

Barriers and Enablers to the Adoption of Sustainability Initiatives at the Municipal Level in Canada

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Over the past few decades, there has been increasing importance given to local action to achieve global sustainability goals. Cities and human settlements have been recognized as crucial sites for achieving these common goals, demonstrating the value of local action that serves global and local interests. There has, however, been a gap between recognizing the importance of these municipalities and actual action towards sustainability initiatives at the municipal level. This thesis aims to address that gap by examining the barriers and motivators to the adoption of sustainability initiatives at the municipal level in Canada and also to evaluate awareness of the Sustainable Development Goal (SDG) framework of Canadian municipalities. To achieve this aim, a survey was sent out to municipal authorities from Ontario and British Columbia to gather input on knowledge of sustainability concepts and factors affecting the implementation of sustainability initiatives. Two respondents wanted to elaborate on their responses and agreed to be interviewed. Comparison of descriptive statistics and Mann-Whitney U tests were made to analyze the difference between the provinces for some factors. The responses in the open-ended questions and the interviews were subjected to content and thematic analyses. The most prominent factors affecting the adoption of initiatives in a municipality were the municipality's size and financial capacity, to which the former is closely related. It was not so much the size in terms of population but what it represented, such as economic resources, personnel, and technical expertise. Other important factors that emerged from the responses included a favorable municipal environment and the influence of regional, provincial, and federal government. Key individuals and networks also emerged as factors but to a lesser extent. The knowledge of the UN's SDG framework appeared to be low among respondents, while awareness of some sustainability concepts seemed to be present. There was a significant difference between BC and Ontario responses in terms of SDG familiarity and some of the factors affecting the adoption of these initiatives, like key individuals' presence and perceived advantages to adoption. This study contributes to existing research by identifying barriers and motivators to implementing sustainability initiatives in the Canadian context while updating what we currently know about the factors affecting the adoption of sustainability initiatives in municipalities worldwide. This research also suggests that it is important for regional and provincial governments to work together, treating municipalities as partners in decision-making, to advance sustainability.

Keywords: SDG, Sustainability, Municipalities, Local Agenda 21

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1 Introduction

It is estimated that by 2050 two-thirds of the world's population will live in urban areas (United Nations, Department of Economic and Social Affairs, 2019). Even though urban areas are places where there are the most problems related to sustainability, some researchers think that cities will also offer the solutions to all these problems (Homsy & Warner, 2015; Saha & Paterson, 2008). As cities grow and populations change, addressing sustainable development concerns in all local governments (urban and rural) have become increasingly important.

Broadly *sustainable development* is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their needs” (WCED, 1987, p. 43). The critical roles played by local governments were recognized in the Earth Summit of 1992 (Barrutia & Echebarria, 2013; Selman, 1998), which marked the first time that local governments were identified as essential players in promoting sustainable development. Furthermore, a brief chapter in Agenda 21 resulted in developmental progress being made in municipalities worldwide through Local Agenda 21 (henceforth, LA21) (Selman, 1998). LA21 can be defined as “a municipality-led, community-wide participatory effort to establish a comprehensive medium-term strategic plan for tackling environmental, social, economic, and cultural issues” (Barrutia & Echebarria, 2013, p. 43). Although LA21 had some success, it still left a lot to be desired in terms of data measurement, management, and better implementation strategies (Moallemi et al., 2019; Selman, 1998). These challenges are hoped to be better addressed in the implementation of Agenda 2030.

Chapter 3 of Agenda 2030 introduces the Sustainable Development Goals (henceforth SDGs) to the world (United Nations General Assembly, 2015), with the world now focusing on localization. Although the SDGs are global agendas, local governments can play a pivotal role in achieving them (Jones & Comfort, 2020). UN-Habitat released a document titled “Roadmap for localizing the SDGs: Implementation and Monitoring at the sub-national level” in an attempt to guide municipalities with localization. Despite these attempts at “acting locally” and the aspirational aspects of SDG localization, this is still a relatively new concept, and far few studies exist on that topic compared to LA21.

Although scholars and policymakers alike increasingly acknowledge that local governments play critical roles in sustainable development (Gustafsson & Ivner, 2018), there remains much work to translate aspirational global SDGs and targets into reality through local initiatives. Sustainable development has been criticized as being a mere concept (Mensah & Casadevall, 2019) with unclear meanings and implications, especially after the introduction of the Sustainable Development Goals (SDGs) in 2015. This research aims to understand the barriers and motivators to adopt sustainability initiatives at the municipal level in Canada.

1.1 Why focus on local governments?

Based on the Brundtland definition of sustainable development, sustainability initiatives could include a broad range of initiatives from the environmental, economic, and equity dimensions. Examples of initiatives in each dimension include environmentally sensitive area protection, tax incentives for pro-environmental behavior, and anti-gang programs. Therefore, municipal spaces could be ideal places to start implementing the SDGs.

The SDGs have been criticized as ambitious (McArthur & Rasmussen, 2019), with global goals, such as ‘no poverty’ (SDG 1) and ‘zero hunger’ (SDG 2), which may make them seem unattainable. Even specific targets, such as ‘By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.’ (SDG 2, Target 1) (UNDP, 2017) leaves many questions regarding quantifiability and data measurement and management. The means to achieving these ambitious goals are not well defined.

In contrast, many municipalities have plans and strategies for sustainable development. For example, the Region of Waterloo has developed a municipality strategy called ‘Planning for Food-Friendly Municipalities in Waterloo Region’, where one of its plans include ‘Zoning by-laws that can permit temporary farmers’ markets and community gardens in all land use designations and zones’ (Long, 2013). These by-laws could be argued to be much more tangible, realistic, and actionable.

Additionally, it may be easier to implement sustainability initiatives at the local level because the municipality presents complex interrelated problems at a scale where individuals can perceive issues and concerns (Betsill & Bulkeley, 2006; Shaw et al., 2014). This is because one of the most common barriers to pro-environmental behavior is ‘optimism bias,’ where a person believes a problem is too distant to affect them (Markowitz & Shariff, 2012). This could be **physical** distance (e.g., ‘My actions are of no consequence if there are forest fires in the Amazon’) or **temporal** distance (e.g., ‘I do not want to think about how my actions could affect future generations.’). This bias could lead a person to think they have no control over the situation and could result in general apathy. In contrast, a municipal space brings together people, civil society organizations, and businesses (Hoppe & Coenen, 2011). At this scale, it can be argued that some problems and their interlinkages can be easier to perceive and to take ownership. For example, members of ‘Waterloo Region Nature,’ an NGO based in Waterloo, Ontario, noticed that the city of Kitchener’s Tall Buildings’ Urban Design Guidelines reflected a drive for urban intensification and a push for more walkability. However, it came at the cost of ecological damage in the form of bird strikes on tall building windows during migration (Suffling, 2020). As a result, hawk silhouettes and sheer curtains were used by residents of these tall buildings to prevent birds from striking their windows (Suffling, 2020).

This ability to perceive the synergies and trade-offs at the local scale makes it easier to overcome optimism bias.

Once there is recognition of what is occurring locally, the structure of municipal government facilitates the ability of local authorities to interact with citizens, businesses, civil society organizations (public and private sectors), and other stakeholders and reach a more consensual solution regarding sustainability problems (Barrutia & Echebarria, 2015; Betsill & Bulkeley, 2006; Evans et al., 2006). To meet sustainable development aspirations depends on these very stakeholders' everyday activities (Barrutia & Echebarria, 2015; Solecki et al., 2013). Higher levels of government are not as close to the citizens as municipalities are (Global Taskforce of Local and Regional Governments, 2019; Barrutia & Echebarria, 2015), enabling municipal governments to be aware of local problems first-hand. Municipal governments endeavor to include citizen participation in all municipality activities through public hearings, social media, and other means that higher-level governments may not be able to do as effectively.

1.2 What is the current interest in sustainability in Canada?

Over the past few decades, cities have shown more importance to sustainability and climate change solutions to battle increasingly complex challenges (Yi et al., 2017). In Canada, there seems to be a growing interest in finding solutions to sustainability issues (Stuart et al., 2016). To aid cities in their sustainability efforts, various international and national programs have emerged to offer them technical assistance, financial assistance, and a general platform for climate change engagement (Baker et al., 2012). The International Council for Local Environmental Initiatives (ICLEI), a voluntary network of local governments, is one such network eminent in Canada (Yi et al., 2017). ICLEI in Canada boasts over 400 member municipalities working together to share knowledge and solutions related to local government sustainability (Kariem & Jackson, n.d.). Some authors even consider ICLEI to provide the most important platform for local sustainability initiatives (Betsill & Bulkeley, 2004; Yi et al., 2017), and so it is surprising that despite the considerable commitment to urban sustainability claimed by Canada, very little literature exists that study adoption of sustainability initiatives by local governments. Most studies that do exist only seem to consider certain aspects of sustainability like financial sustainability or climate change mitigation.

More recently, even networks initially established for other reasons have begun to include support for sustainability initiatives. For example, the Federation of Canadian Municipalities (FCM) was initially established to facilitate communication between the federal government and municipalities to help them deliver better services to their citizens (Federation of Canadian Municipalities, n.d.). Although participation in the network is entirely voluntary, FCM has various funding programs, available such as the 'Green

Municipal Fund’ and ‘The municipalities for climate innovation program’ to help municipalities advance their sustainability aspirations.

1.3 Research problem

More than 150 local governments, in Ontario alone, have already devised sustainable community plans (SCPs)-which are plans to achieve environmental, economic, and social goals to combat climate change (Cairns & Clarke, 2015) and other sustainability issues; however, not all of them have successfully managed to implement them, and there exists a gap between planning and implementation.

This research aims to understand the barriers and motivators to adopt sustainability initiatives for municipalities in British Columbia and Ontario. For the purpose of this thesis, adoption is considered to be the initial steps towards implementation, which go a little beyond just the creation of plans. The theoretical framework used to guide this research is the *Diffusion of Innovation Theory* in an organizational context. This research might also offer new insights into the diffusion of innovation in organizations’ research. In order to identify and explain the factors which may influence the adoption of sustainability initiatives in a municipality, research objectives were set accordingly. The SDG framework was thought to be an essential guideline for directing municipalities in their sustainability efforts.

This thesis has the following objectives:

- Identify the drivers and barriers to sustainability efforts at the municipal level
- Identify the types of sustainability initiatives that have been implemented at the municipal level
- Determine the knowledge and awareness of SDGs and sustainability by municipal staff and elected representatives

1.4 Thesis Format

Chapter 2 of the thesis will be an in-depth literature review that will summarize what we currently know about barriers and motivators to sustainability and climate change initiatives at the local level, followed by insights from innovation literature. Chapter 3 will describe the methodology followed to achieve the aims of the thesis. The results obtained from the data collection will be presented in Chapter 4, followed by a discussion of the results in Chapter 5. The final chapter will summarize the implications of the thesis and provide suggestions for future work.

2 Literature Review

2.1 Introduction

This literature review covers three areas of literature. It begins with a history of LA21 literature and a summary of the findings from municipal governments' adoption of LA21 processes worldwide. Then, the literature on sustainability and climate change in relation to municipal action is discussed. Finally, the diffusion and adoption of innovation theories are also covered in the context of municipalities, and the contributions of the thesis are discussed.

2.2 History and Outcomes of Local Agenda 21

The concept of sustainable development emerged due to environmental concerns about the planet's natural resources being depleted (Echebarria et al., 2018; Pezzey, 1992). The United Nations Environment Commission, headed by Gro Harlem Brundtland, created the study "Our Common Future" in response to the same environmental concern (WCED, 1987). This work marked a critical moment in the process of institutionalizing the sustainable development concept, as well as introducing what would become the most generally recognized definition of sustainable development: "Sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs." (WCED, 1987, Chapter 2).

In 1990, the United Nations Development Program (UNDP) released the Human Development Report, which summarized the educational, health, and economic conditions of people in various countries (Bhanojirao, 1991). From this report arose the need to integrate the principles of human growth and sustainable development (Echebarria et al., 2018). Thus, the focus was moving away from purely environmental concerns to include equity and economic concerns.

The United Nations Conference on Environment and Development was held in Rio in 1992 to identify the best sustainability approaches (Echebarria et al., 2018). The conference's key outcomes were Agenda 21 and its local government edition, Local Agenda 21 (LA21). Agenda 21 was envisioned as a non-binding, innovative, and internationally organized action plan involving action at the international, national, regional, and local levels (Echebarria et al., 2018). LA21 was included in Agenda 21's Chapter 28. The LA21 proposal was revolutionary because it included a new management strategy with novel approaches to municipal planning, including community engagement and strategic planning (Echebarria et al., 2018; Guerra et al., 2019). Another critical component of LA21 was moving away from purely environmental goals to recognize that environmental problems were more complex than previously imagined, and broader

systemic and institutional changes also need to be addressed. Selman and Parker (1999) describe it as a shift from “local government and environment” to “local governance and sustainability.”

LA21 resulted in some local governments making attempts to include sustainability programs and introducing sustainability into policy and planning research to guide their local sustainability efforts (Saha, 2009). However, LA21 seems to have had varying levels of success in different countries and local governments (e.g., Guerra et al., 2019; Yıldırım et al., 2017; Rahman & Yusof 2020; Diaz-Sarachaga, 2019; Eckerberg & Dahlgren, 2007; Kelly & Moles, 2002, Zan & Ngah, 2012, Selman 1998). Some countries like Sweden and UK claim to have had more success in the implementation of LA21 (see Eckerberg & Dahlgren, 2007; Selman 1998) in their cities than some other countries like Ireland, Malaysia, Brazil, and Portugal, which had limited success in integrating LA21 processes into formal municipal procedures (see Kelly & Moles, 2002; Zan & Ngah, 2012). One reason for the limited success in integration seems to be the lack of trust between the various stakeholders involved (Kelly & Moles, 2002; Zan & Ngah, 2012; Guerra et al., 2019). Some other barriers to the success of LA21 include structural and economic constraints (Guerra et al., 2019; Kelly & Moles, 2002; Zan & Ngah, 2012). Some of the aims of LA21 are even considered to be impossible to measure (Selman 1998). Although there is no consensus on the success of LA21, researchers seem to agree that LA21 planted the seed for bottom-up and participatory governance (Guerra et al., 2019; Selman 1998; Kelly & Moles, 2002; Eckerberg & Dahlgren, 2007; Rahman & Yusof, 2020; Echebarria et al., 2018), which is considered by most to be its most significant achievement.

The UN General Assembly began negotiating the post-2015 development plan in January 2015. At the UN Sustainable Development Summit in September 2015, the process resulted in adopting the 2030 Agenda for Sustainable Development, including 17 SDG (United Nations Department of Global Communications, n.d.). The world then began focusing on localizing the SDGs. Although there was no formal end to LA21, they seem to be generally considered the localized SDGs’ predecessors. The SDGs were seen as a sign of recommitment to the sustainability principles introduced by LA21. However, given the suggested mixed success of LA21, it is essential to identify the drivers and barriers and the current state of sustainability implementation at the local level to understand better how the SDGs may be met by 2030 through local actions.

2.3 Insights from LA21 in Practice

There exist far more studies on Local Agenda 21 than the localized SDGs. This difference could be because it has already been almost 30 years since the introduction of LA21, and the SDGs were just introduced five years ago. Another reason for this could be because LA21 processes had no formal end date (also, municipalities were encouraged to make long-term plans), although some researchers noticed that the fervor

of adoption and implementation declined after some years (e.g., Kern et al., 2007; Eckerberg & Dahlgren, 2007). Most research on LA21 is from European countries (Calabuig et al., 2009). From previous research on LA21, various factors affecting local sustainability activities were identified, and they offer valuable lessons for the adoption of future initiatives. These factors have been grouped into municipality characteristics, municipality resources, good leadership, communication and networks, and perceived advantages to adoption.

2.3.1 Municipality Characteristics

A review of LA21 literature highlights common factors that limited the integration of LA21. Some of these factors were size, culture, political orientation, sustainability tradition, and citizen participation. They are discussed below and are considered to be characteristics of the municipality.

A common factor mentioned by studies on local government adoption of LA21 is the municipality's size. The size is often used as a proxy for local government resources (Echebarria et al., 2018). Kern et al. (2007), in their study of diffusion of LA21 in Germany, found that larger municipalities tended to be forerunners when it came to the adoption and implementation of LA21 processes because they had sufficient financial resources. This factor has also been mentioned in many other studies (e.g., Calabuig et al., 2009; Hoppe & Coenen, 2011; Sancassiani, 2005; Barrutia et al., 2007). However, the effect of size needs to be interpreted with caution, as size measured by population alone does not seem to affect a municipality's adoption of LA21 processes in all the cases mentioned above. Instead, size often represents a complex mix of hard-to-measure factors, such as complexity of knowledge or diversity (Barrutia et al., 2007).

Hoppe and Coenen (2011) refer to the social and environmental culture within municipalities in the Dutch context as a motivator for adopting LA21 processes in local governments. In a similar vein, Kern et al. (2007) noted that Berlin was a forerunner in adopting LA21 practices despite budget deficits. One of the reasons for this, suggested by Kern et al. (2007), was that Berlin was the center of the 'alternative scene' characterized by student rebellions after reunification. Due to this reason, the city was in a transitional phase with much support for adopting new policies. This social and environmental awareness among the municipalities' citizens seemed to have affected the adoption of policies according to sustainability concepts. Furthermore, Echebarria et al. (2018) performed a systematic literature review of 109 articles dealing with Local Agenda 21 activities worldwide. They noted that 'sustainability culture' within the municipality was a significant driver for implementing LA21 processes.

Closely related to sustainability culture was the political orientation of the municipality. Political ideology provides a value system through which people view the world around them (Gromet et al., 2013). The relationship between political leaning and views on sustainability and the environment has been examined

by multiple researchers in the past, who all seem to agree that such a relationship exists (e.g., Thompson Jr & Gasteiger 1985; Gromet et al., 2013; Sancassiani, 2005; Garcia-Sanchez & Padro-Lorenzo, 2000). Garcia-Sanchez and Padro-Lorenzo (2008) studied the determinant factors for the advancement of LA21 in European municipalities and found a negative relationship between right-wing ideologies and the promotion of LA21 processes. They suggested in their research that this could be because right-wing ideologies support policies that focus on economic conditions more than environmental and equity issues. Furthermore, Sancassiani (2005) found that the left-liberal government promoted 72% of LA21 processes in Italy.

It was also suggested by Echebarria et al. (2018) in their review of LA21 literature that when municipalities have a history of community participation or of implementing sustainability initiatives, they are more inclined to adopt future initiatives. According to the theory of absorptive capacity, an organization's ability to absorb new knowledge depends upon its previous knowledge base (Cohen & Levinthal, 1990). Therefore, in the context of municipalities, their sustainability tradition has been suggested to help the municipality adopt newer sustainability initiatives in the future. For example, Eckerberg & Dahlgren (2007) found that in Sweden, many local authorities adopted goals more far-reaching than national goals and their traditional environmental policies seemed to have helped them in this regard.

Finally, many researchers consider citizen participation to be the most crucial element in LA21 adoption (Barrutia & Echebarria, 2010; 2013; Evans et al., 2006; Kelly & Moles, 2002; Guerra et al., 2019; Moallemi et al., 2020). In fact, LA21 is understood as “a municipality-led, community-wide participatory effort” (Barrutia & Echebarria, 2013, p. 43). For effective citizen participation, there needs to be trust among various actors in the society. Moallemi et al. (2020) state an example in literature wherein the development of LA21 processes in Malaysia depended on external contractors and less communication with the public. This dependence led to less community buy-in, with the public not being aware of what needs to be done and eventually to poor adoption and implementation. This lack of trust was also an impediment to the successful implementation of LA21 in some parts of Ireland, as noted by Kelly and Moles (2002). Evans et al. (2006) note in their study also that when the relationship between civil society and the local government is positive and strong, those local governments have a better chance of achieving their sustainable development goals.

2.3.2 Municipality Resources

Financial factors play a significant role as barriers (e.g., lack of funds) or drivers (e.g., financial incentives, cost-savings) for adopting LA21 at the municipal level. Sometimes these financial resources also determine the presence of other resources.

Municipalities depend upon the property tax model to provide finances for most of their needs. However, researchers have found that financial support and other resources from higher levels of government are essential for facilitating the adoption of LA21 practices in municipalities (e.g., Barrutia & Echebarria, 2010; 2015; Hoppe & Coenen, 2011; Hoppe et al., 2014; Calabuig et al., 2009; Echebarria et al., 2018). Calabuig et al. (2009) examined the variables that determined the development of LA21 over a period of 15 years in various countries to create a framework to explain its development. They note that supramunicipal support, specifically in economic support, favors the development of LA21 processes at the local scale. Barrutia and Echebarria (2010; 2015) suggest that this is because financial support from higher levels of government could reduce a municipality's perception of financial risk.

There were instances when municipalities were motivated by savings in cost to adopt initiatives. In their case studies, Betsill & Bulkeley (2004) noticed how some municipalities like Denver and Newcastle, enticed by cost savings, adopted energy-saving initiatives like retrofitting energy-efficient lighting. This saved them millions of dollars every year (Betsill & Bulkeley, 2004). The municipalities sometimes used these savings to adopt other initiatives.

