiring stable and consistent support. However, contemporary gaps in education experience and outcomes indicate that more improvement is necessary, including increased funding (Battiste, 2013). In addition, Indigenous Services Canada (ISC, formerly Indigenous and Northern Affairs Canada or INAC), the Government of Canada department which has been responsible for policies related to Canada's Indigenous peoples in the past, provides First Nations schools with little guidance with regards to curriculum, and more importantly for our focus here, no direction for engage-

<sup>4</sup> The Assembly of First Nations (AFN) is a Canadian national advocacy organization representing First Nation citizens, whose work is directed by First Nations leaders from coast to coast.

<sup>5</sup> Decolonizing approaches to education in off-reserve schools for non-Indigenous students are also key to addressing systemic racism and the legacies of settler colonialism in Canada.

ment with environmental sustainability (Wiseman, 2016).

In addition, the inclusion of Indigenous languages and culture in the education system is challenged by the inflexibility of non-Indigenous educational design and accreditation systems imposed by dominant Canadian institutions. The importance of language retention to local educators has clashed with teacher accreditation requirements; for example, it is difficult to have Elders recognized as educators by overseeing agencies, resulting in an under-utilization of their expertise (Jenkins, 2007). Already thin resources are stretched across in-class teaching, special needs programming, and locally relevant experiential curriculum components, all of which thrive more fully in better-funded mainstream Canadian systems (Phillips, 2014a, 2014b).

The Truth and Reconciliation Commission of Canada (2015) recently examined the state of education for Indigenous people and made several key recommendations in their Call to Action, including (1) closing the funding gap, (2) developing culturally appropriate curricula, and (3) enabling Indigenous parents and community members to participate more fully in their children's education, both on and off-reserve. Despite recognition of these issues, there remains substantial need for improvement in the Canadian education system's responsiveness to Indigenous students, which includes attending to the continued perpetuation of Eurocentric education approaches that both implicitly and explicitly teach Indigenous students to "distrust their Indigenous knowledge systems, their Elders' wisdom, and their own inner learning spirit" (Battiste, 2013, p. 24).

Thus, sustainability uptake in First Nations schools must be considered within the contexts of resource inequality, historical cultural assimilation, and ongoing efforts at cultural revitalization and decolonization. Calls for broader federal and provincial efforts to integrate Indigenous orientations as part of sustainability curricula have been made (Battiste, 2009; Kulnieks et al., 2014; McKenzie, 2012; Government of Saskatchewan Ministry of Education, 2011). Prior research suggests Indigenous orientations to sustainability are typically being incorporated into Canadian school programming in a localized manner, often in opportunistic and tokenistic ways (Aikenhead & Elliott, 2010; Lewthwaite & Renaud 2009). However, there are Indigenous schools employing experiential, land-based, and traditional knowledge-based learning modules in ways that align with and/or deepen approaches to land-based, environmental, and sustainability education and it is our intention here to attend to and learn from these initiatives (e.g., Bang et al., 2014; Swayze, 2009).

### *Indigenous and Non-Indigenous Sustainabilities*

Since the 1972 Declaration of the United Nations Conference on the Human Environment recognized the human right to a healthy environment, there has been a steady development of national and international sustainability declarations and policies relevant to educational systems and programming (Wright, 2002). These agreements have borne indices, tools, and guides for implementing and assessing environmental sustainability initiatives in educational contexts (Wright, 2002; Esty et al., 2005).

Contemporary educational bodies, both in Canada and abroad, are increasingly emphasizing the importance of focusing on environment and sustainability in 21st-century learning (Council of Ministers of Education, Canada [CMEC], 2008; United Nations Education, Scientific and Cultural Organization [UNESCO], 2014). An increased national focus on environment and sustainability in formal K-12 education was initiated following the Canadian government's uptake in the 1990's<sup>6</sup> in response to the United Nations Decade for Education for Sustainable Development, which began in 2005 (McKeown & Nolet, 2012; UNESCO, 2003). However, Indigenous scholars and allies have suggested that Indigenous values, ethics, and experiential practices can be aligned with the concept of sustainability, belong in the curricula, and are more relevant to First Nations schools than globalized perspectives (Aikenhead & Michell, 2011; Beckford et al., 2010; Berkes & Berkes, 2009; Cajete, 1999; Kulnieks, Longboat, & Young, 2014; Lewthwaite et al., 2014; Swayze, 2009).

**The whole-school approach to sustainability education.** Many non-Indigenous indices adopt a "whole institution approach," which conceptualizes sustainability in education as comprising five domains: (1) governance, (2) curriculum/teaching, (3) research, (4) operations, and (5) engagement/community outreach (Henderson and Tilbury, 2004; Moldan, Janouskova, & Hak, 2012; Urbanski & Leal Filho, 2015; Vaughter et al., 2013, 2016). Broadly speaking, (1) governance includes organizational functions

<sup>6</sup>This development was largely driven by Agenda 21 (United Nations Conference on Environment and Development [UNCED], 1992).