Hoppe & Coenen (2011), in their investigation of local sustainability performance in the Netherlands, found that lack of funding sometimes leads to a deficit in personnel and lack of compliance and standards. This deficit was problematic because lack of staff capacity and lack of training resources was also a commonly stated barrier in the literature (Echebarria et al., 2018; Sancassiani, 2005). In their literature review of 109 LA21 articles, Echebarria et al. (2018) mention that demand for financial and human resources is a constant need in countries worldwide.

2.3.3 Good Leadership

Good leadership has been found to be favorable to the adoption of LA21 processes. This leadership could be in the form of the presence of a champion for the innovation or through some leadership exhibited by higher levels of government, as discussed below.

Several studies have emphasized that the presence of key individuals and good leadership by specific people has influenced the adoption of LA21 in municipalities (e.g., Evans et al., 2006; Betsill & Bulkeley, 2004; Hamlin & Gurrán, 2015; Barrutia & Echebarria, 2011; Hoppe & Coenen, 2011). Evans et al. (2006) performed an in-depth study of 40 European cities to understand the institutional and social factors that affect sustainable development policy and practice. They found that mayors played an essential role in driving the sustainability agenda. Moreover, they also found that when a key individual leaves their position, the momentum of policy and action adoption is slowed. In one particular city in Majorca, a former Mayor was proactive in pushing sustainability actions, and when he left office, it is unclear whether these

actions continued (Evans et al., 2006). Barrutia and Echebarria (2011), who studied the adoption of LA21 in the Basque region in Spain, confirmed that individuals with sufficient charisma helped spread LA21 processes in their municipalities.

Ever since local governments were recognized to be essential players in the fight against unsustainable practices in the Rio Conference of 1992, some researchers have advocated for a bottom-up approach to policy/ decision-making (e.g., DeLeon & DeLeon, 2002; Capano et al., 2012). Advocates for the bottom-up approach suggest that change should be initiated from the lowest level, and municipalities should be provided with the right conditions to create change. However, in a study by Stuart et al. (2016), who analyzed municipality planning documents in four mid-sized municipalities in Ontario to see how sustainability policies were incorporated into the planning documents, it was found that sometimes federal and provincial legislations were very particular regarding how some facets of municipality planning must be carried out and did not give municipalities much room to innovate. Other researchers have also suggested that municipalities' regulatory restrictions could be a barrier to sustainability and climate change initiatives (e.g., Calabuig et al., 2009; Preuss, 2007; Evans et al., 2006).

However, regional and national legislation has also positively affected sustainability policy implementation at the local level. According to Homsy and Warner (2015), top-down direction and order helped the USA implement policies that otherwise would not have been implemented by local governments, such as cleaning up pollution in some cities. Thus, it seems that higher-level governments should guide without being too restrictive. Instead, they should provide autonomy to local government (Evans et al., 2006). At the same time, as risk aversion is often a barrier to innovation adoption (Barrutia & Echebarria, 2011), higher-level government needs to provide support so that local governments do not perceive these initiatives as risky endeavors. Higher government levels could empower municipalities by providing subsidies, grants, recognition, and rewards (Echebarria et al., 2018).

2.3.4 Co-creation, Networks, and Communication

Barrutia and Echebarria (2010) examined municipalities in the Basque region in Spain and found that a particularly relevant factor in municipalities embracing LA21 practices was co-creation. As Barrutia and Echebarria (2010, p. 452) explained, co-creation means actors “sharing concerns, learning from each other, and innovating together.” These actors were municipalities and various levels of governments, and they suggested that co-creation could be facilitated through networks. Sometimes municipalities gain other benefits from such networks and communication. Betsill & Bulkeley (2004) studied how transnational networks, such as CPP (*Cities for Climate Protection*), foster policy change. They suggested that municipalities are motivated to join networks because of financial gains, political resources, and legitimacy

for their climate policies, more so than for sharing knowledge and resources. However, in both studies, networks and communication have been considered important in adopting sustainability processes.

Furthermore, in their literature review of 109 LA21 articles, Echebarria et al. (2018) found 19 cases where networks significantly helped in the diffusion of LA21. Echebarria et al. (2018) suggest that municipalities sometimes receive the same benefits they might receive from higher levels of governments through networks. These benefits include financial benefits, ideas, and support.

2.3.5 Perceived advantages to adoption

Municipalities may be motivated to adopt initiatives because they may perceive different advantages to adopting them. However, these perceived advantages may be very specific to the municipality and may have different meanings to different municipalities based on size, citizen attitude, political orientation, etc.

Reputation has been recognized as one of the most important motivators for public organization behaviors. A few researchers have studied how reputation affects municipality behaviors and decisions (e.g., Maor, 2015; Bjørnå & Salomonsen, 2016; Wæraas et al., 2015; Walker, 2006). Municipalities are faced with constant pressures to describe why they are an excellent place to live or work or retire than other municipalities and why businesses and tourists should choose their municipalities instead of others (Wæraas et al., 2015). Thus, they may view the sustainability initiatives to give them some competitive advantage over their current practice (Walker, 2006). Municipality reputation also has the potential to attract more residents and change the population trends of the city.

Population growth was a factor mentioned by Calabuig et al. (2009) that could result in municipal action to implement policies in line with sustainability. Many municipalities, especially small municipalities, desire to grow their populations and make accommodations for additional citizens. According to Homsy and Warner (2015), population growth and change in density could provide some form of internal motivation for municipalities to adopt more sustainable practices. Hanna (2005), in their research, studied the planning process in two Canadian cities in British Columbia and how it evolved to meet the needs of the community. They state one example, wherein the Canadian city of Tofino, in order to meet the housing needs, the local authorities were contemplating the formation of a local housing board. This consideration was also to facilitate the creation and maintenance of affordable housing (Hanna, 2005). As more development was taking place, it also prompted the local officials in that city to preserve their greenspace and come up with solutions for increasingly complex problems (Hanna, 2005). These were changes caused by a changing population.

Citizen engagement, according to Coenen (2009) and others (Barrutia & Echebarria, 2011, 2013, etc.), may be the most distinguishing feature of LA21 and one of the key factors driving its success. Adoption of LA21

requires citizens to participate in the decision-making process. Thus, municipalities may be interested in LA21 processes as it may help them induce citizen participation. This potential may be of interest to municipalities since citizen participation is strongly associated with good governance (Stewart, 2006).

2.4 Other Studies on Sustainability at the Local Level

Studies related to LA21 offered insights into the various factors that affect a local government's ability to implement sustainability initiatives successfully. A few other studies looked at sustainability in local governments without particular reference to LA21. Additionally, some studies exclusively looked at factors that affected a municipality's adoption of climate change actions and policies. In other words, they only looked at the environmental dimension of sustainability. These studies also provided similar insights into the various factors affecting the adoption of sustainability initiatives at the municipal level.

Liao et al. (2020) classified sustainability planning in municipalities into two categories: 1) those trying to take a more integrated approach by considering all dimensions of sustainability; and 2) those choosing a functional area and focusing on that (e.g., resilience, climate change adaptation, financial sustainability, etc.). Research on sustainability activities in local governments also seems to follow that pattern, with some studies considering sustainability as a whole unit but some other studies examining specific functional areas. Several studies try to identify the barriers and motivators to *climate action* (e.g., Stuart et al., 2016; Burch, 2010; Carlsson-Kanyama et al., 2013; Robinson & Gore, 2005). These studies provide similar insights as those observed from the LA21 studies, such as positive effects of financial support to municipalities, knowledge, regional cooperation, and less stringent regulations from higher government levels.

Many of these other 'sustainability studies' also provided similar insights as LA21 studies. Hoppe and Coenen (2011) studied the factors influencing local sustainability performance in the Netherlands. Their study also identified many factors, primarily within a municipality (e.g., size, capacity, presence of a complex knowledge mix, contacts and partnerships, presence of a full-time expert, and a local catalyst) by a thorough literature review of practices in the Netherlands. Likewise, Saha (2009) used several political culture, structural, intergovernmental, and economic variables to understand the factors affecting sustainability activities in the USA and found that political culture was critical. Specifically, cities with unconventional communities, such as younger, more skilled, and professional-employed populations, non-traditional family households, unmarried-partner households, and higher female labor force participation, were doing well at fostering sustainability. This is similar to what some LA21 studies had found previously regarding city culture (e.g., Kern et al., 2007; Echebarria et al., 2018). There were also some other findings from the study by Hoppe and Coenen (2011). They noticed that in the Netherlands also, local authorities

associated sustainability with climate change mitigation and adaptation, which was also the case noted by some other researchers like Saha and Paterson (2008) and Liao et al. (2020).

Saha (2009) also found that the state's position (higher-level government in the USA) is a significant factor in sustainability scores. State growth management initiatives and planning mandates are crucial instruments in inspiring sustainability policies based on the overwhelmingly positive impact of state participation in local sustainability planning efforts (Saha, 2009). This finding is similar to LA21 studies that encourage leadership from higher levels of government.

In the earlier years of local action, Saha (2009) found that some cities seem to be further along than other cities in terms of sustainability and called for comparison across cities to understand better what characteristics of a city make it suitable for adopting initiatives. More recently, there have been some studies that have looked at how different municipalities address sustainability plans. Prior research evaluating local governments' sustainability initiatives assumed that those with more sustainability programs are more likely to boost sustainability conditions than those with fewer programs (e.g., Portney, 2003). In contrast, Ji and Darnall (2018) suggest that some local governments follow an exploitation plan that focuses on a small number of sustainability issues that provide short-term economic benefits (for example, recycling and internal government energy use). Likewise, in their study of 651 municipalities in the USA, Liao et al. (2020) also found that most municipalities often adopted short-term goals in an ad hoc manner without integrating the three dimensions of sustainability. This ad hoc adoption of initiatives was also noted by Saha and Paterson (2008) and Berke (2016). Alternatively, other local governments prefer to follow an exploration approach, tackling a broader range of sustainability concerns and using a broader range of policy instruments to do so (Ji & Darnall, 2018). With their broader emphasis, these governments are more likely to resolve more nuanced sustainability problems affecting environmental quality, as well as community well-being and social inclusion (Ji & Darnall, 2018). So, Ji & Darnall (2018) suggest that it is not the number of initiatives but what initiatives are being adopted and how they are being adopted that matters. These researchers' work also suggests a disconnect between how sustainability is presented on paper and how it is implemented in real life.

Saha & Paterson (2008) found that many local communities' sustainability activities do not include social justice and equity. The majority of these programs are focused on improving local economic opportunities and protecting the environment. This has also been noted by few other researchers (i.e., Opp & Saunders 2013; Champagne 2020). Individual sustainability-related efforts should not always be equated with a broader commitment by local governments to sustainable growth concepts (Saha & Paterson, 2008). Many forms of policies could have been implemented for purposes other than achieving sustainability objectives. Other factors included the cost-effectiveness of such programs, political expediency, or policies that were

seen as good planning practice (Saha & Paterson, 2008). These other ‘factors’ are similar to some of the findings from the review of LA21 literature.

Typically, sustainability plans serve as a roadmap for a vision for local growth. However, there is still the question of how the preparation of plans will lead to action. Local sustainability plans are typically strategic in nature and lack regulatory authority. This can result in a sustainability strategy that is never implemented. This gap between theory and practice was noted by Saha (2009) and 11 years later by Liao et al. (2020), suggesting that we may still need more insight into why these plans are not being put into practice and what is stopping municipalities.

2.5 Studies after the introduction of the SDGs

More recently, studies on the implementation of SDGs provide additional insights into sustainability at the local level. Governments are still trying to ‘translate’ global goals to their national contexts (Koch & Krellenberg, 2019), and this translation is crucial as not all goals and targets are of equal importance to every country. In local governments, the translation of national goals to the local context is taking place. There seems to be a particular focus on SDG 11 (making cities safe, inclusive, resilient, and sustainable) with its 10 targets and 15 indicators (e.g., Koch & Krellenberg, 2019; Vaidya & Chatterji 2020; Almeida et al., 2018). However, the goals are set up so that pursuing one goal may lead to meeting other SDGs, and ultimately all goals are relevant at the local level (Zinkernagel et al., 2018).

Even with the SDGs, researchers are identifying a gap between theory and practice (Krantz & Gustafsson, 2021). Once again, there seems to be a lot more effort to adopt and integrate the SDGs into municipal plans in Europe, especially Sweden, since Sweden has traditionally been a forerunner in adopting environmental policies and practices (Krantz & Gustafsson, 2021). Krantz and Gustafsson (2021) note that the Swedish case provides an example to highlight that the SDG framework provides an opportunity for municipalities to understand and implement sustainability in a comprehensive manner. Given the aspirational goals in the SDG framework for achieving sustainability, it is important to determine how familiar municipal authorities are with the SDGs in Canada.

2.6 Theoretical Framework

Sustainability in municipalities has been studied using various theories such as the ‘Resource-based view of sustainability engagement’ (Barrutia & Echebarria, 2015), ‘Sustainability theory’ (Saha & Paterson, 2008), the ‘Isolated-Supported-Connected’ (ISC framework) (Echebarria et al., 2009). However, a theory that appeared to consider several interesting variables and has been used by a few researchers to study the adoption of initiatives in municipalities is *the adoption and diffusion of innovation theory* in an organizational context.

2.6.1 Diffusion of innovation in organizations

The diffusion of innovation theory, initially conceptualized by Rogers, attempts to explain the circumstances that increase or decrease the likelihood of adopting a new product, process, or practice (Rogers, 2004, Chapter 1). This idea, product, or practice, which is perceived as new by the unit of adoption, is broadly referred to as the ‘innovation’ (Rogers, 2004, Chapter 1). The unit of adoption can be an individual, a group of individuals, or an organization. An organization is defined as a stable system of individuals who work together to achieve common goals through a hierarchy of ranks and labor division (Rogers and Agarwala-Rogers, 1976). By this definition, a municipality can be defined as an organization since municipalities have a hierarchy of decision-making with the presence of councils and committees. They also have common goals through a strategic plan, community plan, etc.

According to Rogers (1983, p. 11), innovation is an idea, practice, object, or process *perceived as new* by the unit of adoption. However, Greenhalgh et al. (2005) argue that this definition of innovation is not very useful in an organizational setting due to organizations’ complex nature. Greenhalgh et al. (2005, p. 26) argue that any organizational change becomes an innovation if the traditional definition is applied in an organization. Thus, based on a comprehensive literature review of over 500 innovation-related research sources, Greenhalgh et al. (2005, p. 28) provide a new definition for ‘innovation’ in organizations as follows: innovation is a broad set of behaviors, routines, ways of working along with any administrative technologies and systems that are:

- 1) Perceived as new by a critical set of stakeholders
- 2) Directed at creating ‘improvement’ when compared to current practice
- 3) Implemented through planned, coordinated actions by individuals, teams or organizations.’

However, this definition is specific to health service organizations. Therefore, this thesis draws on elements from both Rogers (2004) and Greenhalgh et al. (2005) and defines a sustainability innovation in the context of municipalities as follows: processes, ideas, behaviors, routines, and ways of working that are perceived as new by municipal stakeholders, create sustainability improvements compared to current practice, and are implemented through planned, coordinated actions by elected officials and municipal staff.

By this definition of innovation, sustainability initiatives such as a micro-hydro project, energy efficiency measures, etc., could be considered ‘innovations’ in a municipal setting, because the adoption of such initiatives calls for the municipality to adopt behaviors, products, etc., which might not have been previously implemented. Although not truly innovations, as they have existed for decades, they could be perceived as new by municipal stakeholders. They could be directed at improving current conditions by way of becoming more cost-effective, energy-efficient, etc.

Finally, it is crucial to make a particular distinction between *diffusion of innovation* and the *innovation process*. Straub (2009) described diffusion theory could take on a **micro** or a **macro** perspective. The **micro** perspective attempts to explain the *innovation process* or the stages that an individual or another unit of adoption, such as an organization, goes through while deciding to adopt or reject an innovation (Straub, 2009). The **macro** perspective attempts to explain the spread or *diffusion of innovation* over time. This spread could be between individuals or other adoption units, such as communities, cities, or organizations (Straub, 2009). This distinction was made because these terms will be used in later discussions.

2.6.2 A Brief History of the Innovation process in Organizations

When diffusion research in organizations began to gain traction, researchers simply applied the models and methods for researching innovation that had previously been developed for individuals to study organizations (Rogers, 2004, p. 407). Then diffusion research evolved to consider the process within the organization instead of merely examining the variables that made an organization more innovative or less innovative (Rogers, 2004, p. 408; Greenhalgh et al., 2005). After this, research on organizational diffusion evolved further to consider more factors, but these two sub-traditions of diffusion research are still widely used today to consider the adoption and spread of innovations in organizations.

2.6.3 Organizational Innovativeness

The initial research on organizational innovativeness shed light on the characteristics of innovative organizations. Many of these traits were found to be similar to those of innovative people (Rogers, 2004, p. 408). Larger companies, for example, were found to be more innovative, just like people with higher incomes and social status (Rogers, 2004, p. 408). However, certain organizational traits have no human equivalents. For example, organizational structural characteristics like **system openness** (defined as the degree to which members of a system are connected to other individuals outside the system) and **formalization** (defined as the degree to which an organization emphasizes following rules and procedures) were found to be positively and negatively related to organizational innovativeness, respectively (Rogers, 2004, p. 408).

Figure 2.1 represents the independent variables that were associated with organizational innovativeness. The degree to which a system's power and control are centralized in the hands of a limited number of people is known as **centralization**. Traditionally, centralization has been shown to reduce organizational innovativeness (Rogers, 2004, p. 412). The degree to which an organization's members possess a reasonably high level of experience and competence is called an organization's **complexity**. It has usually been positively associated with innovation (Rogers, 2004, p. 412). The degree to which an organization stresses its members to adhere to rules and procedures is known as **formalization**. Formalization has been

found to have a negative relationship with the adoption stage of innovations (Rogers, 2004, p. 412). The degree to which the units in a social structure are related by interpersonal networks is known as **interconnectedness** (Rogers, 2004, p. 412). With a higher degree of network interconnectedness, new ideas will flow more easily among an organization's members. This variable has a positive relationship with organizational innovativeness. The level of uncommitted resources available to an organization is known as **organizational slack**. This variable has a favorable relationship with organizational innovation (Rogers, 2004, p. 412). These variables could be related to the various factors found by previous research to affect the adoption of sustainability initiatives by municipalities (e.g., formalization could be restrictions upon municipalities imposed by higher levels of government, interconnectedness could be facilitated through networks, and so on).

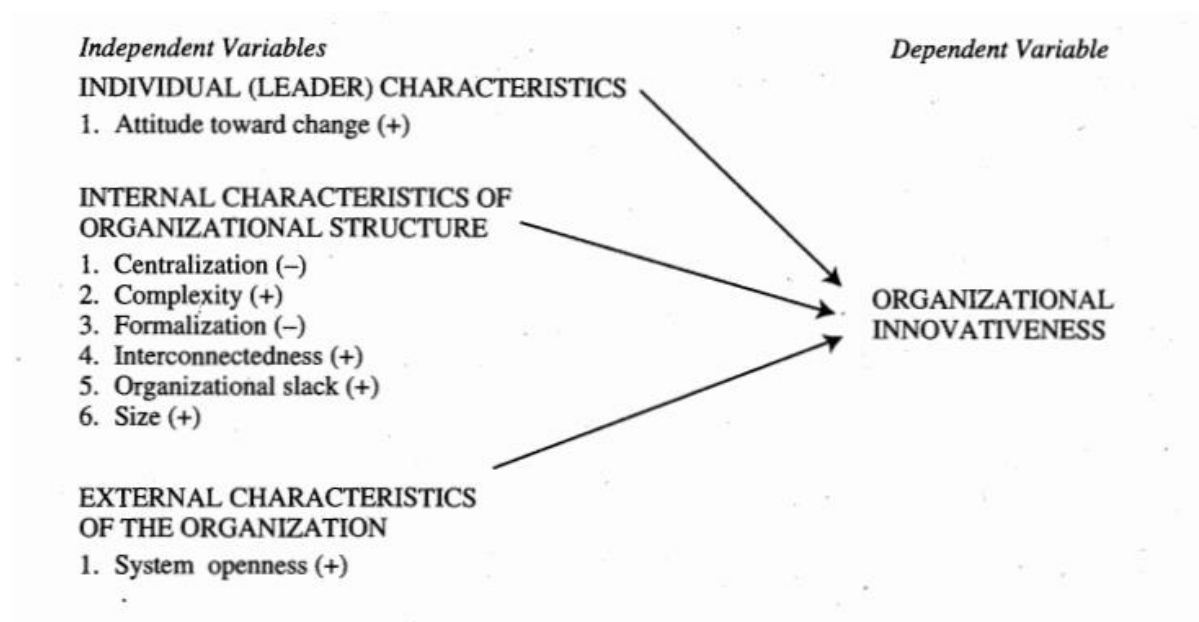


Figure 2.1 Independent Variables Related to Organizational Innovativeness (Rogers, 2004). A plus (+) sign indicates a positive relationship between the characteristic and organizational innovativeness, while a minus (-) sign indicates a negative relationship.