and decision-making processes. These processes encompass day-to-day administrative activities such as financial oversight and personnel management, as well as higher-level functions, such as goal-setting and strategic planning, all of which can be used to integrate sustainability goals across education systems. (2) Curriculum/teaching includes both direct and indirect teaching and learning, with curriculum providing foundational learning for environmental sustainability. (3) Research includes academic inquiry into sustainability-related initiatives (Kronlid & Öhman, 2013; Blewitt & Cullingford, 2013; Spangenberg, 2011), which provides new insights and discoveries and can benefit pedagogy through course offerings (Cotton, Warren, Maiboroda, & Bailey, 2007; Cotton & Winter, 2010). (4) Operations typically focuses on improving the sustainability of infrastructure to improve indoor air quality; water and waste-water treatment; subscribing to renewable energy providers; and other practices that commit the institution to sustainability (de Burgos Jiménez & Céspedes, 2001; Maloni & Paul, 2011). Increasing sustainability in operations often involves ad hoc infrastructure upgrades, but should also include commitments to building new greener infrastructure. Systemic changes to funding and support models are typically required prior to infrastructure greening across both First Nations and wider public school systems (Kuzich, Taylor, & Taylor, 2015). (5) Community engagement is characterized by sharing sustainability initiatives among educational institutes and the broader community, developing community partnerships and networks, as well as developing appropriate and engaging outreach products (Association for Advancement of Sustainability in Higher Education [AASHE], 2014). Community engagement can occur in many forms, including action research projects, collaborating on greening environments around schools, and programming in community gardening (Barlett & Chase, 2013).

These five sustainability domains can provide a helpful framework for students, staff, and administrators working to develop strategies to support sustainability uptake in their educational contexts (Martin, 2011). In schools, these strategies, values, and practices are taught in direct ways, for example, through classroom projects and discussions, as well as in indirect ways such as modeling values and awareness that supports engagement. A similar set of values emerges, and is developed in, many Indigenous communities (Edwards et al., 2013), but the origins of these values reside in very different cosmologies and inform different ways of life and learning.

**Indigenous land-based education.** For most First Nations, land is central to the philosophies of education (Vizina, 2008) and Indigenous belief systems emphasize living in a respectful relationship with the land. While these beliefs resonate strongly with contemporary understandings of environmental sustainability, Indigenous understandings of sustainability are holistic in that they are not separable into discrete components (Kovach, 2010). Stewardship of land, through the practice of living sustainably within an interdependent environment, positions “sustainability” in relation to Indigenous knowledge as a way of life.

Scholarship on Indigenous pedagogy for cosmology and land education in Canada is an emerging discipline (Hatcher, 2012; Tuck et al., 2014), however, scholars such as Tuck, McKenzie, and McCoy (2014) and Wilson (2016) have explored the role of Indigenous cosmologies and traditional values in considerations of land and land education. Indigenous sustainability is taught and transmitted through practices and stories passed from one generation to the next through practical and land-based activities, as well as through relational learning not easily compartmentalized by Eurocentric sustainability education curricular components (Kovach, 2010). Indigenous holistic education “puts Indigenous epistemological and ontological accounts of land at the center, including Indigenous understandings of land [and] Indigenous language in relation to land” (Tuck et al., 2014, p. 13). For many First Nations groups, land can be considered a teacher and conduit of memory (Wilson, 2005). As such, the use of land-based experiential education in encouraging stewardship naturally focuses curriculum on Indigenous realities and supports alternatives to settler colonialism and Eurocentric education design and content delivery (Calderon, 2014). Importing Indigenous knowledge into mainstream curricula can be useful as it provides an avenue to address the damage done through non-Indigenous paradigms of colonialism, and because Indigenous relationships with the land have been maintained by sound and practical experiential pedagogies (Beckford et al., 2010). However, the “importing approach” is problematic in that it has also been used to maintain the status quo, and thus aids and abets cultural assimilation in complex ways (A. Wilson, personal communication, December 29, 2015).

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In the next section, we outline our research approach as well as the methods we used in this study. We discuss the research findings and finish with conclusions and recommendations based on the implications of the results.

## Research Approach and Methods

This project was conducted as part of a broader research program of the Sustainability and Education Policy Network (SEPN), an international research-based partnership examining the range of sustainability policies and practices being developed, implemented, and experienced in education. SEPN employs comparative analyses to explore evidence of, and influences on, sustainability uptake in education policy and practice, including relationships between policy and practice. Since 2012, SEPN's K-12-focused research has included a census uptake of high-level sustainability initiatives in 374 K-12 school divisions (presence of a sustainability policy, participation in eco-certification programs, presence of sustainability staff); in-depth content analyses of policy documents from 13 provincial and territorial ministries of education; a national survey examining stakeholder perceptions of sustainability uptake in the K-12 system, including drivers and barriers; and a series of in-depth comparative site analyses case studies of 20 K-12 schools, 10 school divisions, and 7 ministries of education in Canada and Australia. The ultimate goal of SEPN's research is to provide rigorous, comparative, evidenced-based understandings of policy, and enable more in-depth responses to sustainability through education.

Historically, non-Indigenous researchers who have conducted research on, or with Indigenous people, have done so in a method that fails to recognize Indigenous Peoples' distinct pedagogies and protocols, and thereby perpetuates colonization (Smith, 2012). Just as Eurocentric education can perpetuate colonization (Battiste, 2012), research methods can do the same. As university-educated women, the majority of whom are of European descent (first author included), we are attentive to the fact that we cannot represent endogenous research. Non-Indigenous researchers must have "a more critical understanding of the underlying assumptions, motivations and values that inform research practices" (Smith, 2012: 1) in order to accomplish meaningful and respectful research, and to do so we draw, in part, on recent literature exploring Indigenous methodologies (Kovach, 2010; Smith, 2012; Wilson, 2005). An understanding of power, control, and privilege is vital to successfully conduct this study as we, the researchers, are advantaged with much power, gained through education, race, class, and so forth.

This research draws on understandings from approaches to decolonizing research, as well as from exploratory, qualitative research grounded in conversational interviews. While this research does not adopt a decolonizing methodology itself, substantial efforts were made to ensure this research reflected community needs and priorities from the outset. Three initial interviews were undertaken with individuals from the Assembly of First Nations, Métis National Council, and the University of Saskatchewan's Aboriginal Education Research Centre (AERC) to obtain input prior to defining the research scope and methodology. These interviews also identified key contextualizing literature and documentation to explore First Nations schools' potential engagement with sustainability education; informed the development of research methods and protocols; and identified potential participant communities with which to engage in the research.

Semi-structured interviews were conducted with a total of 12 local Elders, principals, and teachers in schools in the Nuu-chah-nulth territory in British Columbia, Treaty Four and Treaty Six territory in Saskatchewan, and the Peace and Friendship Treaty territory which spans Québec and New Brunswick. Seven of the participants identified as female and five as male. Between one and four interviews were conducted in each location. All of the interviews in British Columbia and Québec, and one interview in Saskatchewan were conducted over the phone, while the remaining Saskatchewan-based interviews were conducted in-person in onsite visits. All of the interviews were conducted by the first author who employed community-specific protocols (e.g., traditional tobacco offerings in the Northern Plains region) when interacting with the participants. The interviews lasted between 16 and 70 minutes and were recorded with participants' permission.

The interview protocol was organized into six sections, with the content developed based on needs identified during pilot interviews and with consideration to the whole school sustainability domains of governance, teaching, curriculum/teaching, operations, and community engagement or outreach. Participants were first asked to discuss background information regarding their school and community, as well as the school's relationship with Indigenous and Northern Affairs Canada (now ISC) and applicable provincial education systems. The schools' management and governance structures, as well as their pertinence

to sustainability education, were discussed. The interviews then explored curricular content and teaching methods, as well as operations-based environmental sustainability initiatives taking place in the participants' setting. The interviews concluded by asking participants about research and community engagement practices pertaining to sustainability education where they work. Open-ended questions allowed for conversation to emerge naturally.

The audio recordings of the interviews were transcribed and the data analyzed using comparative content analysis (Krippendorff, 2012; Patton, 2005) of transcripts as well as relevant policy and practice documents, in alignment with guiding documents for decolonizing research within the context of First Nations people (Bartlett et al., 2007). We identified similarities and differences in emergent themes across all four schools; with some themes common to all schools, some common to several schools, and some unique to one school (Bartlett et al., 2007). While these results are not generalizable to the population of Indigenous peoples in Canada as each individual First Nation has unique cultural practices, traditions, and systems of education, they do provide insights about culturally responsible sustainability initiatives, as well as the types of barriers to sustainability uptake occurring in Indigenous education in Canada.

## Research Findings

The participants described a variety of locally-developed sustainability initiatives taking place in the First Nations schools and communities within the study. Local and systemic barriers to formal sustainability uptake in education were also discussed. Table 1 summarizes various initiatives identified by participants in describing their achievements across the five whole school sustainability domains of governance, curriculum/teaching, operations, research, and community outreach. The themes in the table below were developed inductively through analysis of participants' transcripts, as well as deductively through consideration in relation to the specific questions included in the interview protocol. In the table, "X" indicates whether the initiative was present in the school and "p" indicates whether the initiative was partially in place, or in the process of being developed. We present the results of our thematic analysis in this table in the interests of providing a foundation through which to orient the reader to the more complex and in-depth discussion of our findings which follows.

Table 1

*Incorporation of Sustainability Domain in Curriculum by Treaty Area/Participant Group*

<b>Whole-school Sustainability Domain:</b>	<b>British Columbia</b>	<b>Western Saskatchewan<sup>a</sup></b>	<b>Southern Saskatchewan<sup>b</sup></b>	<b>Eastern Québec</b>
<b>Governance</b>				
<i>A policy directs sustainability in the school</i>				
<i>Local sustainability committee established</i>	<b>X</b>	<b>p</b>		
<i>School works with regional education councils</i>		<b>X</b>	<b>X</b>	<b>X</b>
<b>Curriculum/Teaching</b>				
<i>Local curriculum available</i>				
<i>Sustainability incorporated across all subjects</i>				
<b>Curriculum/Teaching</b>				
<i>Land-based programming offered</i>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
<i>Elders and Knowledge Keepers incorporated</i>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
<i>Educating for 'both worlds'</i>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