2.6.4 Innovation Process in Organizations

With the publication of Professor Gerald Zaltman and colleagues' book (1973), 'Innovations and Organizations,' a significant turning point in the history of research on innovation in organizations occurred. This work inspired researchers to not merely consider adoption alone but also implementation (Rogers, 2004, p. 417). So, the innovation *process* in an organization gained more prominence.

The innovation process is divided into five stages, two of which are in the initiation subprocess and three of which are in the implementation subprocess, as shown in Figure 2.2.

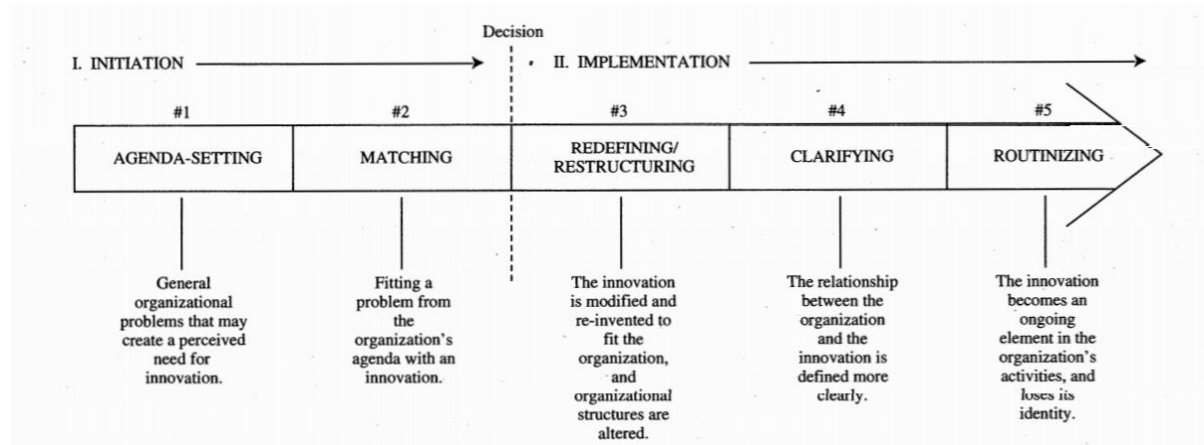


Figure 2.2 Stages in the Innovation Process in Organizations (Rogers, 2004)

The **initiation** subprocess includes all of the knowledge collection, conceptualization, and preparation for adopting an innovation leading up to the adoption decision. The **implementation** subprocess includes all the events, actions, and decisions involved in bringing the innovation into practice. The dotted line that distinguishes the two phases of initiation from the stages of implementation is the decision to adopt.

The **initiation** subprocess consists of agenda-setting and matching. **Agenda-setting** occurs when a problem is recognized in the organization and a need for change is recognized (Rogers, 2004). For example, changing populations in a city may create a need to find solutions for affordable housing. Sometimes, the solutions precede the problem in a process called ‘opportunistic surveillance’ whereby one or more individuals identify specific innovations that could help the organizations (like cost-saving measures) even when there is no immediate need for the innovation. This process could take several years. In the **matching** stage, members in the organization assess the feasibility of the innovation. They also try to assess how well the innovation fits the problem and the organization’s ideals (Rogers, 2004).

The **implementation** subprocess consists of redefining/restructuring, clarifying, and routinizing. In the **redefining/ restructuring stage**, the innovation is modified to closely fit the organizational needs and structure (highlighting that an organization’s structure is an important consideration for implementation). In some cases, the organization’s structure is changed to accommodate the innovation (Rogers, 2004), such as creating a sustainability department in the municipality. At the **clarifying** stage, the innovation is already in widespread use in the organization (Rogers, 2004). Misunderstandings and unwanted side-effects of the innovation are addressed in this stage. During the **routinizing** stage, the innovation adoption process is

complete as the innovation becomes a part of the organization's daily activities (Rogers, 2004). If many organization members were involved in the adoption process, sustained implementation would likely be more successful (Rogers, 2004). Sometimes innovations are discontinued even in the routinization stage. For example, the city of Toronto removed bike lanes in Scarborough just four months after introducing them due to driver complaints (Adler, 2020). This is an example of an innovation being discontinued at the routinization stage.

2.6.5 Municipality studies that have used the diffusion of innovation framework

The following provides a chronological overview of the use of diffusion of innovation to study municipality innovation related to sustainability.

Damanpour and Schneider (2006) studied the adoption of different innovations by 1200 local government organizations in the USA. They examined the effects of environmental, organizational, and top managers' characteristics on the initiation, adoption decision, and implementation of innovations. In other words, they examined some variables of organizational innovativeness on the process of adoption. They found that there was a beneficial impact of an organization's economic health on adoption. Other researchers have also shown the relationship between the presence of sufficient resources and the adoption of sustainability initiatives in a municipality, as previously mentioned. Damanpour and Schneider (2006) also found that organizational factors (such as the municipality's economic health and complexity of knowledge within the municipality) are more influential predictors of innovation *adoption* than the environmental or individual demographic factors of managers. They also found that the manager's attitude towards the innovation had a considerable effect on the adoption of different innovations by local government organizations.

Walker (2006) studied the adoption of product and process innovations across 120 municipal governments in the UK. In that research, it is suggested that public organizations like municipalities respond to internal and external forces to adopt innovations. Walker (2006) stresses the importance of organizational size, key individuals' presence, the local residents' disposition, and the need to achieve a competitive advantage for adopting innovations.

Kern et al. (2007) used the macro perspective to the diffusion of innovation theory, which explains the spread or diffusion of innovation over time (Straub, 2009), to study the diffusion of LA21 processes in Germany and the driving forces behind them. They found that local governments with greater economic capacity, located near pioneering cities in states that financially supported LA21 and established knowledge transfer agencies (like networks), were more likely to start LA21 processes. Pioneering cities tended to be large cities with sufficient financial and other resources in their case as well.

Damanpour and Schneider (2009) also studied the adoption of 25 innovations by 625 local governments in the USA and added more context to their previous research. Their findings imply that urban society operates in dynamic environments that may promote innovation. For example, population growth can provide local governments with a more extensive tax base, allowing them to invest more in innovation. They also found some government officials' characteristics affected innovation adoption, as suggested by their previous research in 2006. Some other commonly mentioned factors, such as size and resources, positively affect innovation adoption. Environmental factors, such as development and political/legal restrictions, and organizational factors, such as structure and culture, were suggested to influence innovation's *implementation* more than its adoption. The two studies by Damanpour and Schneider (2006; 2009) suggest perhaps that some demographic characteristics and attitude variables of municipal decision-makers may be worth considering under municipality characteristics.

Barrutia and Echebarria (2011) referenced innovation adoption theories in examining the factors affecting the adoption of LA21 in Italy. Their research found that resources from networks, the propensity of citizen participation, and risk aversion were significant factors in adopting LA21. Their research also highlighted the presence of champions as a significant factor in the adoption of innovation by local governments.

What is clear from these few studies that exist in terms of local government and their adoption of innovations and policies is that findings on the factors affecting adoption are not very consistent. As Greenhalgh et al. (2005) imply, diffusion research owes many of its findings to quite context-specific variables. However, given the study's nature, adoption of sustainability initiatives in local governments, such limitations are a constant (Garcia-Sanchez & Prado-Lorenzo, 2008). Contexts change through the years, and many other external variables may also influence the adoption of specific initiatives. It is only through the collection of observations at various levels and in various contexts that general conclusions can be drawn (Garcia-Sanchez & Prado-Lorenzo, 2008). Therefore, more research is needed to understand the factors affecting the adoption of sustainability initiatives in various contexts.

2.7 Summary of Barriers and Drivers

By examining barriers and drivers to innovation, sustainability initiatives, and more specifically, climate change initiatives, it appears as though the common factors affecting innovation can be classified broadly into 1) Municipality characteristics 2) Resources 3) Good Leadership 4) Communication 5) Advantages to adoption.

Common municipality characteristics that affect the adoption of initiatives include culture, sustainability tradition, political orientation, citizen participation. Availability of financial, human, and other resources seem to affect the adoption of initiatives positively. Good leadership exhibited by key individuals within

the municipality and by higher levels of government also positively influences the adoption of initiatives. Networks facilitate the communication of knowledge and ideas and present funding opportunities to municipalities to encourage initiative adoption. Finally, perceived advantages to adoption, such as increasing their municipality's reputation and credibility and increasing population growth within the municipality, may motivate municipalities to adopt more initiatives.

When looking at these factors from an innovation standpoint, the factors could be subdivided into 1) Internal organizational characteristics, 2) External characteristics 3) Innovation characteristics, as shown in Figure 2.3. It is also possible that there may be other unidentified barriers and motivators, and which may be very context-specific in some cases.

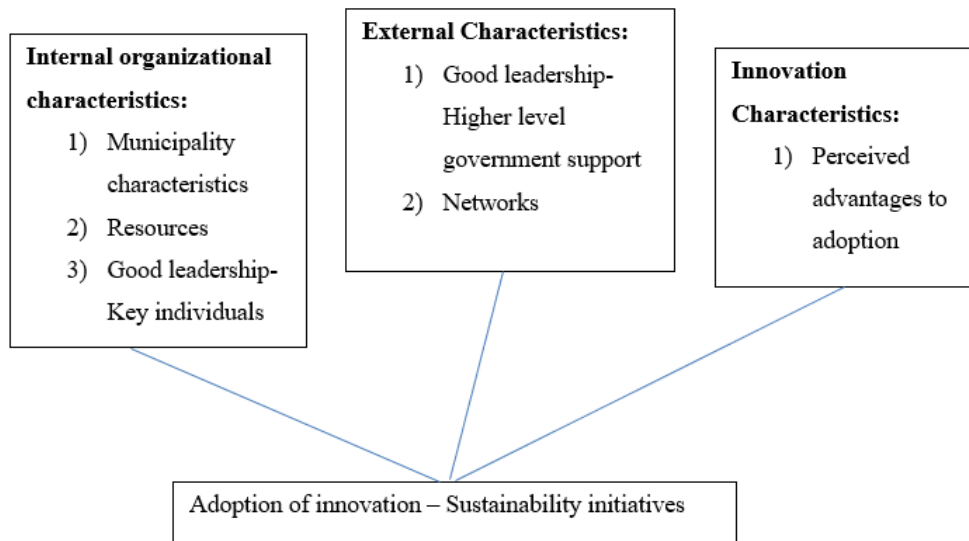


Figure 2.3 Conceptual diagram of the various factors affecting adoption of sustainability initiatives at the municipal level. Adapted from Barrutia and Echebarria (2011) and Damanpour and Schneider (2009)

2.8 Contributions of this thesis

This thesis contributes to an understanding of sustainability efforts in the municipal context and the development of innovation in organizations literature in the context of municipalities. A conceptual model of the various factors considered is presented in the previous section. It is important to note here that all the factors mentioned may also be interrelated in more than one way. These interconnections are not represented in the diagram because they could be unique to the municipality situation. As Greenhalgh et al. (2005, p. 100) states:

Adoption (assimilation) in organizations is a highly complex and difficult-to-research process involving multiple decisions by multiple actors. Barriers to adoption often occur at several levels and influence both one another and the overall innovation capacity of the system. Except in a minority of circumstances, organizations should not be thought of as rational decision-making machines that move sequentially through an ordered process of awareness–evaluation–adoption–implementation. Rather, the assimilation process should be recognized as complex, iterative, and frequently beset by shocks, setbacks, and surprises.

This research is valuable because no such comprehensive study has been done across Canadian provinces to examine the barriers and motivators to sustainability initiatives. Other researchers also call for more research into the barriers and motivators to sustainability efforts at the municipality level to further understand local sustainability practices (e.g., Echebarria et al., 2018) and to update current knowledge.

Furthermore, this study examines different sized municipalities across the entire provinces of Ontario and BC, upon which studies rarely focus. Most studies of this nature usually happen in a relatively homogenous context, such as one region (e.g., Barrutia & Echebarria 2010; 2015). The study also addresses the gap between theoretical literature on sustainability and practical initiation (first stages of the adoption process) of these plans.

2.9 Conclusion

This chapter shows the extent of the literature on local governments' involvement in sustainability. However, the environmental bias in adoption of sustainability initiatives appears to persist in many countries. There is also a scarcity of studies of this nature in Canadian municipalities. The barriers and motivators to adopting sustainability initiatives specific to the Canadian context may be uncovered through this study. An understanding of these factors would be the first step to overcoming such barriers. This study also updates knowledge of barriers and motivators to sustainability initiatives in municipalities worldwide and contributes to existing organizational innovation literature, specifically in the case of municipalities.

3 Methodology

This thesis aims to explain the barriers and motivators that affect the adoption of sustainability initiatives at the municipal level in Canada. This chapter explains the research design employed to achieve this goal, a description of the data collection procedures, and the statistical tests and qualitative analysis techniques used to analyze the data. As a reminder, this thesis has three objectives.

- 1) Identify the drivers and barriers to sustainability efforts at the municipal level
- 2) Identify the types of sustainability initiatives that have been implemented at the municipal level
- 3) Determine the knowledge and awareness of SDGs by municipal staff and elected representatives

3.1 Research Approach

‘Research approach’ refers to plans and strategies for the research that includes collecting data, analyses, and interpretation of results (Creswell, 2014). This research used a mixed-methods approach, which involves collecting both qualitative and quantitative data with the assumption that both types of data will provide a complete understanding of the research problem (Creswell, 2014). This has been used in other studies of innovations in organizations, even in the context of municipalities (e.g., Yauch & Steudel, 2003; Damanpour & Schneider, 2009). More specifically, this research used the ‘convergent parallel mixed-methods approach’ in which a researcher collects both qualitative and quantitative data roughly around the same time and integrates the information in the interpretation of the results (Creswell, 2014). The quantitative data was used to generate descriptive statistics, and the qualitative data provided rich information and insight into why respondents answered the way they did.

A survey was chosen because: 1) this method is commonly applied to other studies of this nature; 2) it is possible to gather opinions and responses from a far more significant number of municipalities compared to other methods such as interviews. The survey was targeted at municipal staff (i.e., mayors, councilors, and city staff), as they were expected to be the most knowledgeable about the state of sustainability initiatives. Their opinions are valuable as it helps see municipality issues through the eyes of the municipal staff.

The survey was comprised of 19 questions, 7 of which contained text-entry boxes to collect open-ended responses. Questions were related to general demographics like age, sex, level of education and roles in the municipalities, knowledge of SDGs, environmental attitudes, types of initiatives implemented, and factors believed to be affecting the adoption of initiatives. The survey was reviewed and tested by a council member

in an Ontario municipality. The factors that were included in the survey are summarized in Table 3.1. These factors were mainly derived from other literature that studied similar phenomena, such as Echebarria et al. (2009; 2018), Barrutia and Echebarria (2011), Saha (2009), and Damanpour and Schneider (2009).

Table 3.1: The factors affecting sustainability implementation in municipalities that were used to form the survey questions

Factor	Barrier / Driver
Municipality Characteristics	Name (for size and political leaning) Value for citizen engagement Sustainability culture Sustainability tradition Perception of risk Current Capacity
Resources	Financial resources Incentives as resources Training and Human resources
Good Leadership	Key Individuals Higher levels of government
Communication and Networks	Presence of networks Types of networks Reasons for joining networks
Perceived advantages to adoption	Reputations and credibility Gaining recognition and awards Individual learning benefits

It was hypothesized that these factors would affect the adoption of initiatives in both BC and Ontario. At the end of the survey, municipalities were given a list of 11 initiatives to choose from (adapted from the work by Saha and Paterson (2008)) and asked which ones their municipalities had implemented. They were also given a space to mention other initiatives. Since the survey generated considerable interest in the respondents, two of the respondents reached out to provide more information through phone calls. After obtaining the participants' consent, the calls were recorded and transcribed. This research received ethics approval.

3.1.1 Geographical Scope

Since there are 5,162 municipalities in Canada, it was considered best to focus on two provinces and choose respondents from municipalities within the provinces. Ontario was chosen as the first province of interest due to its large size. It has been noted that Ontario and British Columbia (BC) adopted a considerable amount of sustainable energy policies in the 2000s (i.e., Hoberg & Rowlands, 2012). British Columbia was chosen as the second province of interest. Other reasons for selecting these two provinces include differences in political environments at the regional level. As Robinson and Gore (2005) put it, municipalities in Canada are “creatures of the provinces,” and they often look up to provincial mandates for direction. Hydro-electricity-rich British Columbia and automobile-industry-dependent Ontario were considered because they provide considerably different contexts.

3.1.2 Survey Administration

The survey was created on Qualtrics XM, an experience management platform. The link to the survey on Qualtrics was then generated. Between October 2020 and November 2020, recruitment emails were sent out to mayors, councilors, and city staff in chosen municipalities from Ontario and BC. No formal sample size calculation was performed; however, it was decided that it was necessary to reach out to more than 10% of the municipalities in each province to gain the desired number of responses. This decision was taken to account for non-respondents. Additionally, multiple people from each municipality were emailed to account for varying levels of experience and to get perspectives from elected officials and municipal staff.

It was decided that a random sample of municipalities from each province would be chosen to recruit respondents. However, there may have been some biases in choosing the respondents because each of the chosen municipality’s websites was visited to obtain the respondents’ email addresses. Some municipalities had the email addresses of municipal authorities listed in elusive places, making it difficult to find them. When a municipality did not have a functioning website, it was removed from the list. The choice of respondents could have caused another potential source for bias, as they were chosen from departments that were more likely to participate (e.g., from the planning department or engineering department) and, to a lesser extent, from some other departments (e.g., from the finance department).

Thus, approximately 100 municipalities from Ontario and 100 in BC were chosen, and 5-6 municipal authorities from each municipality were mailed the survey. Five to six municipal authorities in various positions (mayors, councilors, or city staff) were chosen, hoping to get at least one response from the chosen municipality. This decision meant that approximately 500 emails were sent to 100 municipalities in Ontario, and approximately 500 emails were sent to 100 municipalities in BC.

The chosen individuals were sent an email explaining the nature of the study with the link at the bottom of the page. The recruitment email is attached in Appendix A. The link led the individuals to the consent page, where they could choose whether they wished to participate or not. The survey is attached in Appendix C, and the consent information in Appendix B.

3.1.3 Interviews

The study results also contain input from two interviews with two survey respondents who reached out to provide more information over a telephone call. The interview was unscripted and unstructured, and the participants freely expressed their opinions on the survey on matters that were not addressed in the survey. With permission from the participants, the call was recorded and transcribed. Since the respondents reached out themselves without any prompting, it was considered publicly available information. This information provided more qualitative information for the results. In discussing the results, the interview participants were coded with the abbreviation IN 1 and IN 2, and interview insights are discussed where applicable.

3.2 Data analysis

The analysis of the data took place in two phases. First, the quantitative analysis was performed using SPSS (Statistical Package for Social Sciences). Then the qualitative analysis was performed on the open-ended questions and the interviews. The data analysis process will be described in the following sections.

3.2.1 Quantitative analysis

Before any analysis was performed on the data, the data was downloaded and cleaned. Some of the data were removed based on the following criteria:

- 1) If the response duration was less than 200 seconds (3.3 minutes), the response was deemed unusable and was removed. This decision was made because the approximate time to respond to the survey was estimated to be 10 to 14 minutes.
- 2) If the response was less than 20% complete, it was deemed unusable.
- 3) If the response was submitted by persons other than mayors, councilors, or city staff, it was removed. It was the intention of this survey to obtain the opinions of municipal authorities and no one else. Sometimes the survey was forwarded to someone else in the municipality who responded in place of the person to whom the survey was emailed.
- 4) Since multiple people from each municipality were emailed, in some cases, more than one response per municipality was obtained. When this situation arose, all valid responses were considered while determining the factors that might affect the adoption of sustainability initiatives in the municipality except for the consideration of *size, participation in ICLEI or FCM, initiatives adopted*, and for

determining if the *municipality had an office or person for sustainability*. In those cases, it made sense only to consider one response per municipality. The Kish-Grid procedure determined the unique response that was considered in those exceptions. This method has been initially used to select one responded in a household randomly (Kumar, 2013). After a household is chosen, the interviewer creates a list (sampling frame) of all the people in the house who are qualified to participate in the interview. This list includes the person's name, gender, and age (Kumar, 2013). Each qualifying member is given a unique number after the listing is completed. After that, a member is selected for the interview based on a randomized response table. In this case, the responses were ordered first in alphabetical order and then in terms of the response date and time. The Kish-Grid table was referred to select one response from the municipality for the *size, participation in ICLEI/ FCM, initiatives adopted*, and determining whether the *municipality had an office or person* to avoid double counting. For all other survey questions, all responses were considered as they were the opinions of the respondent in question. The Grid used is included in Appendix D.

3.2.1.1 Statistical Analysis

This research's objectives included identifying factors seen as barriers and motivators to adopting sustainability initiatives at the municipality level in Canada. Some of these factors were identified from literature that was applied in different contexts and different regions. To see how these factors are relevant in the Canadian context, descriptive statistics with frequency tables were generated for most of the questions using SPSS.