<b>Whole-school Sustainability Domain:</b>	<b>British Columbia</b>	<b>Western Saskatchewan<sup>a</sup></b>	<b>Southern Saskatchewan<sup>b</sup></b>	<b>Eastern Québec</b>
<i>Indigenous language immersion program(s) offered</i>	<b>X</b>	<b>X</b>		<b>X</b>
<b>Operations</b>				
<i>Sustainability master plan developed</i>				
<i>Energy reduction plan developed</i>	<b>P</b>			<b>X</b>
<i>Comprehensive recycling available in community</i>	<b>X</b>			<b>X</b>
<i>Students participate in recycling</i>	<b>X</b>		<b>X</b>	<b>X</b>
<i>Funded solely through INAC (now ISC)</i>			<b>X</b>	
<b>Research</b>				
<i>Formal research on sustainability conducted</i>				
<b>Community Outreach</b>				
<i>Partnered with local post-secondary institutions on sustainability initiatives</i>	<b>X</b>		<b>X</b>	

<sup>a</sup>Treaty Six Education Council, <sup>b</sup>Treaty Four Education Alliance

**The role of regional councils in educational governance.** At the local level, none of the participants could identify established policies directly pertaining to sustainability education in their schools. While sustainability committees were in place or under development in two of the four territories in the study, nine participants indicated sustainability policies were not necessary due to sustainability being innate to Indigenous worldviews and lifestyles. For example, one participant explained, “It [sustainability] is about developing appreciation for the land and an appreciation for the history and the traditions and the technology that went along with that.” Some participants discussed governance challenges related to INAC (now ISC) requirements and guidance. For example, participants described difficulties formalizing systems to create and implement curriculum given requirements for writing and reporting curricula imposed by INAC (now ISC). Participants also discussed that a lack of leadership or guidance on how to resource local educational governance solutions posed barriers to sustainability education in their schools.

Treaty or tribal-based councils were described by participants in three locations as an innovation that supported the self-actualization of First Nations schooling. These councils, which provide local schools with guidance on educational content, were described in some cases as inherently autonomous for overcoming federal inequities through local governance solutions. One respondent noted that reserve schools in Treaty 6 have the option of working in partnership with the Treaty Six Education Council (TSEC) to increase education capacity. TSEC provides services that honour the educational experience of First Nations people, engage students in educational activities, and prepare students to embrace the future with confidence (Treaty Six Education Council, n.d.). Similarly, the Treaty 4 Education Alliance (T4EA) works with 11 schools to: “ensure that students benefit from rich, meaningful and relevant learning experiences, within secure learning environments” while developing and delivering “sustainable educational processes that place children and communities at the center of common Treaty Four school improvement” (Treaty 4 Education Alliance, n.d.). T4EA provides an arena for community Elders, leaders, parents, educators, youth, and children to contribute to their local education in order “to make decisions for and about themselves and their children” (Treaty 4 Education Alliance, 2014). However, a participant working in Treaty 4 indicated that all of the governors were engaged on a voluntary basis and were not compensated for their involvement.

**Overcoming barriers in including sustainability and Indigenous knowledge in curriculum.**

Seven participants noted a lack of sustainability-related initiatives in teaching and curriculum, which was attributed to underfunding, small population sizes, distance from urban centers, lack of community leadership, restricted employment opportunities, and historical contexts. In particular, participants perceived underfunding and the burden of INAC's required administrative reporting as major limits on their adaptive capacity in relation to this domain. Ten participants perceived that, as a result of administrative pressures and different conceptualizations of how sustainability should fit within their schools' programming, locally-based sustainability curriculum advancement was slow to emerge, and difficult to express in existing structures. The educators we interviewed were aware of gaps and inadequacies in provincial curricula and teacher education programs. Preparing teachers to work with Indigenous students requires honouring Indigenous content and pedagogy as more than an "add on" subject. Participants noted that new teachers face challenges working with Indigenous students in their schools. Three participants indicated that new teachers needed more support and training in general to work in First Nations schools due to an inadequate focus on Indigenous content and pedagogies in pre-service teacher education programs, including in relation to sustainability and land education.

Barriers, such as underfunding, produce competing priorities that restrict the ability of First Nations educators to create innovative curriculum(s) reflective of local pedagogies and ontologies. For example, one participant noted that their school was 130 students over capacity, resulting in larger class sizes and an unreasonable teacher to student ratio. Without the funding to hire more personnel, teachers struggled to keep up with classroom demands and extra programming was unachievable. Another participant noted: "Our teaching staff are grossly underpaid... I do have teachers who have looked elsewhere. Really, really excellent teachers because they needed to support their families and needed to pay their mortgage and they couldn't do it on our salaries."

Many respondents reported that their schools followed provincial curriculum despite it not being required. While three participants acknowledged that while provincial curricula has been changed to include Indigenous perspectives and ways of understanding, several indicated that many First Nations community representatives consider these improvements insufficient and not reflective of regionally-specific knowledges. Moreover, several participants felt using provincial curriculum to relay Indigenous ways of knowing through a Eurocentric framework to be inappropriate for Indigenous students and teachers.

As Indigenous people have been sustainably engaged with the environment for thousands of years, many of the educators we interviewed believed the concept of sustainability education is synonymous with Indigenous practices of respect and reciprocity and implicit in First Nations practical learning. Eight of the 12 participants explicitly stated that Indigenous youth should be taught using Indigenous pedagogies and ontologies. For example, one participant stated, "It has to do with the youth and the demand from the community. With Indigenous youth, there is a disconnect with the cultural identity so by increasing it in the school it helps empower them." Several participants connected the importance of including local culture, traditions, and worldviews in teaching to Indigenous student's success. For example, another participant said, "We are providing our children with the skills to interact, be successful in both worlds, in the cultural aspects and in the public life." Similarly, a third participant stated,

Being a First Nations school we incorporate an immense amount of language and culture, we have it already, co-existing, in collaboration with the curriculum, so that everything that is taught in the curriculum is easily adapted to the Aboriginal worldview.... The timing in which we might talk about it or teach it might be slightly different, but it is still addressed through an Aboriginal worldview.

When asked about sustainability education taking place in their settings, only two participants identified sustainability education as being taught across the curriculum.

Most participants noted that sustainability education resonated strongly with Indigenous epistemologies and values of holistic living and interdependency, and thus *should be* integrated into every subject area although participants noted that communities themselves place varying levels of importance on different aspects of sustainability education.

Local sustainability education initiatives described by participants often reflected local contexts and resource limitations. Both respondents from Saskatchewan, for instance, described the strong industrial arts classes in their schools. One school utilized discarded school renovation material and had students learn carpentry skills by constructing doghouses and other small projects. The other school purchased

low-cost bikes at auction for students to refurbish and use as transportation. The participating school in eastern Québec started a walking club to curb diabetes and increase physical activity. Although the initial reason for the walking club was to improve physical fitness, the participants told us that the principal identified the positive benefit of environmental awareness and hoped to replace one of the existing school buses with a *walking school bus* to decrease greenhouse gas emissions. These examples demonstrate the ingenuity of educators engaging in practical sustainability education within the limitations of their resource barriers.

The interviews revealed the vast importance of historical legacies, cultural understanding, and language retention for community wellbeing. Several participants explained that colonial actions have left many communities with a fear of formal education due to the near extinction of many Indigenous ways of knowing, stories, and languages under colonial schools. For example, one participant relayed an experience an Elder told her about:

I remember one time going to school at the university and the professor was going to teach on, Almighty Voice [a historical Cree leader]... and she brought this book and then I told her, that's not the way it is, that's not the way my kokum told me. Then she got mad and she says well you teach this unit then. I said no, you have to go the proper route, you have to ask me first, but I never did share ... that is not what my kokum told me.

Participants in all the participating territories described land-based education such as culture camps as an embodied method of cultural practice and retention. Another participant described these programs as providing students with opportunities to experience Indigenous knowledge through Elders, Knowledge Keepers, and community members who organize and facilitate activities. These programs incorporate sustainability education through the teaching of language and culture during land-based education. One participating school in Saskatchewan held school-wide culture camps where students learn together while enhancing their cultural and language knowledge. Students participating in this land-based education program are out on the land four times a year and learn about relations, knowledge, and languages connected to that land. A participant related that the other participating educational council in Saskatchewan held culture camps for secondary students in which students learned hunting skills such as cleaning game and survival skills; students also participated in other teachings, including an emphasis on Cree language acquisition. Another participant described a program at the school in British Columbia developed by a local educator, which included regional field trips for students to rediscover the Indigenous names for places and understand historical and cultural relevance for the Salish People.

The ongoing impacts of residential schools on Indigenous peoples in relation to language acquisition was a key theme that emerged from the interview data. Three out of four of the participating school boards offered Indigenous language immersion programs, many of which were only recently developed during a refocusing of school priorities on Indigenous language learning and retention. All of the schools engaged Elders and Knowledge Keepers in their programming, who emphasize how “language is part of your culture, if you lose [y]our language you lose your culture ... we are on the right track... we are on the healing track...we are allowed to bring our language and our culture here [to school].” Elders at one participating Saskatchewan school shared experiences of how they were not allowed to speak their native language at residential schools, which inhibited their acquisition of English and left them unable to communicate with or understand their teachers. One participant recounted that the “first two years of my schooling I didn't even talk at recess time. I followed my older sister around because I couldn't speak English and I was so afraid, this fear of getting strapped, because we were threatened.” This participant explained that many communities now prioritize language maintenance, resilience, and restoration within the community, and cited these factors as reasons for the lack of focus on sustainability education. Language maintenance and resilience (along with physical housing issues and other social problems) were identified as more immediate priorities to the school and community, as opposed to sustainability education, which although was admitted as being important, had less tangible and immediate positive outcomes.

Participants described how the incorporation of language and culture benefited not only students but also Elders in their communities. Elders (who may have a negative association with formal education due to their experience with residential schools) see the social benefits of formal education emerge when language is returned to other community members and to children, whereas the benefits of sustainability education are not as readily apparent:

I think it just has to do with the youth ... specifically there is a disconnect with the cultural

identity so by increasing it [language education] in the school helps to empower them and get them knowledge because they are probably not getting that at home, you know? The school, like I said, is a main focus, so they have round dances and cultural events at the school so it just sort of goes hand and hand.

Respondents agreed that additional resources would support further incorporation of sustainability aspects into the formal curriculum in culturally appropriate ways. One participant explained that the current per-student funding model from INAC (now ISC) means that the Cree Immersion programming, which incorporates land-based and language-rich experiential education, receives less funding than classroom-based French immersion programming. Another participant added, “They [INAC] are our funding provider. Without them, we wouldn’t have the opportunity to have education on First Nations communities. ... but we are limited to the amount of resources available to us... just like any other education system in Canada.” While several participants mentioned the administrative and financial costs of these immersion programs are sizeable, resulting in fewer resources being available for other programming, the implicit nature of sustainability education situated within cultural knowledge made this trade-off acceptable to participants.