Descriptive statistics were generated for the responses and presented as frequency tables and bar graphs. Since most of the data were ordinal and nominal, the central tendency measure was the median where it applied. Even though the mean is not a measure of central tendency usually considered for ordinal data, it was still presented in some cases to gain more insight from the data. To measure the variability in the data, interquartile ranges (henceforth, IQR) were calculated for the ordinal data where appropriate. The Standard Deviation (henceforth SD) was also considered to gain more insight into the data's variability.

It was hypothesized that there would be differences between provinces in factors such as municipality characteristics (sustainability culture, sustainability tradition, concerns expressed by citizens, and value for citizen engagement), perceived advantages to adoption (enhancing the reputation and credibility of the municipality, gaining recognition and awards for sustainable municipalities), the SDG familiarity, the importance given to resources from higher levels of government, presence of leadership in the form of key individuals and the number of initiatives adopted by the two municipalities. When these differences are not

easily seen through the descriptive statistics and box blots, a non-parametric test (Mann-Whitney U test) is used to see the differences between the provinces.

To test if the responses from Ontario and BC were different from each other for some of the ordinal measures (when differences were not easily seen through the descriptive statistics), Mann-Whitney U Tests were performed (for a confidence interval of 95% and significance level of 0.05). The Mann-Whitney U Test is a non-parametric alternative to the T-test used to examine if there is a significant difference between two independent samples (Milenovic, 2011).

In a Mann-Whitney U Test, all the observations for both samples are combined into one group and ranked from lowest to highest. After that, the two samples are divided, and the assigned ranks for each group are added together. It can be concluded that two groups are not from the same population if the sum of one group's ranks is sufficiently larger than the sum of another group's ranks (Ji, 2011) or if the mean rank of one group is sufficiently larger than the other group. After running the Mann-Whitney U Test in SPSS, the effect size can be determined using $r=|z|/\sqrt{N}$ (Tomczak & Tomczak, 2014). According to Cohen (1988, p.10), "the larger this value [effect size], the greater the degree to which the phenomenon under study is manifested." This statement indicates that a larger effect size points to a greater difference between the groups. A general rule of thumb is that an $r=0.1$ (approximately) represents a small effect, $r=0.3$ (approximately) represents a medium effect, and $r=0.5$ and above represents a large effect. Using the sum of ranks or mean rank, it is also possible to say which group exhibits a particular characteristic to a greater extent (e.g., Ontario shows greater importance to enhancing the municipality's reputation and credibility than BC).

The Mann-Whitney U Test has three assumptions that need to be met (Hart, 2001):

- There must be **one dependent variable** that is measured at the **continuous** or **ordinal** level.
- There must be **one independent variable** that consists of **two categorical, independent groups**
- The observations in one group must be independent of the observations in the other group

There is an additional condition that needs to be met, which, however, depends upon the data collected: whether the distributions of values for both groups have the same or different shape. This condition could slightly alter the interpretation of the Mann-Whitney U test. Under the assumption of similarly formed distributions, any variations between groups revealed by the Mann-Whitney U test can be attributed to a significant difference of medians (Hart, 2001). However, if the distributions are different, we only describe the differences between the groups and cannot check if the medians are significantly different.

3.2.1.2 Municipality size

Respondents were asked to specify their municipalities' names so that two other factors could be computed: the municipality's size and the municipality's political leaning. The municipality's size was given one of five values depending upon the population in the municipality and the density of the population. This value was given because, according to Statistics Canada, the defining feature between urban and rural municipalities is the number of inhabitants and their population density. Urban population centers have a population of at least 1000 with a density of 400/sq km. In 'urban municipalities,' there are three different sizes of population centres, namely,

- small population centres, with a population of between 1,000 and 29,999
- medium population centres, with a population of between 30,000 and 99,999
- large urban population centres, consisting of a population of 100,000 and over (Statistics Canada, 2018)

Some survey respondents satisfied the population criteria but did not satisfy the density criteria. Therefore, municipalities were further divided into small municipalities with high density and small municipalities with low density. Table 3.2 explains the code assigned to each municipality based on size.

Table 3.2: Classification of municipalities by size as suggested by Statistics Canada (2018)

Municipality type	Population (number of people) & population density (number of people/ sq. km.)	Assigned code
Rural	Population < 1000 Density < 400/ sq. km.	1
Small population centre	Population >1000 Density < 400/ sq. km.	2
Small population centre	Population >1000 Density > 400/ sq. km.	3
Medium population centre	Population > 29,999 Density > 400/ sq. km.	4
Large population centre	Population > 99,999 Density > 400/ sq. km.	5

3.2.1.3 Political environment

Political ideology provides a value system through which people view the world around them (Gromet et al., 2013). Several studies have shown a relationship between political leaning and views on sustainability and the environment (Thompson Jr & Gasteiger 1985; Gromet et al., 2013; Mocca, 2017; Opp & Saunders, 2013; Damanpour & Schneider, 2009). Canada has federal ‘Members of Parliament’ (MPs) and provincial ‘Members of the Legislative Assembly’ (MLAs) elected for each electoral district. To find the municipality’s political leaning, a choice had to be made to either consider the leaning of the federal MPs or the provincial MLAs (or MPPs as they are called in Ontario) of the riding (electoral district) to which the municipality belonged. Upon inspection of the division of power between the federal MPs and the provincial MLAs (Intergovernmental Affairs, 2018), it was decided that the leaning of the provincial MLAs would be considered as their decisions seemed to affect the everyday life in municipalities. The provincial party’s leaning to which the MLAs of the previous five terms (~2003-present) belonged were identified to obtain the municipality’s political leaning. The municipality was assigned the leaning of the most frequently occurring party (or the mode).

In Ontario, the major provincial parties are:

1. Progressive Conservative (Centre-right)
2. New Democratic Party (NDP) (Centre-left)
3. Liberal Party (Centre/ Centre-left)

In BC, the major provincial parties are:

1. BC Liberal party (Centre-right)
2. BC New Democratic Party (BC-NDP) (Centre-left)
3. Green party (Left)

3.2.2 Qualitative Analysis

The qualitative analysis was conducted on both the open survey responses and on the two interviews.

3.2.2.1 Content Analysis

Content analysis is a research method that can be applied in both a qualitative and a quantitative manner (Seuring & Gold, 2012). Shapiro and Markoff (1997, p.14) call it “any methodological measurement applied to text (or other symbolic materials) for social science purposes.” In this thesis, content analysis was used to analyze the responses to the smaller text entry questions.

Content analysis consists of two levels of analyses, frequently described in the literature: Analyzing the manifest content and the latent content. In manifest content analysis, the researcher stays close to what the informants of the content actually say, describing what is obvious and readily available through the text (Bengtsson, 2016). Latent content analysis tries to interpret the text and uncover any underlying meaning the text might have (Bengtsson, 2016). For this research, manifest content analysis was performed on the short text entry questions, which mostly involved one line or phrase replies.

Content analysis also involves breaking up larger pieces of text into smaller categories to answer the research questions. With content analysis, it is possible to qualitatively describe the data and count the instances of particular categories, thereby quantifying the text (Vaismoradi et al., 2013). The frequency of occurrence of a particular category, when counted, might suggest its importance or significance in this case.

The approach to performing content analysis is usually associated with two modalities: The inductive and deductive approaches (Vaismoradi et al., 2013). As Vaismoradi et al. (2013) describe, there is no previous theory informing the coded categories in the inductive approach, and they are all derived from the text itself. The deductive approach is used to test a previously known theory. Thus, a mix of deductive and inductive approaches was used for this research by examining the text first for factors frequently mentioned in literature and then for frequently occurring categories. Each response was read multiple times to count the number of times a particular category was mentioned presuming that the number of mentions would suggest the category's importance. There were four short text entry questions—the first one asking the respondent to specify their role in the municipality if they chose city staff. The second one asked the respondent to specify if their municipality had an office/ person or any other position in charge of implementing such initiatives. The third question asked municipal authorities in what networks their municipalities participated. Finally, there was a space for municipalities to mention any initiatives they may have adopted and not listed.

3.2.2.2 Thematic Analysis

Thematic analysis is a form of a descriptive qualitative approach to data analysis. Thematic analysis has been described as “a method for identifying, analyzing and reporting patterns (themes) within data.” (Vaismoradi et al., 2013, p. 400). Thematic analysis allows for a mixture of manifest and latent analysis. Unlike content analysis, the researcher does not have to choose before starting the process (Vaismoradi et al., 2013). It is a more flexible methodology. The researcher is advised to consider both manifest and latent content.

In some cases, the respondents chose to give more detailed responses. At the end of the survey, the respondents were given a text entry box to freely express their thoughts and anything else they might like

to discuss in the survey. Some of the respondents took the time to discuss, at length, their thoughts on the survey and sustainability initiatives in their municipality. For those responses, thematic analysis was performed. The respondents to the open-ended text-entry question at the end of the survey were coded with the abbreviation ON to indicate they were from Ontario and BC to indicate that they were from British Columbia.

Braun and Clarke (2006) suggest a six-step process to analyze the content in the data. These steps are not necessarily linear, and there is room to move back and forth while performing the analysis. The steps are as follows: becoming familiar with the data; generating the initial codes, searching for themes; reviewing the themes; defining the themes, and generating the report.

There were primarily three large text entry questions. The first one asked the respondent why their municipalities preferred to ‘wait and see’ when sustainability initiatives were considered. The second question asked the respondent to specify why they chose to join any sustainability networks to which they may have belonged. The third one, as previously mentioned, asked the respondent to express any thoughts they had on the survey. In addition to that, the two interviews were also examined using thematic analysis. The entire survey is attached for reference in Appendix C. In thematic analysis, the number of respondents who mention a particular theme (and not the number of mentions of a particular theme) could signify its importance.

3.3 Limitations of the research methods

The study design had some limitations, as follows:

- 1) Most of the survey questions were perceptual questions, which means respondents provided their perception of their municipality and situation. Even some of the attitude and socio-demographic questions were self-reported. This input could be valuable but, at the same time, could sometimes be inaccurate.
- 2) Many of the variables were measured using just one question to minimize response time, survey length, and survey drop-offs. This format could potentially cause errors if the respondents thought that the questions were phrased ambiguously. However, care was taken to ensure that the questions were as straightforward as possible.
- 3) The content and thematic analyses were performed using only one coder. In standard practice, it is usually desirable to have more than one coder so that the coder’s perception does not influence the data’s interpretation. Furthermore, it is recommended that at least one of the coders should not have developed the protocol (Lacy et al., 2015). Due to constraints in resources, this practice was not followed.

- 4) Since the number of municipal authorities surveyed is small compared to the entire number of municipal authorities in both provinces, the findings may be limited to the sample of respondents. However, valuable insights on barriers, enablers and the state sustainability may still be gained by this method.
- 5) Finally, respondents who were more likely to respond to the survey were chosen. This choice might have caused some bias in the responses as a more environmentally conscious population might have been unintentionally chosen.

4 Results

This research aimed to understand the level of sustainability and identify barriers and motivators to sustainability initiatives at the municipal level in Canada. This chapter will present the results of the survey and the interviews. As a reminder, this thesis has three objectives.

1. Identify the drivers and barriers to sustainability efforts at the municipal level
2. Identify the types of sustainability initiatives that have been implemented at the municipal level
3. Determine the knowledge and awareness of SDGs and sustainability by municipal staff and elected representatives

In order to meet these objectives, the opinions of municipal staff (mayors, councillors, and city staff) from municipalities in Ontario and BC were gathered. The results will be discussed using the conceptual diagram in Chapter 2. While addressing a particular objective, the objective number will be mentioned before the discussion.

1.1 Response rates

There were 206 usable responses from the survey, 97 (47.1%) from Ontario and 109 (52.9%) from BC. The number of responses from each province corresponds to a response rate of 19.4% and 21.8% in Ontario and BC, respectively. Thus, the overall response rate was 20.6%.

Since multiple people from each municipality were emailed, certain municipalities had more than one person answering the survey. Even if municipalities had more than one person answering for them, all responses were kept. This is because the results are considered as opinions of the municipal staff. However, it is acknowledged that there were 67 unique responses from Ontario and 73 unique responses from BC, allowing classification of the municipalities in terms of size and political leaning. There were 205 complete responses for the municipality's name. One respondent did not specify the municipality's name but mentioned the province.

There were 70 respondents who gave some comments on the open-ended text-entry space at the end of the survey. In addition to that, insights were gained from two interview participants, which are integrated into the results.

4.1 Socio-demographic and Municipal roles of staff

Not all the respondents answered all the questions. Out of the 199 respondents (out of 206 valid responses) who answered the question regarding age, 52 participants indicated they were between 46 and 55 years old. This response represents the largest portion (25.2%) of the participants. The ages of the other participants ranged between 26-35 (18.4%), 36-45 (24.3%), 56-65 (17%) and 66+ (11.7%). There were no participants aged between 18 and 25. Out of the 199 respondents who answered the question on sex, 115 (55.8%) were male, and 83 (40.3%) were female. One respondent chose ‘other’ but chose not to specify (Tables in Appendix D).

Most respondents (66%) indicated possessing a bachelor’s or a master’s degree (**Error! Reference source not found.**). The seven respondents who indicated ‘other’ specified that they possessed one of the following: A college diploma, some university courses, or that they are currently enrolled.

Table 4.1: Summary statistics for the levels of education of the survey respondents

Level of Education	Frequency	Percent
High school graduate, diploma, or the equivalent (for example, GED)	5	2.4
Some college credit, no degree	17	8.3
Trade/technical/vocational training	10	4.9
Associate degree	4	1.9
Bachelor’s degree	76	36.9
Master’s degree	60	29.1
Professional degree	15	7.3
Doctorate degree	5	2.4
Other, please specify	7	3.4
Total Valid	199	96.6
Missing	7	3.4
Total	206	100.0

The respondents were also asked to specify their roles in the municipality, which were as follows: 28 (13.6%) respondents were mayors; 37 (18%) respondents were councillors, and the rest of the 141 (68.4%) respondents were city staff. When respondents mentioned city staff, they were provided with a box that asked them to specify their role in the municipality. A summary of the responses to this question is provided in Table 4.2.

The largest number of responses for the city staff are from planning departments. This may be because these respondents may have had their email more available on websites. Also, most of the responding

municipalities did not have a dedicated sustainability or climate change staff, with the planners handling the sustainability or climate change staff's duties. In some cases, the emails were forwarded to the planning staff as they were considered more 'knowledgeable' on the subject.

Table 4.2: Respondents' Municipal Roles

Department	Types of roles mentioned	Frequency of mentions
Municipal Government- Elected Officials		
N/A	Mayors	28
N/A	Councillors	37
Municipal Staff		
Planning	Policy and Planning Planning and Development Planning and Engineering Planning and Environmental sustainability Building and Planning	38
CAO	Chief Administrative Officer	21
Engineering (Excluding Planning and Engineering)	Engineering Department Public Works	16
Clerk's Department	Clerk/ Deputy Clerk Legislative Services Administrative Services	12
Sustainability (excluding Planning and Environmental Sustainability)	Sustainability Manager/Supervisor Sustainability Team Sustainability Division	9
Environment Department (Excluding planning and environmental sustainability)	Environmental Manager Environmental Risk Manager Environmental Coordinator Energy Manager	9
Development officers (Excluding planning and development and economic development)	Development and Strategic Initiatives Development Officer	7
Parks and Recreation	Parks Manager Parks, Recreation and Heritage department Manager of Facilities and Parks Recreation Manager	6
Finance and Economic Department	Financial Director Economic Development Officer	6

Unspecified senior positions	Director of Operations Senior Staff	5
Corporate services	Corporate Services	4
Deputy Mayor	Deputy Mayor	3
Climate change	Climate Change Officer Climate Change Coordinator Climate Change Specialist	3
Social and Community Development	Director of Community Services Social Services Administrator	2

4.2 Responding municipality characteristics

Most of the municipalities that responded (90) were small municipalities, with 35 having low density (<400 people per sq. km.) and 55 having a higher density (>400 people per sq. km.). The rest of the respondents were from rural (12), medium-sized (18), and large (19) municipalities (Table in Appendix D). One municipality could not be classified. Even though the municipalities were chosen randomly across each province, most of the responses were from southern Ontario and the southern parts of BC.

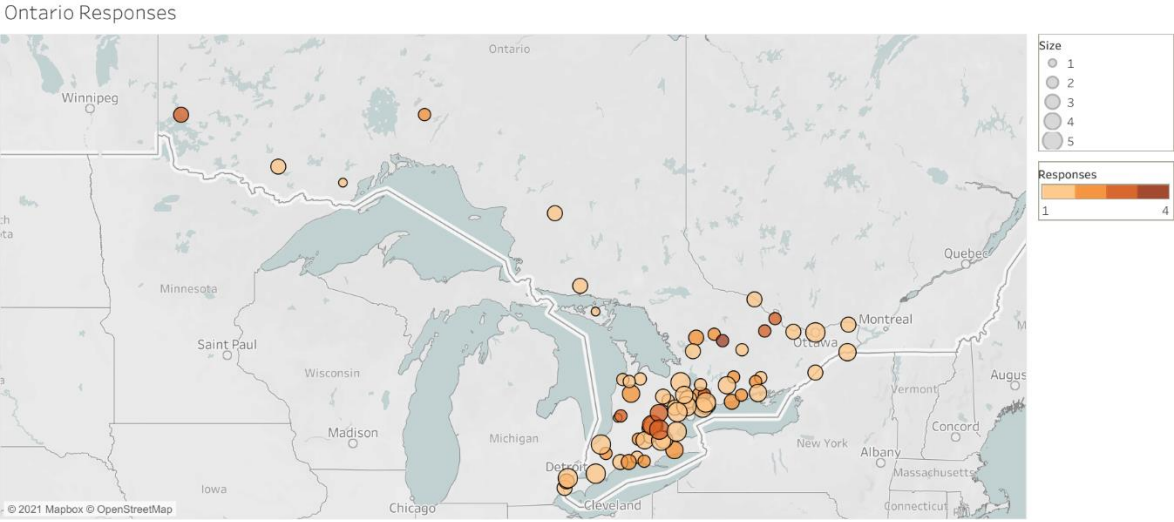


Figure 4.1: Map representing the survey responses from Ontario. The circle's size represents the municipality's size (1- Rural, 2-Small municipality without density, 3-Small municipality with density, 4-Medium municipality, 5-Large municipality). The colour represents the number of responses from that municipality.

BC Responses

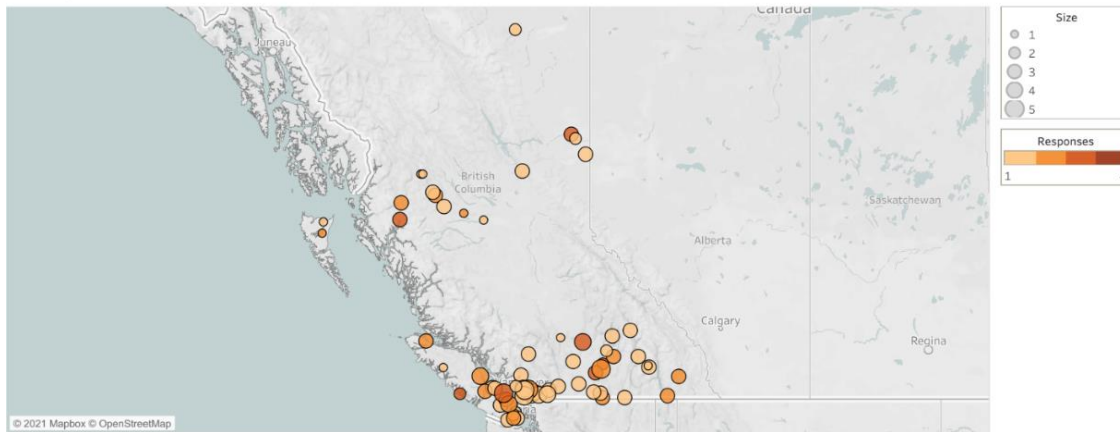


Figure 4.2: Map representing the survey responses from BC. The circle's size represents the municipality's size (1- Rural, 2-Small municipality without density, 3-Small municipality with density, 4-Medium municipality, 5-Large municipality). The colour represents the number of responses from that municipality.

Using the municipality names, the municipalities' political leaning was found. The municipalities in BC appear to be more left-leaning than the municipalities in Ontario, as seen in **Error! Reference source not found.** and **Error! Reference source not found.**

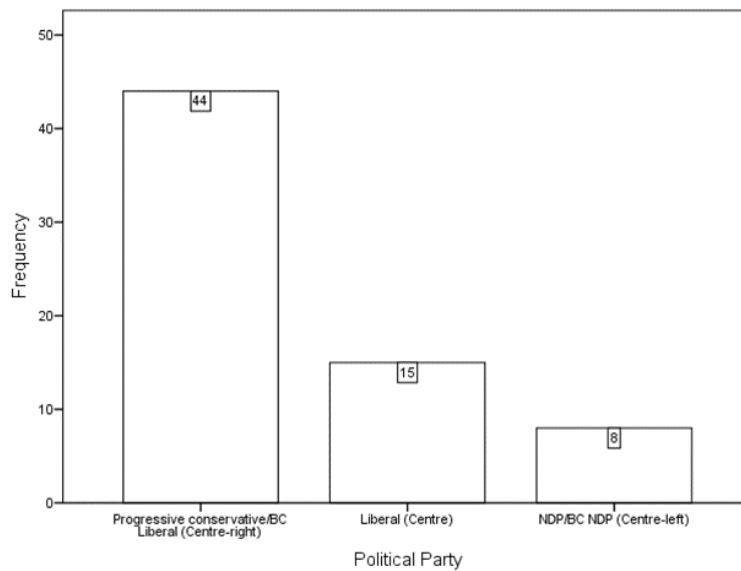


Figure 4.3: Dominant Political Leaning of Ontario Municipalities ~2003-Present

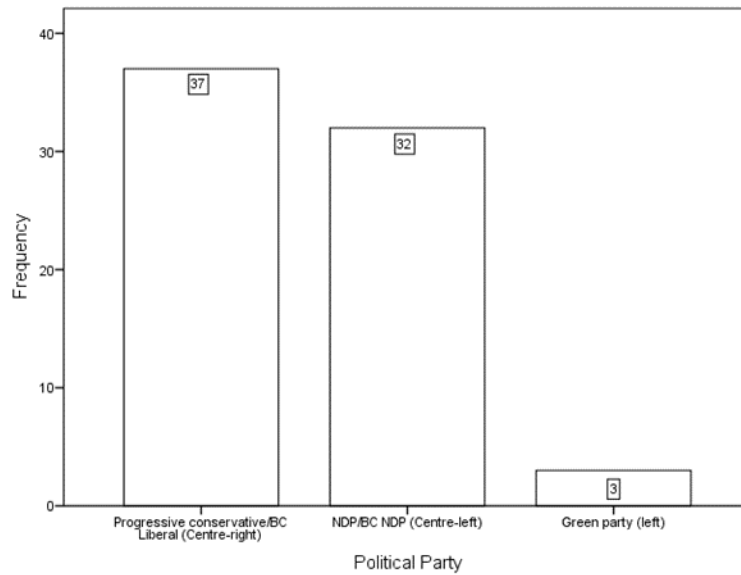


Figure 4.4: Dominant Political Leaning of BC Municipalities ~2003-Present

4.3 Sustainability Initiatives Adopted (Objective 2)

Municipalities were given a list of 11 initiatives to choose from and asked which of the initiatives they had in place in their municipality. Overall, most initiatives adopted tend to be within the realm of expected municipal responsibilities, such as transportation initiatives or could be categorized as ‘low-hanging fruit’ for sustainability initiatives that are easily adopted. For example, the most adopted initiatives were energy-efficiency measures, with 60 Ontario and 52 BC municipalities having adopted these (Total 112). Energy-efficiency measures also seem to be the most popular initiative in Ontario. The most popular initiative in BC seems to be transportation planning initiatives. Most of the initiatives that were adopted also belonged to the environmental dimension of sustainability. This conclusion might be a little premature because municipalities chose from a list of initiatives. This list contained more environmental initiatives than economic or equity initiatives (This list was adopted from the research by Saha and Paterson (2008)). However, in the open-ended space at the end of the initiatives, municipalities were asked to mention any other initiative that might not have been on the given list. Most respondents to that question mentioned environmental initiatives. It is possible that the respondents mentioned more environmental initiatives than other kinds due to the nature of the study. Only one response per municipality was considered, as mentioned in Chapter 3 for the initiatives adopted. However, for table 4.6, the responses all responses from the same municipality were considered, but each was checked, and repeated values were removed. The number of initiatives adopted by the size of the municipality is provided in Appendix D, which shows that even small

municipalities claim to have adopted many initiatives despite problems faced by them (discussed in sections below).

Table 4.3: Environmental initiatives adopted by municipalities in Ontario and BC

Initiatives	BC	Ontario	Count (Number of municipalities)
Energy efficiency initiatives e.g., i) Energy conservation initiatives ii) Alternative energy initiatives iii) Green building initiatives	52	60	112
Transportation planning initiatives e.g., i) Limits to downtown parking ii) Operation & promotion of public transit iii) Bicycle & pedestrian-oriented development	55	43	98
Pollution prevention initiatives e.g., i) Household waste recycling ii) Industrial recycling efforts iii) Air/ water pollution reduction efforts	38	43	81
Open space and Natural resource protection initiatives e.g., i) Zoning used to delineate environmentally sensitive areas ii) Wildlife habitat zoning	43	46	89
Tracking progress on various initiatives e.g., i) Indicators to track initiatives in the last 5 years ii) Sustainability progress reports in the last 5 years	32	26	58
Educational progress initiatives e.g., i) Initiatives to improve quality of education ii) Environmental education programs for communities	27	18	45

Table 4.4: Economic initiatives adopted by municipalities in Ontario and BC

Initiatives	BC	Ontario	Count (Number of municipalities)
Sustainable economic growth initiatives e.g., i) Brownfield redevelopment ii) Tax incentives for environmentally friendly developments iii) Supporting local businesses	41	42	83
Food and agricultural initiatives e.g., i) Agricultural protection zoning ii) Support for local fishing and farming through infrastructure, bylaws, etc.	30	33	63

Table 4.5: Equity initiatives adopted by municipalities in Ontario and BC

Initiatives	BC	Ontario	Count (Number of municipalities)
Social justice and equity initiatives e.g., i) Affordable housing ii) Homeless prevention and intervention program iii) Women/ minority business community development corporations	38	35	73
Public Health Initiatives e.g., i) Disease response programs ii) Mental health awareness iii) Obesity, senior health improvement initiatives, etc.	25	28	53
Governance measures e.g., i) Encouraging public participation (public hearings, neighborhood groups, etc.) ii) Involvement of the business community	52	42	94





-  Normal municipal initiatives
-  Low hanging fruit initiatives
-  Governance initiatives
-  Normal municipal/ low-hanging fruit initiatives

Table 4.6: Content analysis of the responses mentioning other initiatives

Type	Category	Example	Number of mentions
Environmental initiatives	Other climate action initiatives	“Climate Change Plan” “Climate Change Action Plan underway”	24
	Local wildlife-related initiatives	“Bear Smart accreditation” “Bat Education and Ecological Protection Society” “Salmon habitat (riparian) restoration”	7
Equity initiatives	Social initiatives	“Equity Learning” “Access and Age friendly [sic] planning”	7
Economic initiatives	Economic initiatives	“Strong development permit guidelines” “Infrastructure [sic] initiatives [sic]”	3

Note: For table 4.6, if two respondents from the same municipality mentioned an initiative twice, it was only considered once. If they mentioned two different initiatives, both were considered.

4.4 Individual Characteristics of Respondents

4.4.1 Awareness of sustainability and the SDGs (Objective 3)

Most of the respondents (77.2%) ‘somewhat agreed’ or ‘strongly agreed’ that they had a fair amount of knowledge about all sustainability pillars (Median= 4; IQR= 1; Mean=3.93, SD=0.94; Table 4.7). Similarly, 89.3% of respondents said they ‘somewhat agree’ and ‘strongly agree’ that they were aware of existing sustainability problems in the world and were interested in preventing or mitigating them (Median= 4; IQR=1; Mean=4.33, SD=0.74). When comparing the medians of the responses from the two provinces for the second question, it appeared that respondents from BC (Median= 5) agreed to a greater extent that they were interested in preventing and mitigating sustainability issues than the respondents from Ontario (Median= 4) (Table 4.7).

In contrast, only six participants (2.9%) indicated that they were ‘extremely familiar’ with the SDGs. Another 74 respondents (35.9%) indicated that they were familiar to a certain extent. Moreover, 59 respondents (28.6%) indicated that they were not at all familiar with the SDGs (Tables in Appendix D). When looking at the difference between Ontario and BC respondents regarding familiarity with the SDGs, the median was the same, but the distributions appeared to be quite different (Figure 4.5).

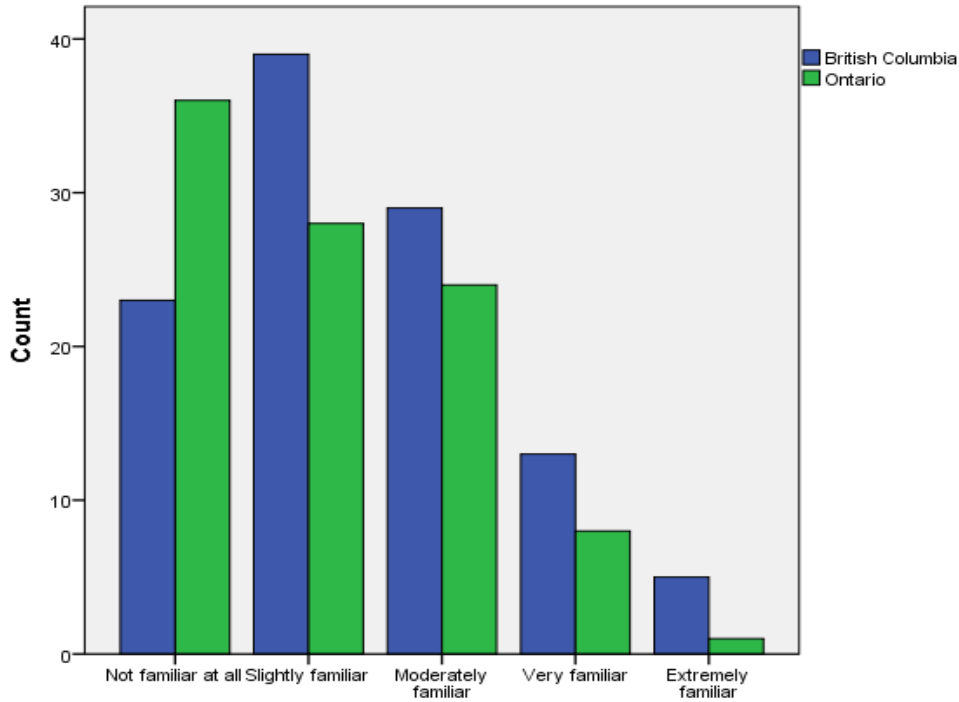


Figure 4.5: Familiarity with SDGs by province

From the clustered bar graph, it appears most of the respondents from Ontario were not at all familiar with the SDGs. Since the distributions are very different, a Mann-Whitney U test was conducted to see if the responses from the two provinces were significantly different from each other. Based on a Mann-Whitney U Test, there was a significant difference in the familiarity of the SDGs between respondents from Ontario (Median= 2, n=97) and BC (Median =2, n= 109) ($U=4326.50$, $z= -2.34$, $p= 0.019$ $r=0.16$). However, the effect size (r) indicates that BC respondents are only mildly more familiar with the SDGs than respondents from Ontario (Mean Rank BC = 121.31, Mean Rank Ontario=93.60).

Table 4.7 Sustainability awareness of respondents

Sustainability awareness questions	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Mean (SD)	Median (IQR)
	Count & Frequency						
I believe I possess a fair amount of knowledge about the environment, equity, and economic dimensions of sustainability and how they influence each other (n=206)	4 (1.9%)	16 (7.8%)	27 (13.1%)	103 (50.0%)	56 (27.2%)	3.9 (0.94)	4 (1)
British Columbia (n=109)	1 (0.9%)	6 (5.5%)	12 (11%)	59 (54.1%)	31 (28.4%)	4.04 (0.84)	4 (1)
Ontario (n=97)	3 (3.1%)	10 (10.3%)	15 (15.5%)	44 (45.4%)	25 (25.8%)	3.80 (1.037)	4 (2)
I am aware of sustainability problems that exist, and I am interested in preventing/mitigating them (n=204)	1 (0.5%)	4 (1.9%)	15 (7.3%)	90 (43.7%)	94 (45.6%)	4.3 (0.74)	4 (1)
British Columbia (n=109)	0 (0%)	0 (0%)	6 (5.5%)	47 (43.1%)	56 (51.4%)	4.46 (0.60)	5 (1)
Ontario (n=95)	1 (1%)	4 (4.1%)	9 (9.3%)	43 (44.3)	38 (39.2)	4.19 (0.85)	4 (1)

4.4.2 Environmental attitude (Objective 3)

Two questions were asked to determine the respondents' environmental attitudes. These questions were asked because the top manager's attitude towards change was a factor considered in the early *diffusion of innovation in organizations* research. A large number of respondents (70.4%) 'strongly agreed' that the Earth must be protected from further human damage, and 20.4% 'somewhat agreed' with this statement (Median= 5; IQR= 1; Mean=4.6. SD=0.73; Table 4.8). In addition, most respondents 'strongly' or 'somewhat' agreed 125 (60.7%), 54 (26.2%), respectively, that the environment is **not** a low priority for them. There appeared to be no significant differences between the responses from the two provinces based on the descriptive statistics.

Table 4.8: Summary statistics for the environmental attitude of respondents

Environmental attitude questions	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Mean (SD)	Median (SD)
	Count & Frequency						
I believe the Earth has very limited room and resources and so we must protect it from further human damage (n=204)	1 (0.5%)	4 (1.9%)	12 (5.8%)	42 (20.4%)	145 (70.4%)	4.60 (0.73)	5 (1)
British Columbia (n=107)	1 (0.9%)	3 (2.8%)	6 (5.5%)	19 (17.4%)	78 (71.6%)	4.59 (0.80)	5 (1)
Ontario (n=97)	0 (0%)	1 (1%)	6 (6.2%)	23 (23.7%)	67 (69.1%)	4.61 (0.65)	5 (1)
The environment is a low priority for me compared with a lot of other concerns (n=205) (For this variable the Likert scale goes from 5-1)	125 (60.7%)	54 (26.2%)	17 (8.3%)	5 (2.4%)	4 (1.9%)	4.41 (0.89)	5 (1)
British Columbia (n=108)	67 (61.5%)	29 (26.6%)	9 (8.3%)	1 (0.9%)	2 (1.8%)	4.56 (0.84)	5 (1)
Ontario (n=97)	58 (59.8%)	25 (25.8%)	8 (8.2%)	4 (4.1%)	2 (2.1%)	4.37 (0.95)	5 (1)

These responses on sustainability awareness and environmental attitude represent a personal responsibility to sustainability. However, a personal commitment to sustainability does not always ensure that the municipal government makes corresponding decisions. Decisions in a municipal government are made by a collective decision-making process.

These responses might suggest that municipal staff are inclined to act as soon as they could. In contrast to these responses, municipal authorities were asked if their municipalities preferred to ‘wait and see’ when deciding to adopt initiatives. Many of the respondents (31.6%) indicated that they ‘somewhat disagree’ with the statement (Median= 3; Mean = 2.90). However, 73 (35.4%) respondents either chose ‘agree’ or ‘strongly agree’ and were given an opportunity to elaborate on why their municipalities preferred to do that (Table in Appendix D). ‘Knowledge’ and ‘interest’ as barriers were reported by 34 and 8 respondents, respectively. The respondents who stated ‘knowledge’ as a barrier stated that they did not wish to be the ‘test case’ for new initiatives, suggesting a lack of awareness of such initiatives’ outcomes. This further reinforces the idea that a personal commitment on the respondent's part might not be enough to ensure the adoption of initiatives as there may be others who lack knowledge or interest.

4.5 Internal Characteristics of Municipalities

4.5.1 Presence of Key Individuals and Priorities of Council and City Staff (Objective 1)

Key individuals were identified by literature to be important players in innovation adoption. In the open-ended space at the end of the survey, one respondent (ON 4) indicated that it could sometimes be a barrier to adopting initiatives if a key individual is not present. To evaluate the presence of key individuals, respondents were asked to comment on whether there are people within the municipal government that are keen to implement sustainability initiatives and are often ready to take charge of the discussion. Many of the respondents (113, 54.8%) ‘somewhat’ or ‘strongly’ agreed (Median= 4; Mean= 3.42) with this statement. Eleven participants (5.3%) said that they ‘strongly disagree’ (Tables in appendix D). To evaluate the difference between Ontario and BC for the reported presence of key individuals in the municipalities on a closer level, clustered bar graphs were generated.

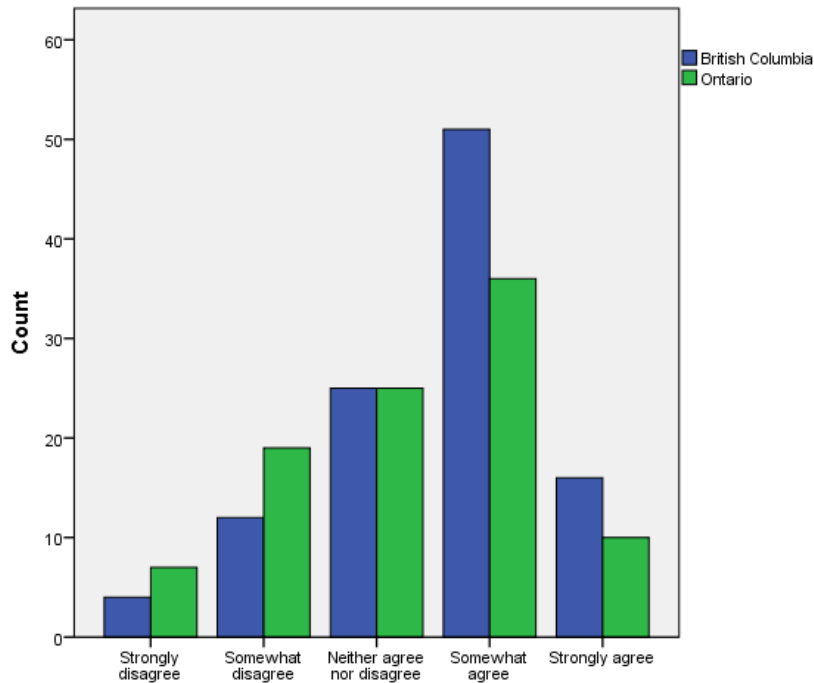


Figure 4.6: Presence of key individuals by province

Since this was a perception question, multiple responses from the same municipality were considered. This is because different respondents may have different ideas on the presence of key individuals, even if they are from the same municipality. From the graph, it appeared that distributions were different. The median of BC was higher (Median=4) than the median of Ontario (Median=3). Respondents from BC seemed to

agree to a greater extent that there were key individuals in their municipalities keen on implementing initiatives.

In the open-ended space at the end of the survey, respondents expressed different opinions about who is responsible for prioritizing sustainability initiatives and actions. The city staff mention that it is the council's priority that matters most, whereas some council members suggest that decisions are based on the staff's professional advice. Twelve respondents suggested that even though they desire changes, it is sometimes up to the council to make the final decision, and the staff's role is only to advise the council and not make decisions. For example, respondent BC 13 noted a distinct difference between a staff person and an elected official in a municipality, with the staff often dedicating their entire career to their field. Elected officials being in office for possibly only one four-year term, and therefore having to appeal to a broad voter base whom they represent in order to be re-elected. Respondent BC 13 also mentioned that they have been on the council for 20 years and have seen the council's priorities change based on who has been elected to the council at that time.

Respondents were asked if their municipality prefers to 'wait and see' when there were new proposals for sustainability initiatives. As previously mentioned, respondents who chose 'agree' or 'strongly agree' were asked why their municipalities preferred to 'wait and see.' Three respondents mentioned political reasons stating that politically it was the safest approach for them.

Four of the respondents mentioned that their council's priority sometimes does not lie with the adoption of sustainability initiatives. The most mentioned reason for this appeared to be fear of public reaction, be it in the case of failure of the initiative or the fear of not being re-elected. One respondent (BC 35) mentioned that sustainability initiatives are considered to affect economic drivers adversely. However, all these responses appear to be from the perspectives of the city staff.

Four of the elected officials who responded (Councilors and Mayors) indicated that they desire to do more but are often faced with other challenges like lack of support from other levels of government or funding. However, in two instances, respondents suggested that the city staff does not desire to implement initiatives in their municipalities. For example, in their experience, respondent (BC 8) noted that when the staff or CAO do not believe in climate or environmental protection, they become the gatekeepers through whom all information is filtered.

4.5.2 Internal Municipal Environment (Municipal culture, sustainability tradition, and citizen interests) (Objective 1)

The importance of a sustainability culture on adopting sustainability initiatives was relevant (Median=4; Mean = 3.87) to the respondents, with 50.5% and 22.3% of the respondents finding it 'somewhat relevant'

or ‘extremely relevant,’ respectively (**Table 4.9**). Respondent ON 8 notes that if sustainability becomes a part of their culture, it will allow them to be more successful at implementing or adopting sustainability initiatives. Other aspects of municipality culture, such as a history of implementing initiatives and concerns expressed by citizens, were also asked.