**Limited operational policies and ad hoc infrastructure upgrades.** Five of the 12 participants agreed that a lack of funding, guidance, or leadership was being provided in their settings to make improvements in the operations and facilities domain, although operational improvements were occurring on an *ad hoc* basis. While there were no overarching sustainability plans or policies to improve sustainability in their schools, school boards, or councils, two participants did describe policies that were impacting energy consumption in their schools. One school had seen a 20% reduction in electricity consumption through improved heating and cooling:

Over the last couple of years by doing things, we bought a new computer software for our heating system that is better able to manage the, you know, shutting the heat down in the evening, maximizing your ventilation system to try and cool the building down at night and also, we are slowly switching over to LED lighting throughout the building.

Another school had developed an energy reduction plan for new school infrastructure with input from the community, which had identified environmental sustainability and energy reduction as key priorities for operational decision-making. It was important to the community that new school infrastructure reflect their values and beliefs and they had noticed buildings in non-Indigenous communities are often sustainable and desired the same:

We had a committee, it was called the school project team and when we were doing our consultation with the architect and folks like that, ... they wanted to make that effort to be as green as possible in what we could provide to students, so that was kind of the mandate and I think that we wanted to be recognized for that as well and I think that big push came because other buildings are recognized for it.

**A lack of sustainability in education research.** None of the participants indicated their schools were involved in research on, or about, sustainability. There was, however, generally positive regard for research and partnerships for research: “With you being here today... we want to see what we can ultimately do for our Aboriginal education, for our community. Maybe what we are doing is something, a model that somebody else can follow...so it’s working collectively and collaboratively.”

**Schools as social capital for community engagement.** Outside of the land-based educational approaches described above, and some partnerships with community’s resource management sectors for initiatives such as community gardens, participants typically described ‘community engagement’ in relation to schools’ broader roles in the community. Several participants related to us that in many First Nations, schools are important community assets and the largest employer per capita. Participants discussed how schools act as focal points for celebrations, training events, medical assistance, and continuing education: “We are the epicenter, ... [the] facility itself houses workshops, presentations, just a broad spectrum of services that benefit the community. I know our community is engaged with what the school is working on.” The school’s central role in First Nations communities increases their potential for encouraging sustainable practices within the community. Three participants noted schools’ ability to leverage this potential to create learning programs that reflect core values, specifically by incorporating and centering locally-relevant practices of environmental sustainability. Capacity-building by networking and collaborating between schools to create and disseminate best practices was also described as very important by three

respondents. Participants described how regional education councils in Treaty Six and Treaty Four are beginning to form communities-of-practice to overcome the under-resourcing in their schools. They described using the community's social capital to enhance learning and placed a higher value on this having formalized sustainability curricula.

## **Discussion: First Nations Schools and the Affordance of Education for Sustainability**

This study provides insight into the ways in which the First Nations-managed schools conceptualize sustainability and navigate systemic and localized barriers to incorporating sustainability in education.

### *Whole-School Domains in First Nations-Managed Schools*

Our analysis, summarized in Table 1, identified a variety of interesting and innovative sustainability initiatives taking place in the First Nations-managed schools that participated in the research. For example, most of the schools were working with regional education councils and governance functions of the school board were enmeshed with community outreach and locally-relevant land-based educational opportunities. School administrators saw themselves as leaders in governing their communities and viewed schools as focal points of community events and decision-making. The results suggest that this governance was a way of life for the participating schools and, although strategic goals are offered through guiding documents (e.g., Assembly of First Nations, 2009), these schools are operating in alignment with sustainable Indigenous lifestyles and worldviews. In terms of sustainability education in the curriculum, most of the schools were offering land-based education, incorporating Elders and Knowledge Keepers, educating “for both worlds,” and providing Indigenous language immersion programs. We also found activity around incorporating sustainability in operations, including energy reduction plans and recycling initiatives, in some schools. Incorporation of sustainability into operations and research were of lower priority for most of the councils who participated in this research. Instead, participants described a focus on community engagement and revitalization of languages and cultural elements through curriculum. While participants perceived that infrastructure upgrades were a worthy goal (without leadership, systematic plans, or secure resources), other goals were more achievable and of higher priority. That said, we did find initiatives occurring on an *ad hoc* basis, suggesting schools' operations were acting somewhat as focal points for sustainability education in these communities. Similarly, Adelman and Taylor (2007) and Kuzich et al. (2015) describe the secondary nature of infrastructural sustainability investments in both First Nations education and in education more broadly.

### *Indigenous Conceptualizations of Sustainability*

The results summarized in Table 1 point to tensions between non-Indigenous and Indigenous conceptualizations of sustainability, including the whole-school lens through which we analyzed our data. In particular, none of the participating schools had developed an overarching sustainability policy or plan to guide sustainability uptake, and these were often discussed by participants as being unnecessary due to the holistic nature of sustainability integration in Indigenous knowledge and ways of living, which corresponds with previous scholarship in the area (Berryman & Sauv e, 2013; Herman et al., 2008; Kovach, 2010).

We found a substantial blending of the different sustainability domains we explored in our analysis, and this research found that First Nations-managed schools are incorporating aspects of sustainability education in three ways: (1) using experiential learning and cultural teachings; (2) involving Elders in programming; and (3) working to retain languages and ways of life that further stewardship of the environment.

The results suggest that community and cultural capital are driving evolution and progress on sustainability goals in the communities in which we collected data, resulting in sustainability education being incorporated in ways that extend beyond school walls. The participants described examples of sustainability education delivered in holistic environments that were unbounded by traditional classrooms and curricular boundaries and often reinforced and supported by local First Nations school councils. The foundational learning for environmental sustainability was also being extended to the community through the incorporation of Elders and Knowledge Keepers in educational programming, and encouraging sustainability by modeling environmentally sustainable behaviours (Beckford et al., 2010; Jegede & Aikenhead, 1999;

Nordström, 2008). In this respect, our study mirrors findings elsewhere regarding synchronicity of Indigenous pedagogies with sustainability education (Battiste, 2009; McGregor, 2012; Munroe et al., 2013).

Many of the participant schools were offering language immersion programs as a priority, reflecting prioritization related to funding barriers and providing a concrete example of how underfunding negatively impacts First Nations-managed schools' ability to more comprehensively integrate sustainability. Participant schools recognized the importance of delivering a culturally-appropriate curriculum to their students despite the fact that delivering a provincially-recognized curriculum was "easier for teachers" in these resource-strapped schools. The interviewees we spoke with described locally designed language immersion and land-based educational programs developed with the support and advocacy of the community.

### *Innovating to Overcome Systemic Barriers*

The primary barriers to incorporating sustainability education in this sample of First Nations school councils and schools included a lack of funding and other resources which limit teachers' pay, as well as the ability to create and offer locally relevant curriculum and programming. Our results support an assertion of systemic racism in Indigenous education systems in Canada, whereby outside priorities and pedagogies are favoured over local ones (Battiste, 2005; Battiste, Bell, & Findlay, 2002; Kuokkanen, 2007). Participants reported that language acquisition and retention, as well as engaging with cultural practices and living on the land were their priorities, but that these foci were not funding priorities for INAC (now ISC). It is worth noting that given the implicit links between language and orientation to land (Rasmussen & Akulukjuk, 2009), improving Indigenous language fluency may foster greater engagement with sustainability in education in First Nations communities. Indeed, the study's participants perceived these activities as inherently sustainable, interdisciplinary, and in need of more support: a finding expressed across numerous studies in First Nations education contexts (Comtassel, 2012; Schmitz, 2012). The link between language and sustainability is acknowledged in treaty education council guiding documents, although no recommendations for environmental or sustainability education are included. For example, in the Assembly of First Nations' (2009) *Community Dialogues on First Nations Holistic Lifelong Learning*, priorities include more involvement of Elders in experiences; speaking First Nations languages in schools; increased opportunities for students to experience and understand the land; and better stewardship of water, air, plants, animals. This last priority includes learning to be aware of the animals, "hearing" them, and "knowing" what is going on with them (Assembly of First Nations, 2009, p. 16-18).

Despite the substantial barriers to sustainability uptake being experienced by the schools in the study, we identified various programs and activities taking place in First Nations-managed schools that are innovative but not well known outside of their respective communities. In some cases, for example, the regional education councils, such as Treaty Six Education Council and Treaty Four Education Alliance, are providing space for innovation and knowledge mobilization. Sustainability-related initiatives appeared to be influenced primarily by the communities' social movements and needs: for example, the walking bus and upcycled bicycle projects were motivated primarily by public health concerns related to high rates of diabetes in First Nations' communities. Thus, the First Nations schools in this study are overcoming systemic barriers by being responsive to, and drawing on, cultural strengths in their communities.

The primary barriers to sustainability uptake in education research and community outreach included participants being constrained by current tasks and not having time or support to develop formal partnerships. As well, the knowledge and experience to engage with Indigenous content and pedagogy had not been modeled as part of educators' pre-service training. Benefits of closing the funding gap for First Nations schools will include sharing the strengths of First Nations educators and communities with public schools and disrupting the inequality of educational outcomes.

Despite these substantial barriers, community advocacy to include more traditional knowledge and learning has resulted in increasing the incorporation of Elders in both in-school and in land-based education. Students in these settings are learning environmentally sustainable practices through language; storytelling and geographic place-names; cultural events and ceremonies; and their teacher's pedagogy. Social health initiatives, which recognize the interconnectedness of health and one's environment and activities as an intrinsically holistic approach to youth development, also improve the environmental sustainability performance of schools and school councils. The central role of First Nations schools in communities suggests that they have the potential to be agents of change in improving local environmental stewardship and

sharing lessons more broadly. By prioritizing the relationship between community, school, and Indigenous epistemologies of sustainability, schools can continue to be agents of change in the community.