Table 4.9: Importance of sustainability culture, history, and citizens on adoption of sustainability initiatives

Municipality characteristics	Extremely irrelevant	Somewhat irrelevant	Neither relevant nor irrelevant	Somewhat relevant	Extremely relevant	Mean (SD)	SD & Mean
	Frequency & Count					Value	Value
Existing sustainability culture (n=196)	8 (3.9%)	10 (4.9%)	28 (13.6%)	104 (50.5%)	46 (22.3%)	3.87 (0.97)	4 (0)
British Columbia (n=107)	5 (4.6%)	6 (5.5%)	16 (14.7%)	48 (44.0%)	32 (29.4%)	3.90 (1.05)	4 (2)
Ontario (n=89)	3 (3.1%)	4 (4.1%)	12 (12.4%)	56 (57.7%)	14 (14.4%)	3.83 (0.87)	4 (0)
A long history of implementing sustainability initiatives which has served as a knowledge base (n=197)	15 (7.3%)	29 (14.1%)	44 (21.4%)	86 (41.7%)	23 (11.2%)	3.37 (1.11)	4 (1)
British Columbia (n=107)	9 (8.3%)	14 (12.8%)	22 (20.2%)	49 (45.0%)	13 (11.9%)	3.40 (1.12)	4 (1)
Ontario (n=90)	6 (6.2%)	15 (15.5%)	22 (22.7%)	37 (38.1%)	10 (10.3%)	3.33 (1.09)	4 (1)
Rallies/concerns expressed by citizens regarding the adoption of sustainability initiatives (n=198)	10 (4.9%)	20 (9.7%)	32 (15.5%)	97 (47.1%)	39 (18.9%)	3.68 (1.06)	4 (1)
British Columbia (n=107)	4 (3.7%)	10 (9.2%)	21 (19.3%)	52 (47.7%)	20 (18.3%)	3.69 (1.00)	4 (1)
Ontario (n=91)	6 (6.2%)	10 (10.3%)	11 (11.3%)	45 (46.4%)	19 (19.6%)	3.67 (1.13)	4 (1)

In the question of why municipalities delay adopting initiatives, eight respondents mentioned council and community culture as one reason. Another aspect of the municipal culture was the value placed on citizen participation which is discussed in the following section. Since the medians and the means do not suggest a major difference between the province, a Mann-Whitney U test was run to examine if there was a significant difference between these provinces. The test revealed no significant difference in responses between the two provinces for all three factors.

4.5.3 Public Pressure and Social Acceptability (Objective 1)

It also appears that increasing citizen participation in sustainability activities is a relevant consideration for the municipal staff from both provinces when considering adopting initiatives, with 51.0% and 30.6% of respondents indicating it is ‘somewhat relevant’ or ‘extremely relevant’ (Median= 4; Mean = 4.05). The table for this response is available in Appendix D. In the open-ended responses, nine respondents mentioned that public acceptance is a crucial consideration for them while considering the adoption of initiatives. For example, respondent ON 31 noted that their municipality had a very vocal community that was very critical of their town, and so the staff was apprehensive towards trying anything new. In three other cases also, the community influenced the adoption of initiatives negatively. For example, respondent BC 10 notes that there was a tendency to place more weight on the economic impacts of an initiative over the environmental benefits or future risk mitigation in their municipality and community.

Respondents suggested that a considerable amount of power lies with the public regarding whether or not sustainability initiatives get adopted. In three cases, local advocates positively influenced elected officials to adopt initiatives. For example, respondent BC 7 notes that local advocates often challenged political leaders to adopt good initiatives in their municipality. In another municipality, respondent BC 22 noted that cultural factors and a lack of awareness among the citizens were a significant barrier to sustainability adoption in their municipality, with the council following the citizens in a bid to be re-elected. An additional four respondents mentioned that the public influences decision-makers, making mayors and councilors very cautious about trying new initiatives so that they can be re-elected.

4.5.4 Resources: Municipal Staff and Sustainability Staff (Objective 1)

Respondents provided additional insights on barriers to adopting sustainability initiatives in the open-ended question at the end of the survey. Sixteen respondents mentioned staff shortages as a reason for delaying the adoption of initiatives. These staff shortages were particularly acute in small municipalities, with 12 respondents mentioning this issue. Due to such shortages, small municipalities mentioned that they were unable to prioritize the adoption of initiatives. They also reported that they sometimes relied too much on a few individuals to carry out most sustainability tasks, even if they lacked expertise. Respondent BC 25 noted that they often relied on their CAO for tasks that did not have dedicated staff like sustainability issues as they were a small municipality. The CAO often did this off the side of his/ her desk.

Respondents were asked if their municipalities had offices or persons dedicated to sustainability. Only one response per municipality selected by the Kish-Grid method was used. A majority of respondents (55%) stated that they have neither an office nor a person for sustainability. Another 17.9% of the respondents

specified ‘other’ and elaborated on their response. Some municipal governments had climate change or environmental offices or staff, with various roles (Table 4.10).

Table 4.10: Who performs the role of sustainability office or person in the municipality?

Category	Description	Examples
Hybrid role (within municipality)	The role of sustainability committee/planner is done by someone or a group of people, and they also hold other positions	“Hybrid role - Senior Planner/Manager of Community Sustainability” “Mayor’s task force and part of some staff time”
Climate change or environmental office or person	There is mention of a climate change or environmental officer or office in place of a sustainability office or position	“Environmental Committee - not quite the same as a sustainability committee” “Climate Change Coordinator”
Role sometimes performed by citizens	The respondent mentions an advisory committee or citizen performing the duty	“Environment Advisory committee” “...citizen-city committees for environment”
Service provided through regional municipality/ upper-tier	The respondent mentions that the service is provided by the regional municipality or an upper-tier municipality	“That service provided by the upper tier [sic]” “The County has a Climate Change Program Coordinator”
Contracted position	The municipality hires a person through a contract either by themselves or with the help of another agency or network	“Contracted planning department” “one year [sic] contract person, funded by FCM, otherwise it’s [sic] unlikely we would have them”
Obsolete position	The position no longer exists	“We did but cut the budget and the position”

Note: Only the response selected by the Kish-Grid approach was selected for this table

1.1 Resources: Financial and other (Objective 1)

When municipalities were asked why they chose to ‘wait and see’ before adopting sustainability initiatives, most respondents (53) mentioned funding and financial reasons. However, many others (34) also mentioned knowledge-related barriers suggesting that municipalities sometimes did not have the expertise to adopt initiatives. These barriers also appear to be more strongly felt in small municipalities, with 12 respondents providing comments regarding funding issues in small municipalities.

Further problems related to financial constraints were also reported. Eight respondents indicated that their funding goes towards fulfilling other more pressing priorities like maintaining roads or sidewalks. If they need additional funding, they must apply for project grants or other forms of funding. One respondent (BC 6) noted that such application processes are long and often unpredictable. Two other respondents from small municipalities mentioned that they compete with larger municipalities for the same pot of funding from the provincial and federal governments and lack the motivation to apply for such grants.

4.6 External characteristics

4.6.1 Influence of Higher levels of government (Objective 1)

The respondents were asked three questions about the kinds of support their municipalities received from higher levels of government. The three questions asked respondents the importance of finances, training and human resources, and incentives from the provincial and federal governments. The results are displayed in 4.11. Training and human resources appear to be the least important (Median =3, Mean= 3.16) when compared with financial resources (which appear to be the most important with Median = 5, Mean= 4.39) followed by incentives (Median =4, Mean= 4.29). According to the descriptive statistics and the Mann-Whitney U test, there appeared no significant difference between the two provinces on the importance of these higher-level government resources. Thematic analysis of the open-ended questions showed that higher levels of government both positively and negatively impacted the adoption of initiatives in municipalities.

Table 4.11: The importance of a) financial resources b) Training and human resources c) Incentives from provincial or federal governments.

Resource from the higher level of government	Not at all important	Slightly important	Moderately important	Very important	Extremely important	Mean (SD)	Median (IQR)
	Count and Frequency						
Financial resources from the provincial/federal government for sustainability initiatives (n=201)	1 (0.5%)	5 (2.4%)	19 (9.2%)	66 (32%)	110 (53.4%)	4.39 (0.80)	5 (1)
British Columbia (n=106)	0 (0%)	3 (2.8%)	10 (9.2%)	37 (33.9%)	56 (51.4%)	4.38 (0.77)	5 (1)
Ontario (n=95)	1 (1.0%)	2 (2.1%)	9 (9.3%)	29 (29.9%)	54 (55.7%)	4.40 (0.83)	5 (1)
Training and human resources from the provincial/ federal governments (n=195)	14 (6.8%)	47 (22.8%)	52 (25.2%)	58 (28.2%)	24 (11.7%)	3.16 (1.14)	3 (2)
British Columbia (n=99)	8 (7.3%)	21 (19.3%)	26 (23.9%)	30 (27.5%)	14 (12.8%)	3.21 (1.17)	3 (2)
Ontario (n=96)	6 (6.2%)	26 (26.8%)	26 (26.8%)	28 (28.9%)	10 (10.3%)	3.10 (1.11)	3 (2)
Incentives (e.g.: tax breaks and project funding) provided by provincial/ federal governments (n=201)	0 (0.0%)	9 (4.4%)	21 (10.2%)	74 (35.9%)	97(47.1%)	4.29 (0.83)	4 (1)

British Columbia (n=105)	0 (0%)	4 (3.7%)	12 (11.0%)	42 (38.5%)	47 (43.1%)	4.26 (0.81)	4 (1)
Ontario (n=96)	0 (0.0%)	5 (5.2%)	9 (9.3%)	32 (33.0%)	50 (51.5%)	4.32 (0.85)	5 (1)

Respondents from both provinces mentioned that their municipalities looked to the provincial and federal governments for direction on which initiatives to implement and how to implement them. Nine respondents were very clear on what they required from higher levels of government. This direction appeared to take the form of legislation, policy documents, and concrete examples on implementing sustainability initiatives into their municipality. For example, respondent ON 27 called on the federal and provincial government to appoint a small panel of independent experts to assess potential approaches for their sustainability issues and have a menu of preferred choices from which municipalities can choose based on their particular circumstances (e.g., population, natural topography, distance to facilities, use of newer technologies such as incineration, appropriateness of new landfill sites, etc.). The respondent insisted that they are only likely to find a suitable solution by accident without this kind of expertise. This response also shows that the approach to getting the “right” solution is an unpredictable process without support and resources. Even if there already exists support in this form, the response indicates that municipalities are not aware of it. Another one out of the nine respondents also mentioned that they would save a considerable amount financially if provincial or federal governments provided easy-to-follow templates for all municipalities to follow. Respondent ON 9 insisted that municipalities waste precious resources by each creating a climate action plan and calls on the province to provide province-wide templates that municipalities could follow and then adapt.

As for training resources, one respondent ON 17 mentioned that they had never heard of such resources being offered by the provincial and federal government but indicated that they would benefit from it. In contrast, the participant in the interview indicated that they did not need such resources. They felt that it was their job to educate themselves and not be dependent upon other levels of government to provide training (IN1).

I don’t [sic] think that’s [sic] their role. I think we need to educate ourselves. The region that I live in, we got together and did a climate risk assessment. We might be one of the very few regions in Canada that’s [sic] taken the bulls by the horns and looked at what risks face us. And I feel the rest of them are just yelling into the wind without any actual empirical data. So, I don’t [sic] need the federal government telling me what I already know.

Three respondents commended provincial governments’ efforts, which appeared to be mainly financial support. At the same time, four others mentioned that higher levels of governments created barriers to

implementation and were not doing ‘enough.’ The first participant in the interview, IN1, also indicated that they wished that higher levels of government would treat them as “partners” instead of “adversaries.” while talking about the support offered by higher levels of government, saying:

I believe that the federal government and the provincial government need to see municipalities as partners and not adversaries. If they partnered with them on opportunities, then we could go forward and leave a lighter footprint. We could also work a lot closer with our First Nations communities.

In the question on why municipalities delay the adoption of sustainability initiatives, six respondents mentioned a lack of action from higher levels governments as a reason.

4.6.2 Influence of Networks (Objective 1)

Out of the 140 unique municipalities surveyed, 113 municipalities (80.7%) participated in FCM, and 28 municipalities (20%) indicated that they participated in ICLEI. However, there was evidence of other networks. There were 53 respondents who mentioned involvement in regional networks. Regional networks consist of municipalities that belong to a particular region, for example, ‘X County Sustainability Group.’ In addition, 34 municipalities mentioned national networks, which the federal government typically introduces. Twenty-seven municipalities mentioned participation in Provincial networks like ‘AMO’ (Association and Municipalities in Ontario) or ‘UBCM’ (Union of BC municipalities), and 7 mentioned international networks like the ‘Green Sports Alliance.’ The types of networks and examples are shown in **Error! Reference source not found.** Some respondents (23) expressly indicated that some individuals from their municipalities participated in the network, suggesting that all municipal authorities are not equally aware of the networks. This was also evident when two or more respondents from the same municipality, in some cases, named different networks.

Among the other networks mentioned, 80 networks were various climate change-related networks, like ‘clean air partnership’ (with 21 of them being ‘Climate Caucus’ and 4 of them mentioning ‘Global Covenant of Mayors’). In addition, Sixteen were energy-related networks such as ‘Energy Managers Council’ or ‘Energy Step Code Council.’ Five were sustainability-related networks such as ‘Canadian Urban Sustainability Practitioners (CUSP).’ The rest were networks that handled various tasks to help municipalities meet different goals like AMO or UCBM.

Table 4.12: Types of networks to which responding municipalities belong

Category	Examples	Frequency of mentions
Local Networks	County X Sustainability Group Y Region-wide collaborative initiative focused on climate change mitigation. Z Climate Change Partnership	53
Canada-wide network	Climate Caucus Clean Air Council	34
Provincial network	Association of Municipalities of Ontario CleanBC	27
International/Global networks	Global Covenant of Mayors Earth hour committee.	7

Note: For these other responses, all responses were considered. However, if two respondents from a municipality mentioned the same network, it was considered only once. If two respondents from the same municipality mentioned different networks, both were considered.

The top reason why municipalities (or individuals in municipalities) joined these networks is to gain knowledge and ideas and access resources (45 respondents: Table 4.13). The second most mentioned reason was funding.

Table 4.13: Reasons for municipalities joining networks

Theme	Description	Number of respondents referencing
Knowledge and ideas	The response mentions that they joined to help facilitate the spread of new ideas, gain knowledge and information, or learn from each other.	45
Funding Opportunities or financial reasons	The municipalities mentioned that they joined the network for funding or grants. Unless explicitly mentioned otherwise, resources were considered as financial resources.	35
Advocacy, support, and networking reasons	The response indicates that they joined for advocacy, to show/receive support, and to network with other members	24
Champion for the network	The response indicates that were people in the municipality who are keen on joining the network, such as a councillor, a mayor, or one of the staff	15

Theme	Description	Number of respondents referencing
Need for their community to maintain a competitive advantage or demonstrate leadership	The response indicates that they joined the network because they wanted their community to be leaders or their municipality to remain competitive	12
Care/Concern for environment/ sense of duty to sustainability issues	The response explicitly indicates care/ concern for sustainability issues	8
Invited to join	The response states that the municipality was invited to join the network	2

4.7 Perceived advantages of adopting initiatives (Objective 1)

Respondents were asked whether adopting sustainability initiatives were important to enhance the municipality’s reputation and credibility. A majority of respondents (117 or 56.8%) indicated that this is ‘very’ or ‘extremely’ important. However, gaining recognition and awards does not seem as important to municipalities (Median=2, Mean= 2.42), suggesting this is only ‘slightly’ to ‘moderately’ important. One respondent (BC 21) mentioned that awards do not depict a realistic picture of what goes on in a municipality and therefore facilitate ‘greenwashing.’ That respondent insisted on stricter regulations and a more centralized system to determine the recipients of these awards.

In order to examine if there was a difference between provinces, descriptive statistics were examined. In this sample, it appeared that respondents in Ontario (Median= 4) seemed to place more importance on enhancing the reputation and credibility of their municipalities than BC (Median= 3). Ontario even showed less variability (IQR=0). For the second advantage (Gaining recognition and awards), the median value for Ontario (Median= 3) is again higher than BC (Median= 2), with Ontario showing less variability (IQR=1). This suggests that Ontario respondents from this sample might be placing more importance on gaining recognition and rewards for their municipalities.

Table 4.14: Perceived advantages of adopting sustainability initiatives

Advantage to municipality	Not at all important	Slightly important	Moderately important	Very important	Extremely important	Mean (SD)	Median (IQR)
	Frequency and Count						
Enhancing the reputation and credibility of the municipality (n=204)	3 (1.5%)	23 (11.2%)	61 (29.6%)	78 (37.9%)	39 (18.9%)	3.62 (0.97)	4 (1)
British Columbia (n=107)	3 (2.8%)	17 (15.6%)	44 (40.4%)	26 (23.9%)	17 (15.6%)	3.35 (1.02)	3 (1)
Ontario (n=97)	0 (0%)	6 (6.2%)	17 (17.5%)	52 (53.6%)	22 (22.7%)	3.93 (0.81)	4 (0)
Gaining recognition and awards for sustainable municipalities (n=199)	39 (18.9%)	69 (33.5%)	62 (30.1%)	27 (13.1%)	2 (1.0%)	2.42 (0.99)	2 (1)
British Columbia (n=103)	26 (23.9%)	39 (35.8%)	27 (24.8%)	10 (9.2%)	1 (0.9%)	2.23 (0.97)	2 (2)
Ontario (n=96)	13 (13.4%)	30 (30.9%)	35 (36.1%)	17 (17.5%)	1 (1.0%)	2.61 (0.97)	3 (1)

In addition to these questions, respondents were asked whether personal learning was a factor in adopting initiatives. Many respondents (179, 86.9%) indicated that they search for an opportunity to gain knowledge through the adoption of initiatives (Table in Appendix D).

4.8 Other Insights

4.8.1 Challenges to Sustainability Faced by Smaller Municipalities

Smaller municipalities were expected to face difficulties in adopting initiatives than larger municipalities, as suggested by previous literature. However, an interesting finding of the research was the complexity of problems faced by smaller municipalities. Excluding the initiatives that small municipalities had no control over, they reported facing problems such as resource constraints for initiatives over which they did have control. These resource constraints took the form of funding and staff shortages, as previously mentioned.

It was also suggested that regional and provincial governments should aid municipalities in adopting initiatives through some programs. However, even encouragement like that seems to be biased against small and rural municipalities. Three respondents noted that even if there were regional or provincial programs to encourage initiatives, such as recycling centres, they were located closer to larger municipalities. Smaller municipalities often had to travel long distances for the same services and hire external contractors to help with transportation.

Finally, two of the respondents from smaller municipalities also explained how population trends affected their adoption of initiatives. One respondent mentioned that they are facing a shrinking population problem. Another mentioned that they have a floating population as a tourist town, fluctuating between being a smaller municipality and a larger municipality. They then went on to explain that the property tax model is not conducive to them. Once again, the problem seemed to circle back to financial constraints.

4.8.2 Uniqueness of municipalities

Finally, a common theme in the open-ended responses was that each municipality is different and has issues that are quite specific to its conditions, like its geography, population, programs, and opportunities close to it. This difference sometimes also seemed to be due to the municipality's size and distance from large population centres. This highlights how sensitive municipalities are to various factors that could have different levels of influence on adopting initiatives. For example, one respondent (ON 27) noted that all their landfills are near capacity, so they hire a private contractor to haul their garbage more than 500 km to a privately owned landfill. He also insisted that small municipalities in that region face similar problems as theirs with landfills nearing capacity.

There also seemed to be some differences caused by the diversity of population present in a municipality. For example, respondent BC 21 noted that there was a divide between indigenous and non-indigenous people in their municipality. Respondent BC 39 indicated that they are a tourist town, and their issues are unique compared to other municipalities.

Various municipalities also seem to have different priorities based on other risks and global issues. For example, one respondent (BC 5) mentioned that since their municipality experiences frequent flooding, flood mitigation is an important priority. Three municipalities even stated that the recent COVID-19 pandemic has impacted their ability and will to adopt sustainability initiatives as more urgent issues require the resources.

The second interview participant also gave insights into how the municipality characteristics and different kinds of initiatives could cause each municipality to have different motivational factors and different barriers:

Each municipality depending on the size has different challenges. For example, a city like Toronto, they [sic] literally have a 100 different people working on sustainability, so their concerns and considerations would be considerably different than say a place like Clarington with 90,000 people and only one sustainability and climate change coordinator [...] the motivations and challenges in the community side of climate initiatives will be significantly different than on the corporate side of climate initiatives [...] each specific project has its own challenges, motivating factors and benefits. (IN 2).

5 Discussions

The primary objectives of this research were to identify the barriers and motivators to the adoption of sustainability initiatives, gain insight on the initiatives already adopted, and determine knowledge of the SDGs and sustainability by elected city officials and staff.

5.1 Barriers and Drivers (Objective 1)

The significant factors that affect the adoption of sustainability initiatives were the size of the municipality, favorable municipality environment, and the various forms of resources provided by higher levels of government.

1) Size of the municipality

Many respondents mentioned that ‘large size’ was a driver for adopting sustainability initiatives in a municipality, as suggested by previous research (i.e., Barrutia & Echebarria, 2018; Sancassiani, 2005; Homsy & Warner, 2015, etc.). However, it is not so much the size itself, but what it represents, such as the presence of resources in different forms, as suggested by Barrutia et al. (2007). For the respondents, these resources primarily were funding and the presence of staff to make decisions related to sustainability. Large size could also increase the complexity and organizational slack of the organization, positively contributing to *organizational innovativeness*. However, in the context of *the innovation process*, Barrutia and Echebarria (2018) suggested that size might be a driver in the ‘adoption’ phase of the initiatives, while they might make ‘implementation’ more difficult due to other complications faced by larger-sized municipalities, such as their different population demographics.