## Conclusion

To close, we suggest four key findings with related implications for educators and policy-makers working in provincial and federal contexts. We strongly echo calls made by others (Assembly of First Nations, 2012; Office of the Parliamentary Budget Officer, 2016/ Truth and Reconciliation Commission of Canada, 2015) to close the funding gap in order to improve educational outcomes in First Nations-managed schools generally. The recommendations that follow from these findings were developed through our learning from the schools that participated in our research, as well as with consideration to previous literature. Our key findings include the following:

1. Indigenous schools have unique epistemologies that inform distinct priorities for curriculum and programming around environmental sustainability. First Nations communities recognize the value of teaching students about sustainability, but face barriers in their ability to provide learning opportunities including inadequate funding, exacerbated by external agendas that do not correspond with the needs and priorities of those living on reserve (Battiste, 2012). First Nations seeking to build sustainability education in their schools should draw on and adapt existing initiatives, cultural strengths, and networks in order to develop locally responsive practices that are less resource intensive.
2. Research participants indicated that teacher education programs based on the traditional classroom and certification of individuals do not adequately prepare them to work in First Nations schools. Well established Indigenous pedagogies, and the knowledge and experience of Elders, Knowledge Keepers, and other local people are frequently harnessed to teach sustainable living, but too often this happens only indirectly during culture camps and experiential activities, an underutilization of these valuable community members and resources (Jenkins, 2007). Some of the burdens described by our participants could be eased if the facilitators had meaningful access to opportunities to develop their skills. These opportunities, in turn, would increase the likelihood that they will be recognized as competent and valued instructors by the agencies that oversee them. This recognition would benefit future funding applications and federal policy development and implementation. Moreover, the federal government needs to become more responsive to the value of, and need for, both land-based education and Indigenous language acquisition and retention, and prioritize increasing access to them when developing education-related policy and allocating education-related funding (McCoy, Tuck & McKenzie, 2016; Wiseman, 2016). We therefore call upon pre-service teacher education programs, provincial ministries of education, and teacher specialist associations to develop curriculum, teacher training, and professional development that successfully integrates Indigenous content and pedagogies, including in relation to sustainability (Battiste, 2009; Kulnieks et al., 2014; McKenzie, 2012; Government of Saskatchewan Ministry of Education, 2011).
3. Concerted and continuing efforts are called for across national education systems and amongst policy makers to bridge and reconcile educational policies to new, non-colonial, culturally-appropriate, and inclusive models with ample resources and funding support for all providers (Darling-Hammond & Lieberman, 2012; Fallon & Paquette, 2012; Longboat, 2012; McKenzie, 2012; Sterling & Huckle, 2014). In Canada, recent movements towards reconciliation show potential promise regarding this recommendation.

Understanding the intersection between the underfunding of First Nations-managed schools and sustainability education is extremely relevant to Canada's future. The stalling momentum and limited impact (thus far) of initiatives such as the Truth and Reconciliation Commission and the National Inquiry into missing and murdered Indigenous women, girls and two-spirit people; the federal government's response to Indigenous resistance to the construction of pipelines, resource extraction, and other ecologically damaging activities in Indigenous territories; and the dissolution of Indigenous and Northern Affairs Canada (INAC) to create two new ministries (Crown-Indigenous Relations and Northern Affairs and Indigenous Services Canada or ISC) have damaged relationships between Indigenous nations and the federal government. However, with recent Supreme Court decisions that insist on genuine consultation with Indigenous peoples around resource extraction in their territories, there may be increasing opportunities to

develop mutual accountability and responsibility between Indigenous and non-Indigenous peoples and governments. With growing recognition of the inequities faced by First Nations schools, it is vital that the systemic impact of the underfunding of First Nations education, including in relation to sustainability education, be addressed (Shankar et al., 2013; Wilson & Macdonald, 2010). While federal recognition and compensation has been slow to occur, work has been taking place at regional and provincial levels. A movement toward regional curriculum development and knowledge dissemination, for example, through Treaty Educational Councils and Alliances, has the possibility to mobilize and expand tangible outcomes for students and educators.

As researchers, we acknowledge that expecting school managers to describe formal incorporation of sustainability education teachings across the five whole-school sustainability domains that initially framed the research was difficult given different epistemic conceptions of sustainability and sustainability education. Co-creating a new culturally-appropriate framework for the incorporation of stewardship into the curriculum would provide an opportunity for Indigenous educators to better assess and disseminate their achievements.

School personnel, Elders, and advocates of First Nations-schools should be recognized in their efforts to prepare generations of students for living sustainably, and for their ingenuity in finding innovative ways of overcoming resourcing challenges. Informal opportunities to enhance aspects of sustainability should be built upon to support existing leadership, especially given schools' central roles in First Nations communities. Our recommendations bear application in regional contexts as well. Sharing these innovations, and examples of sustainability leadership among other Indigenous schools, teachers, and education providers could enhance commitment to environmental sustainability across landscapes and cultures, and prompt new partnerships for research and educational delivery.

Provincial education ministries and institutes can also benefit from using Indigenous approaches to sustainability in their curriculum and programming. The interdisciplinary approaches described by our participants have added value for learners: during language and land-based study students learn about geography, language, history, food production, culture, and other subjects while experiencing stewardship firsthand. Additionally, having flexibility in allowing innovative programming, developed with First Nations schools, is another way to move towards decolonization and reconciliation.

## Acknowledgments

This publication draws on research from the Sustainability and Education Policy Network (SEPN), supported by a Partnership Grant from the Social Sciences and Humanities Research Council of Canada (Grant No 895-2011-1025, Principal Investigator Dr. Marcia McKenzie). For more information visit [www.sepn.ca](http://www.sepn.ca). We would like to thank the anonymous reviewers of this paper for their helpful comments, and Nicola Chopin for her contributions to editing this paper.

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