In some cases, respondents mentioned that smaller municipalities had adopted many initiatives, and some seemed to benefit from the initiatives introduced by regional municipalities around them. Homsy and Warner (2015) also suggested that suburban municipalities benefit from the policies introduced by their central cities. Furthermore, Kern et al. (2007) found that innovations like LA21 processes diffused faster in suburbs and neighboring cities than rural populations. Even in this case, the initiatives seem to spread from the larger municipalities to the smaller municipalities surrounding them, as suggested by the responses. Thus, the large size of the municipalities seems to host favorable conditions for the adoption of initiatives.

2) Favorable municipal environment

Another important finding that emerged through this research was that a favorable internal environment was an important predictor of the level of sustainability in a municipality. There are various aspects of a favorable internal environment, including council culture, community culture, and political orientation.

There is a difference between the municipal government's organizational culture and the culture of citizens within the municipality. Saha (2009) notes in his research that it is unclear if the local government officials had internalized their environment's culture; however, in this case, it appears that local government officials are greatly affected by the culture within the community. Among the city staff, it is because they are worried about public backlash and criticism, as suggested by some of the open-ended replies. Among the council, it is mainly because they wished to be re-elected. The views on council and community culture between Ontario and BC municipalities did not differ.

In some cases where there was a significant difference between the responses in both provinces, such as 1) BC respondents appeared to agree to a greater level to the presence of champions for initiatives than Ontario respondents for this sample 2) Municipal respondents in BC appeared to be more intrinsically motivated to adopt sustainability than municipal respondents in Ontario for this sample. The quantitative analysis also suggests that respondents from BC were more familiar with the SDGs; however, the outlier responses may have influenced the outcome in this case. Previous research has also suggested that political culture matters greatly, and more left-leaning municipalities have citizens with goals aligning with sustainability principles. Sustainability is sometimes viewed as anti-development by some (Barrutia & Echebarria, 2018), and due to this, might lack political support from some governments.

However, this research was unable to examine the effect of political leaning on the adoption of initiatives in further detail. To examine the political leaning variable in detail, it was necessary to examine the specific initiatives introduced into the municipality. This study provided an opportunity for respondents to say which initiatives they had adopted, but many were very generally worded and did not provide an idea of how strong the initiatives were in terms of sustainability.

According to Damanpour and Schneider (2009), organizations are affected by the social, political, cultural, and geographical environments in which they operate, and therefore provide organizations with opportunities or constraints. Damanpour and Schneider posit that cultural and political factors affect all three phases of innovation equally (initiation, adoption decision, and implementation) either positively or negatively. As suggested by Damanpour and Schneider (2009), the reason for this was that cultural factors might foster change, which affects the initiation sub-process. Cultural factors may also determine how the public responds to the innovation and their tolerance in the implementation sub-process. This needs to be studied in more depth in the Canadian context.

3) Aid by higher levels of government

The influence of higher levels of government was another factor that served both as a driver and as a barrier. Provincial and federal governments introduced programs and provided funding and grants for

municipalities to achieve their sustainability goals. However, in some cases, respondents mentioned how particular ‘ways of doing things’ hindered their ability to achieve their full sustainability potential. Respondents mentioned that their municipalities would like to be involved in the decision-making process for municipalities’ programs and services whenever possible and would like to be viewed as partners. This indication by the respondents agrees with what other researchers have suggested to be the most significant achievement of LA21 (e.g., Eckerberg & Dahlgren, 2007; Selman 1998). Good governance and participation from various stakeholders have contributed to the successful adoption of sustainability initiatives in past examples such as Sweden and might be promising for the future adoption of sustainability initiatives.

It was mentioned that higher-level government could ensure that rural municipalities can access services and hire experts to help them meet their sustainability goals. As Barrutia and Echebarria (2018) insisted, long-term commitment and support from higher levels of government are essential for municipalities to implement sustainability initiatives without being wary of consequences that might advance without support. One of the most stated reasons for municipalities delaying the adoption of initiatives was funding in various forms. Funding from higher levels of government could also lessen a municipality’s perception of risk.

Larger municipalities with more population had more accessibility to the programs and services from higher levels of governments. Small municipalities complained of limited access to these programs, sometimes due to distance and sometimes to the availability of such programs for their population size. Among the smaller municipalities, the rural municipalities appeared to suffer the most, without easy access to provincial and federal programs such as recycling centres. This is in contrast to the study by Homsy and Warner (2015), which suggests that rural municipalities adopt more initiatives because they are the ‘guardians’ of natural resources. However, there may be differences in what rural communities can do, and maybe they are able to support those initiatives that also have a return on investment.

One possible way for small and rural municipalities to overcome these problems would be if larger municipalities could share expert staff to work on sustainability issues and if higher levels of government provided funding and programs for this small team of experts. Such services need to be communicated to smaller municipalities to find solutions to their complex sustainability-related issues without spending too much of their limited funding to hire special staff. Organizations have accomplished this form of knowledge sharing called ‘cross staffing’ (in work by Boh (2007)), and knowledge is effectively spread through the various departments and projects in an organization (Boh, 2007; Heimerl & Kolisch, 2009). Nevertheless, further research is needed to determine whether this could apply to municipalities, as they have very different characteristics as an organization.

5.2 Other Minor Barriers and Drivers to Adopting Sustainability

1) Key individuals

The respondents indicated the presence of key individuals in connection to joining networks. In some cases, respondents noted that individuals within the council or the staff or even outside (regular citizens) were interested in implementing initiatives. Previous literature has suggested that municipalities benefit from a champion or key individual as being very important for municipalities to achieve their sustainability goals (e.g., Evans 2006, Barrutia, Aguado, and Echebarria 2007; Betsill & Bulkeley 2004). This individual could be a council member, city staff, or any citizen from the municipality; however, as suggested by Rogers (2003), these individuals do not necessarily have to be in positions of power. Nevertheless, they have a stronger ability to promote change from positions of power, such as influencing municipalities to join networks. Conversely, when there is no key individual to promote change, it can be a barrier, as indicated by one respondent.

2) Networks

In this study, the reasons given for joining networks were to gain and share knowledge and ideas. Many respondents also mentioned that the involvement in networks was also to be introduced to like-minded people and gaining legitimacy for their ideas. This contrasts with the study by Betsill and Bulkeley (2004), who suggested that municipalities are motivated more by financial and political resources than by the spread of knowledge. However, the respondents in this study may have joined the networks voluntarily, and thus their motivations may not reflect the municipality. Some respondents did not seem to know a lot about how networks functioned. This suggested that either they did not participate in the networks themselves or that the information discussed by such networks was not being communicated effectively throughout the municipality. Networks were suggested to be an essential factor in previous research (e.g., Barrutia & Echebarria, 2011, 2014, 2018). In the context of diffusion of innovations in organizations, the presence of networks would translate into system ‘openness’ as it determines how much the members of the organization would be connected to members outside the organization. System openness is positively related to organizational innovativeness; however, whether and how much the networks affect the adoption of initiatives could not be determined but is an interesting area for future research.

5.3 Sustainability knowledge of municipal authorities (Objective 3)

Many respondents also indicated possessing sufficient knowledge of sustainability and global sustainability issues. However, knowledge of the SDGs was low among the participants, with only 2.9% of the participants indicating that they were ‘very familiar’ with the SDGs. Perhaps the SDGs are not being communicated effectively to the municipalities. As Barrutia and Echebarria (2017) state, the Sustainable

Development Goals (and Agenda 21) are guiding principles applied to economic, environmental, and social welfare issues. Although there was little awareness of the SDGs, one of the respondents (BC 28) mentioned that their municipality uses the ‘resilience’ framework for decision-making and planning. So, a lack of awareness of the SDGs might not mean that municipalities do not possess sufficient knowledge of other sustainability-related frameworks.

5.4 Common initiatives (Objective 2)

Municipalities were given a list of 11 initiatives to choose from and asked which ones their municipalities had adopted. The most common initiatives adopted by municipalities in Ontario were energy efficiency measures, and the most common initiatives adopted by municipalities in BC were transportation planning initiatives. However, the opposite was expected as Ontario is considered ‘automobile-industry-dependent,’ and BC was considered ‘Hydro-electricity-rich’ (Robinson & Gore, 2005). The least common initiatives adopted by both provinces were educational progress initiatives.

Of particular importance, municipalities mentioned climate mitigation and adaptation initiatives, likely because cities are starting to feel more the effects of climate change.

Most of the mentioned initiatives are also in the realm of standard municipal initiatives (e.g., transportation planning and social housing) or could be classified as ‘low-hanging fruit,’ such as energy efficiency initiatives, that can be implemented as infrastructure needs to be replaced and that have a good return on investment. Very few municipalities mentioned other initiatives that showed a greater commitment to sustainability practices. However, the initiatives that the respondents were given to choose from were very general and included both ‘weak’ and ‘strong’ sustainability initiatives in the same category. Therefore, further investigation is required to examine if each municipality had a more profound commitment to sustainability.

5.5 Implications of the study in the context of adoption of innovation

In the context of organizational innovativeness, most variables (Figure 2.1) came out as very important in this study. *Complexity* represents the degree to which the organization members possess sufficient knowledge and expertise to adopt and implement innovations. Most municipalities reported having staff shortages and a lack of awareness of solutions and outcomes, suggesting the importance of complexity of knowledge and expertise in the organization. *Size*, *complexity*, and *organizational slack*, which are uncommitted resources available to an organization, are interrelated, as articulated by one of the interview participants:

Each municipality depending on the size has different challenges. For example, a city like Toronto, they [sic] literally have a 100 different people working on sustainability, so their concerns and

considerations would be considerably different than say a place like Clarington with 90,000 people and only one sustainability and climate change coordinator [...] the motivations and challenges in the community side of climate initiatives will be significantly different than on the corporate side of climate initiatives [...] each specific project has its own challenges, motivating factors and benefits. (IN 2).

Larger organizations have more financial capacity to appoint more staff, thereby increasing complexity and organizational slack resources. *Centralization*, which is the extent to which power is concentrated in the hands of few individuals, and *formalization*, which is the extent to which the municipality insists on following rules and procedures, could be related to municipality culture. By involving citizens in decision-making and letting citizens influence decision-making, municipalities might be able to overcome barriers placed by centralization and formalization.

In the context of *the adoption process in organization*, there is insufficient evidence to conclude which variable might affect which stage of the innovation process more powerfully. This is because it was quickly learned that a separate study of the *adoption process* is required to determine precisely which factor affected which stage of the adoption process. For example, as previously mentioned, older research suggests that some factors which make initiation simpler (like size and complexity) might make implementation more difficult. Alternatively, variables that might make initiation difficult (like centralization and formalization) might make implementation easier. Thus, more research is required to determine to what extent each factor affects the adoption process in organizations.

5.6 Limitations

Some of the questions in the survey were not as effective in measuring the desired phenomena. For example, respondents were asked if financial resources were important to them to see how financial resources impacted the adoption of initiatives. However, there was no measure in the survey to inquire if these municipalities were actually receiving enough financial resources to aid them in adopting initiatives. As another example, when municipality respondents were given a list of initiatives to choose from, most of the initiatives tended to be environmental initiatives and were very general, combining both ‘weak’ and ‘strong’ sustainability initiatives and initiatives that should be expected from a city. Even though this list was adopted from other research, it could explain why respondents claimed to have adopted more environmental initiatives than other initiatives and also listed other environmental protection initiatives. However, the open-ended text-entry boxes and the interviews provided more insight to support the results that were obtained from the survey.

Finally, respondents from some of the small municipalities mentioned that a few of the listed initiatives were not under their control. For example, respondent BC 28 noted that the Agricultural Land Commission

(ALC), a provincial authority, had legislation to protect agricultural land, which local governments could not prohibit. Some others mentioned that they were too small to implement some of the initiatives, which were usually introduced by the region to which they belonged. Nevertheless, small municipality respondents still claim to have adopted a considerable number of initiatives.

5.7 Significance and future research recommendations

Most studies of this nature focus on municipalities in a relatively homogenous context (e.g., Basque region in Spain as studied by Barrutia & Echebarria (2011)). This study attempted to study regions in two different parts of Canada to understand differences in drivers and barriers based on different political and geographical environments. This study also updated current knowledge on barriers and motivators to initiatives and checked if the factors mentioned in previous studies were valid in the Canadian context.

Based on the results of this study, the following recommendations are made:

- 1) Future studies could compare regional municipalities instead of individual municipalities as they offer more insight into a broader range of initiatives.
- 2) If a study of all municipalities in a region must be conducted, the survey must be adapted to the size of the municipality.
- 3) Since each municipality is different and faces unique issues, an in-depth study of a particular municipality and its sustainability initiatives might offer better insights into drivers and barriers.
- 4) Gustafsson and Ivner (2018) recommend that to achieve sustainability at the local level, perhaps it is not the cities themselves but the regional municipalities that have to initiate this action. The findings of this thesis are in line with that recommendation. Sustainability must not be the responsibility of municipalities alone, but a combination of lower and slightly higher levels of government that can help municipalities truly embrace their sustainability goals. Canada has a unique political and geographical environment, with a large land area and small population relative to its land base and many small municipalities. This likely spreads resources more thinly, and therefore more research is needed to determine how to best mobilize local governments to become more sustainable.

6 Conclusion

The primary aim of this study was to define the obstacles to and enablers of sustainability initiative adoption in the Canadian context. The study also sought to recognize current municipal initiatives and municipal authorities' awareness of the SDGs and sustainability.

The main factor that emerged from the qualitative survey results to affect a municipality's adoption of sustainability initiatives is its size. The size also often represents the resources held by the municipality, mainly financial and staffing capacity. Other factors that were frequently mentioned by the participants as influential include a favorable internal environment and support from higher levels of government. The presence of networks was a factor frequently mentioned in previous literature; however, except in the questions related to networks, there were no other mentions of networks. The role of key individuals was primarily mentioned in relation to networks.

This study's results reinforce previous research findings on barriers and motivators to LA21 processes, sustainability initiatives, and climate change policies and programs. Most of the factors that emerged through this research are similar to those already identified by previous literature. This study also helped uncover some problems specific to Canada, such as the inaccessibility of provincial and federal programs by small and rural municipalities, putting small and rural municipalities at a disadvantage as they often do not have the opportunities and resources to mobilize and implement sustainability initiatives. Despite the various problems elucidated by smaller municipalities, many respondents from small municipalities still claim to have adopted some initiatives, possibly through the aid of the region.

Given Canada's vast geography and relatively small population, there are many small municipalities. This is a key issue to understand concerning how to implement sustainability initiatives with low resources. Potential solutions to be explored include sharing staff to reduce the problems of staff shortages and requirement for expertise. Finally, it is suggested that through all these proclamations that 'action is initiated at the lowest level,' it is. So, the burden of local action must not be borne by the municipalities alone but must be achieved through local, regional, and provincial governments' combined efforts.

Municipal officials and staff claimed to be very knowledgeable about sustainability issues in the world and to be concerned with the future but were not too aware of the SDGs. This, along with other barriers, could limit achieving the SDGs by 2030.

In the future, drivers and barriers need to be studied by contacting experienced and expert staff in each municipality and reviewing the sustainability plans and specific initiatives that have already been adopted more closely.

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Appendices

Appendix A – Survey Recruitment Email

The translated version of this email is available below/ La version traduite de ce courriel est disponible ci-dessous

This email is being sent on behalf of the researchers:

Hello,

My name is Snehaa Suryanarayanan, and I am a master's student working under the supervision of Dr. Goretty Dias from the School of Environment, Enterprise, and Development at the University of Waterloo. We are conducting a research study to understand the barriers and motivators to adopting sustainability initiatives at the municipal level in Canada, and your insights would be very valuable to us. Your responses will be used for my master's thesis. Your identity will be kept confidential, and any contact information you may provide will be stored separately from your responses.

Participation in this survey is voluntary. You are eligible to participate if you have one of the following roles in your municipality and if you belong to a provincial municipality:

- Mayor
- Councillor
- City staff (e.g., Planning, economic department, etc.)

If you decide to participate in this study, you will be asked to complete a short online survey, which will take you approximately 10 minutes. If you choose to respond, please do so by October 15th 2020. I want to assure you that this study has been reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee (ORE#41686).

For more information on this research study and to take the online survey, please see:

https://uwaterloo.ca/1.qualtrics.com/jfe/form/SV_7R7uqLjFGxVSbFb

If you have any questions about this study, please feel free to contact me at s3suryan@uwaterloo.ca or my supervisor Dr Goretty Dias at gdias@uwaterloo.ca .

Again, thank you for your time.

Sincerely,

Snehaa Suryanarayanan

Ce courriel est envoyé au nom des chercheurs :

Bonjour,

Je m'appelle Snehaa Suryanarayanan et je suis étudiante en master sous la supervision du Dr Goretty Dias de la School of Environment, Enterprise, and Development de l'Université de Waterloo. Nous menons une étude pour comprendre les obstacles et les facteurs de motivation à l'adoption d'initiatives de durabilité au niveau municipal au Canada, et vos idées nous seraient très utiles. Vos réponses seront utilisées pour ma thèse de maîtrise. Votre identité restera confidentielle et les coordonnées que vous fournirez seront conservées séparément de vos réponses.

La participation à cette enquête est volontaire. Vous pouvez y participer si vous avez l'un des rôles suivants dans votre municipalité et si vous appartenez à une municipalité provinciale :

- Maire/Mairesse
- Conseiller
- Personnel de la ville (par exemple, service de la planification, service économique, etc.)

Si vous décidez de participer à cette étude, vous serez invité à répondre à un court sondage en ligne , qui vous prendra environ 10 minutes. Si vous choisissez de répondre, veuillez le faire d'ici le 15 Octobre 2020. Je tiens à vous assurer que cette étude a été examinée et a reçu l'approbation éthique d'un comité d'éthique de la recherche de l'Université de Waterloo (ORE#41686).

Pour plus d'informations sur cette étude et pour répondre à l'enquête en ligne, veuillez consulter

https://uwaterloo.ca/qualtrics.com/jfe/form/SV_7R7uqLjFGxVSbFb

Si vous avez des questions au sujet de cette étude, n'hésitez pas à communiquer avec moi à l'adresse s3suryan@uwaterloo.ca ou ma professeure Dr Goretty Dias à gdias@uwaterloo.ca .

Encore une fois, merci de votre temps.

Cordialement,

Snehaa Suryanarayanan

Appendix- B Consent Information

Title: Barriers and Drivers to Adopting Sustainability Initiatives at the Municipal Level in Canada

Faculty Supervisor: Dr Goretty Dias, School of Environment, Enterprise, and Development, University of Waterloo. Email: gdias@uwaterloo.ca

Graduate Student Investigator: Snehaa Suryanarayanan, School of Environment, Enterprise, and Development, University of Waterloo. Email: s3suryan@uwaterloo.ca

The following section provides you with information about the study so you can make an informed decision about participating. The request for consent to participate and the link to the survey are found at the end of this information section.

You are invited to participate in a research study to understand the state of sustainability initiatives in Canadian municipalities. The objective of the research is to identify barriers and drivers for the adoption of sustainability initiatives at the municipal level. This research is for a master's level research thesis

Your responses may help us identify the current state of sustainable development within municipalities in Canada, and would be valuable to the research community at large, and possibly for implementing policies for driving sustainable development.

Participation in this survey is completely voluntary. However, in order to take the survey, the participant must belong to one of the provincial municipalities. If you decide to participate, you will be asked to complete a short online survey (about 10 minutes long), that asks questions about drivers, barriers, and the extent to which your municipality has adopted sustainability initiatives. You may omit any question you do not wish to answer, except for the first question ("which municipality are you from?" - we are using this information to see if the characteristics of the municipality has an effect on adoption. We will only discuss the aggregate provincial findings in the research.), and you can withdraw your participation at any time by not submitting your responses. We will also be gathering some demographic information, such as age, sex, and level of education to see their effects on adoption of initiatives as well. Your identity will be kept confidential, and only the aggregate findings will be used for the development of the thesis by the student researcher. Any statements which you may provide will not be quoted, but only analysed for content along with other respondents. The data collected through this study will be kept by the student and faculty supervisor conducting the research on a password-protected and encrypted drive or computer.

We hope that this study will provide insights into how municipalities can accelerate local sustainability. Participation in this study may not be of personal benefit to you, however, if you wish to receive a summary of the study results, you are invited to leave your contact information at the end of the survey, which will be stored separately from the rest of your responses. There may be minimal risks to participating in this

survey. You will be completing the study by an online survey powered by Qualtrics. When information is transmitted or stored on the internet privacy cannot be guaranteed. There is always a risk your responses may be intercepted by a third party (e.g., government agencies, hackers). Qualtrics temporarily collects your [company/contributor] ID and computer IP address to avoid duplicate responses in the dataset but will not collect information that could identify you personally. There is a very small possibility that a motivated individual may be able to ascertain your identity and/or the identity of the community due to the municipality name being required for the study. The researchers will not be naming municipalities in reports etc. and when results are reported they will be reported in aggregate to minimize this possibility. Research data will be retained for minimum of one year and erased once the study is completed.

If you have any questions, or would like additional information to assist you in reaching a decision about participation, please feel free to contact Dr Goretty Dias (gdias@uwaterloo.ca) or Snehaa Suryanarayanan (s3suryan@uwaterloo.ca).

This study has been reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee (ORE#41686). If you have questions for the Committee contact the Office of Research Ethics, at 1-519-888-4567 ext. 36005 or ore-ceo@uwaterloo.ca

Thank you for considering participation in this study.

Consent of Participant

By providing your consent, you are not waiving your legal rights or releasing the investigator(s) or involved institution(s) from their legal and professional responsibilities.

With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

"I agree to participate."

"I do not wish to participate (please close your web browser now)."

Titre : Obstacles et facteurs à l'adoption d'initiatives de durabilité au niveau municipal au Canada

Professeur(e) responsable: Dr Goretty Dias, School of Environment, Enterprise, and Development, University of Waterloo. Courriel: gdias@uwaterloo.ca

Chercheuse étudiante diplômée: Snehaa Suryanarayanan, School of Environment, Enterprise, and Development, University of Waterloo. Courriel: s3suryan@uwaterloo.ca

La section suivante vous fournit des renseignements sur l'étude afin que vous puissiez prendre une décision éclairée au sujet de votre participation. La demande de consentement à participer et le lien vers le sondage se trouvent à la fin de cette section d'information.

Nous vous invitons à participer à une étude de recherche pour comprendre l'état des initiatives de durabilité dans les municipalités canadiennes. L'objectif de la recherche est de cerner les obstacles et les facteurs à l'adoption d'initiatives de durabilité au niveau municipal. Cette recherche est pour une thèse de maîtrise.

Vos réponses pourraient nous aider à déterminer l'état actuel du développement durable dans les municipalités du Canada, et elles seraient utiles pour le milieu de la recherche en général, et peut-être pour la mise en œuvre de politiques favorisant le développement durable.

La participation à cette enquête est entièrement volontaire. Toutefois, pour répondre au sondage, le participant doit appartenir à l'une des municipalités provinciales. Si vous décidez de participer, vous serez invité à remplir une courte enquête en ligne (d'une durée d'environ 10 minutes), qui pose des questions sur les conducteurs, les obstacles et la mesure dans laquelle votre municipalité a adopté des initiatives de durabilité. Vous pouvez omettre toute question à laquelle vous ne souhaitez pas répondre, sauf la première question (« De quelle municipalité êtes-vous? » - nous utiliserons ces informations pour voir si les caractéristiques de la municipalité ont un effet sur l'adoption. Nous ne discuterons que des résultats provinciaux agrégés de la recherche.), et vous pouvez retirer votre participation à tout moment en ne soumettant pas vos réponses. Nous recueillerons également des données démographiques, comme l'âge, le sexe et le niveau de scolarité, pour voir leurs effets sur l'adoption. Votre identité restera confidentielle, et seules les conclusions agrégées seront utilisées pour le développement de la thèse par la chercheuse étudiante. Toutes les déclarations que vous pouvez fournir ne seront pas citées, mais seulement analysées pour le contenu avec d'autres répondants. Les données recueillies dans le cadre de cette étude seront conservées par l'étudiante et la professeure responsable de la recherche sur un lecteur ou un ordinateur protégé par mot de passe et chiffré.

Nous espérons que cette étude permettra de comprendre comment les municipalités peuvent accélérer la durabilité locale. La participation à cette étude pourrait ne pas vous être utile personnellement. Si vous souhaitez recevoir un résumé des résultats de l'étude, nous vous invitons à laisser vos coordonnées à la fin du sondage, qui seront conservées séparément du reste de vos réponses... La participation à cette enquête peut comporter des risques minimes. Vous répondrez à l'étude par une enquête en ligne réalisée par Qualtrics. Lorsque des informations sont transmises ou stockées sur l'internet, la confidentialité ne peut être garantie. Il existe toujours un risque que vos réponses soient interceptées par un tiers (par exemple, des organismes gouvernementaux, des pirates informatiques). Qualtrics recueille temporairement votre ID [société/contributeur] et l'adresse IP de votre ordinateur pour éviter les réponses en double dans l'ensemble

de données, mais ne recueille pas d'informations qui pourraient vous identifier personnellement. Il y a une très faible possibilité qu'une personne motivée puisse vérifier votre identité et/ou l'identité de la collectivité en raison du nom de la municipalité et de la possibilité d'interception par un tiers. Les chercheurs ne nommeront pas les municipalités dans les rapports, etc. et, lorsque les résultats seront communiqués, ils le seront sous forme agrégée afin de minimiser cette possibilité. Les données de recherche seront conservées pendant au moins un an et effacées une fois l'étude terminée.

Si vous avez des questions ou si vous souhaitez obtenir des renseignements supplémentaires pour vous aider à prendre une décision au sujet de la participation, n'hésitez pas à communiquer avec Dr Goretty Dias (gdias@uwaterloo.ca) ou Snehaa Suryanarayanan (s3suryan@uwaterloo.ca).

Cette étude a été examinée et a reçu l'approbation éthique d'un comité d'éthique de la recherche de University of Waterloo (ORE#41686). Si vous avez des questions pour le comité, contactez le bureau d'éthique de la recherche, au 1-519-888-4567 poste 36005 ou ore-ceo@uwaterloo.ca

Merci d'envisager de participer à cette étude.

Consentement du participant

En fournissant votre consentement, vous ne renoncez pas à vos droits légaux ou ne libérez pas l'enquêteur ou les institutions concernées de leurs responsabilités légales et professionnelles.

En toute connaissance de cause, je suis d'accord, de mon plein gré, pour participer à cette étude.

« J'accepte de participer ».

« Je ne souhaite pas participer (veuillez fermer votre navigateur web maintenant).»

Appendix- C Copy of Survey

Screening question will be displayed- Please select the province you are from

After which:

1. Which municipality are you from? _____ (We require this information to see if characteristics of the municipality itself, such as size, has an effect on adoption)

2. Please enter your role in the municipality:
 - Mayor
 - Councillor
 - Other please specify (e.g.: Planning department)

For the purpose of this study, we adopt the following definition of sustainable development – “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

Examples of sustainability initiatives include:

1. Environmentally sensitive area protection (Environmental dimension)
2. Tax incentives for environmentally friendly development (Economic dimension)
3. Youth opportunity and anti-gang programs (Social justice and equity dimension)

3. Please indicate how important the following factors are when your municipality is faced with a decision either to adopt or abandon a sustainability initiative (similar to the initiatives mentioned in the example previously provided).

i) Not at all important ii) Slightly Important iii) Moderately important iv) Very important v) Extremely important

- a) Enhancing the reputation and credibility of the municipality
- b) Gaining recognition and awards for sustainable municipalities
- c) Financial resources from the provincial / federal government for sustainability initiatives
- d) Training and human resources from the provincial/ federal governments
- e) Incentives (e.g.: tax breaks, project funding) from the provincial/ federal governments
- f) Strength of citizen engagement in sustainability

4. How familiar are you with the UN's Sustainable Development Goals (SDGs)?

i) Not at all familiar ii) Slightly familiar iii) Moderately familiar iv) Very familiar v) Extremely familiar

5. Does your municipality have a specific person or office dedicated to sustainability? (e.g. sustainability advisory committee, climate office, etc.)

i) We have a committee/office ii) We have a person iii) We have neither iv) Other please specify ____ v) I do not know

6. Please indicate the relevance of the following factors are when your municipality is faced with a decision either to adopt or abandon a sustainability initiative (similar to the initiatives mentioned in the example previously provided).

i) Very irrelevant ii) Somewhat irrelevant iii) Neither relevant nor irrelevant iv) Somewhat relevant iv) Very relevant

- a) Existing sustainability 'culture' in my municipality
- b) A long history of implementing sustainability initiatives in the past which has served as a knowledge base
- c) Rallies/ concerns expressed by citizens regarding the adoption of initiatives
- d) Freedom to act when it comes to the adoption of sustainability initiatives at the municipal level
- e) Increasing citizen participation in initiatives

7. Please indicate your level of agreement with the following statements

i) Strongly disagree ii) Somewhat disagree iii) Neither agree nor disagree iv) Somewhat agree v) Strongly agree

- a) Implementing sustainability initiatives in my municipality has the potential to influence other municipalities to adopt similar initiatives
- b) I actively seek information regarding sustainable development whenever possible
- c) People within the municipal government are keen to implement sustainability initiatives and are often ready to take charge of the discussion
- d) I believe I possess a fair amount of knowledge regarding the sustainability issues in the world today
- e) I want to gain knowledge from the process of adopting sustainability initiatives if there are opportunities or regular updates
- f) I believe I possess a fair amount of knowledge about the environment, equity, and economic dimensions of sustainability and how they influence each other
- g) I am aware of sustainability problems that exist, and I am interested in preventing/ mitigating them
- h) I believe the Earth has very limited room and resources and so we must protect it from further human damage
- i) The environment is a low priority for me compared with a lot of other concerns

8. My municipality prefers to 'wait and see' when there are specific proposals for sustainability initiatives. (Note: There may be an additional question based on your response).

i) Strongly disagree ii) Somewhat disagree iii) Neither agree nor disagree iv) Somewhat agree v) Strongly agree

8 B. Why is 'wait and see' the case? (e.g.: lack of funding, lack of knowledge for the specific initiative etc.) (If respondent chooses agree /strongly agree)

_____ -

9. Which of the following networks does your municipality participate in? Check all that apply.

- FCM (Federation of Canadian Municipalities)
- ICLEI (Local Governments for sustainability)
- I am unsure

10. If there are any other sustainability networks that your municipality /city council /city staff participate in (e.g.: Climate Caucus), please specify:

11. Why did you/ your municipality choose to join the network?

12. How often do the members of the network meet either remotely or in person?

i) Rarely (once a year or less) ii) Sometimes (twice a year or less) iii) Often (4 times per year) iv) Very often (once a month or more) v) I do not know

13. Indicate your level of agreement with this statement: Members of these networks have contributed to valuable ideas when my municipality was considering adopting sustainability initiatives.

j) Strongly disagree ii) Somewhat disagree iii) Neither agree nor disagree iv) Somewhat agree v) Strongly agree

14. In this final portion of the survey, you will be shown a list of initiatives. Please select the initiatives that have been recently adopted (or are in the process of being adopted) in your municipality.

Energy efficiency initiatives

e.g. i) Energy conservation initiatives

ii) Alternative energy initiatives

iii) Green building initiatives

Transportation planning initiatives

e.g. i) Limits to downtown parking

ii) Operation & promotion of public transit

iii) Bicycle & pedestrian oriented development

- Pollution prevention initiatives
 - e.g. i) Household waste recycling
 - ii) Industrial recycling efforts
 - iii) Air/ water pollution reduction efforts
 - Open space and Natural resource protection initiatives
 - e.g. i) Zoning used to delineate environmentally sensitive areas
 - ii) Wildlife habitat zoning
 - Sustainable economic growth initiatives
 - e.g. i) Brownfield redevelopment
 - ii) Tax incentives for environmentally friendly developments
 - iii) Supporting local businesses
 - Social justice and equity initiatives
 - e.g. i) Affordable housing
 - ii) Homeless prevention and intervention program
 - iii) Women/ minority business community development corporations
 - Tracking progress on various initiatives
 - e.g. i) Indicators to track initiatives in the last 5 years
 - ii) Sustainability progress reports in the last 5 years
 - Public Health Initiatives
 - e.g. i) Disease response programs
 - ii) Mental health awareness
 - iii) Obesity, senior health improvement initiatives etc
 - Food and agricultural initiatives
 - e.g. i) Agricultural protection zoning
 - ii) Support for local fishing and farming through infrastructure, bylaws etc
 - Governance measures
 - e.g. i) Encouraging public participation (public hearings, neighbourhood groups etc)
 - ii) Involvement of the business community
 - Educational progress initiatives
 - e.g. i) Initiatives to improve quality of education
 - ii) Environmental education programs for communities
- Any other initiatives not listed which you would like to specify_____

15. Please select your age group

- 18-25

- 26-35
- 36-45
- 46-55
- 56-65
- 66+

16. Please indicate your sex:

- Male
- Female
- Other please specify _____
- Prefer not to say

17. What is the highest degree or level of school you have completed? If currently enrolled, please select the qualification you will be receiving

- High school graduate, diploma, or the equivalent (for example: GED)
- Some college credit, no degree
- Trade/technical/vocational training
- Associate degree
- Bachelor's degree
- Master's degree
- Professional degree
- Doctorate degree
- Other please specify _____

18. Do you have any other thoughts or statements regarding the adoption of sustainability initiatives in your municipality?

19. If you would like more information about the study, please enter your email (Your email will be stored separately from the rest of your responses)

Screening question will be displayed

After which

Enquête

Q1 : De quelle municipalité êtes-vous? _____ (Nous avons besoin de cette information pour voir si les caractéristiques de la municipalité elle-même, comme la taille, ont un effet sur l'adoption.)

Q2 : Veuillez entrer votre rôle dans la municipalité

- Maire
- Conseiller (ère)
- Autre rôle, veuillez préciser (personnel municipal) _____

Pour les besoins de cette étude, nous adoptons la définition suivante du développement durable <<**Le développement durable est un mode de développement qui répond aux besoins des générations présentes sans compromettre la capacité des générations futures de répondre aux leurs.**>>

Exemples d'initiatives de durabilité :

1. Protection des zones écologiquement sensibles (dimension environnementale)
2. Incitations fiscales pour un développement respectueux de l'environnement (dimension économique)
3. Programmes d'opportunités pour les jeunes et programmes antigang (dimension de justice sociale et d'équité)

Q3 : Veuillez indiquer l'importance des facteurs suivants lorsque votre municipalité est confrontée à une décision entre adopter ou abandonner une initiative de développement durable. (Semblable aux initiatives mentionnées dans l'exemple ci-dessus).

*1) Pas du tout important 2) Légèrement important 3) Importance modérée
4) Très important 5) Extrêmement important 6) Je ne sais pas*

- a) Améliorer la réputation et la crédibilité de la municipalité
- b) Reconnaissance et récompenses pour des municipalités durables
- c) Ressources financières du gouvernement provincial/ fédéral pour les initiatives de durabilité
- d) Formation et ressources humaines du gouvernement provincial/fédéral
- e) Incitatifs (p. ex., allègements fiscaux, financement de projets) du gouvernement provincial/ fédéral
- f) Force de l'engagement des citoyens en matière de durabilité

Q4 : Connaissez-vous les Objectifs de développement durable (ODD) des Nations Unies (l'ONU) ?

*1) Pas familier du tout 2) Légèrement familier 3) Modérément familier
4) Très familier 5) Extrêmement familier*

Q5 : Votre municipalité a-t-elle une personne ou un bureau spécialisé dans la durabilité? (P. ex., comité consultatif sur la durabilité, bureau du climat, etc.)

1) Nous avons un comité ou un bureau 2) Nous avons une personne

3) Nous n'avons ni 4) Je ne sais pas 5) Autre, veuillez préciser

Q6 : Veuillez indiquer la pertinence des facteurs suivantes lorsque votre municipalité est confrontée à une décision entre adopter ou abandonner une initiative de développement durable. (Semblable aux initiatives mentionnées dans l'exemple ci-dessus).

1) Extrêmement peu pertinent 2) Assez peu pertinent 3) Ni pertinent ni non pertinent 4) Assez pertinent 5) Extrêmement pertinent

- a) La « culture » de la durabilité dans ma municipalité
- b) Une longue histoire de mise en œuvre d'initiatives de durabilité dans le passé qui a servi de base de connaissances
- c) Rassemblements/préoccupations exprimés par les citoyens concernant l'adoption d'initiatives
- d) Liberté d'agir en matière d'adoption d'initiatives de durabilité au niveau municipal
- e) Accroître la participation des citoyens aux initiatives

Q7 : Veuillez indiquer votre niveau d'accord avec les assertions suivantes

1) Fortement en désaccord 2) Plutôt en désaccord 3) Ni en d'accord ni en désaccord 4) Plutôt d'accord 5) Tout à fait d'accord

- a) La mise en œuvre d'initiatives de durabilité dans ma municipalité pourrait inciter d'autres municipalités à adopter des initiatives similaires.
- b) Les personnes au sein du gouvernement municipal sont désireuses de mettre en œuvre des initiatives de développement durable et sont souvent prêts à prendre en charge la discussion
- c) Je veux acquérir des connaissances sur le processus d'adoption d'initiatives de durabilité s'il y a des occasions ou des mises à jour régulières.
- d) Je suis conscient(e) des problèmes de durabilité qui existent, et je suis intéressé(e) à les prévenir / atténuer
- e) Je cherche activement de l'information sur le développement durable dans la mesure du possible.
- f) Je crois posséder une bonne quantité de connaissances concernant les problèmes de durabilité dans le monde aujourd'hui
- g) Je crois posséder une bonne connaissance des dimensions de l'environnement, de l'équité et de l'économie de la durabilité ainsi que leur influence mutuelle.
- h) Je pense que la Terre a une place et des ressources très limitées et nous devons donc la protéger contre d'autres dommages humains.
- i) L'environnement est une priorité faible pour moi par rapport à beaucoup d'autres préoccupations

Q8 : Ma municipalité préfère « attendre et voir » quand il y a des propositions spécifiques pour des initiatives de durabilité. (Remarque : Il pourrait y avoir une question supplémentaire en fonction de votre réponse).

- 1) Fortement en désaccord 2) Plutôt en désaccord 3) Ni en d'accord ni en désaccord
4) Plutôt d'accord 5) Tout à fait d'accord*

Q8 B : Pourquoi "attendre et voir" le cas? (P. ex., manque de financement, manque de connaissances pour l'initiative particulière, etc.)

Q9 : Dans lequel des réseaux suivants votre municipalité participe-t-elle? Cochez toutes les réponses qui s'appliquent

- Fédération canadienne des municipalités
 ICLEI – Gouvernements locaux pour le développement durable
 Je ne sais pas

Q10 : Si votre municipalité, votre conseil municipal ou votre personnel municipal participe à d'autres réseaux de développement durable (p. ex., caucus sur le climat), veuillez préciser _____

Q11 : Pourquoi avez-vous / votre municipalité choisi de rejoindre le réseau?

Q12 : À quelle fréquence les membres du réseau se rencontrent-ils à distance ou en personne?

- 1) Rarement (une fois par année ou moins) 2) Parfois (deux fois par an)
3) Souvent (quatre fois par année) 4) Très souvent (une fois par mois ou plus)
5) Je ne sais pas*

Q13 : Indiquez votre degré d'accord avec cet énoncé : Les membres de ces réseaux ont contribué à la formulation d'idées utiles lorsque ma municipalité envisageait d'adopter des initiatives de développement durable.

- 1) Fortement en désaccord 2) Plutôt en désaccord 3) Ni en d'accord ni en désaccord
4) Plutôt d'accord 5) Tout à fait d'accord 6) Je ne sais pas*

Q14 : Dans cette dernière partie de l'enquête, une liste d'initiatives vous sera présentée. Veuillez sélectionner les initiatives qui ont été récemment adoptées (ou qui sont en voie d'être adoptées) dans votre municipalité.

- Initiatives d'efficacité énergétique
p. ex., i) Initiatives de conservation de l'énergie
ii) Initiatives énergétiques alternatives
iii) Initiatives de construction écologique

- Initiatives de planification des transports
 - p. ex., i) Limites au stationnement au centre-ville
 - ii) Exploitation et promotion du transport en commun
 - iii) Développement axé sur le vélo et les piétons
- Initiatives de prévention de la pollution
 - p. ex., i) Recyclage des déchets ménagers
 - ii) Efforts de recyclage industriel
 - iii) Efforts de réduction de la pollution de l'air et de l'eau
- Initiatives en matière d'espace ouvert et de protection des ressources naturelles
 - p. ex., i) Zonage utilisé pour délimiter les zones sensibles sur le plan environnemental
 - ii) Zonage des habitats de la faune et de la flore
- Initiatives de croissance économique durable
 - p. ex., i) Réaménagement de friches industrielles
 - ii) Incitations fiscales pour des aménagements respectueux de l'environnement
 - iii) Soutenir les entreprises locales
- Initiatives de justice sociale et d'équité
 - p. ex., i) Logement abordable
 - ii) Programme de prévention et d'intervention pour les sans-abris
 - iii) Sociétés de développement des communautés d'entreprises féminines ou minoritaires
- Suivi des progrès de diverses initiatives
 - i) Indicateurs de suivi des initiatives des 5 dernières années
 - ii) Rapports d'étape sur la durabilité au cours des 5 dernières années
- Initiatives de santé publique
 - p. ex., i) Programmes d'intervention en cas de maladie
 - ii) Sensibilisation à la santé mentale
 - iii) Obésité, initiatives d'amélioration de la santé des personnes âgées, etc.
- Initiatives alimentaires et agricoles
 - p. ex., i) Zonage de protection agricole
 - ii) Soutien à la pêche et à l'agriculture locales par des infrastructures, des règlements, etc.
- Mesures de gouvernance
 - p. ex., i) Encourager la participation du public (audiences publiques, groupes de quartier, etc.)
 - ii) Participation du milieu des affaires
- Initiatives de progrès en éducation
 - p. ex., i) Initiatives visant à améliorer la qualité de l'éducation
 - ii) Programmes d'éducation environnementale pour les collectivités
 Toute autre initiative non énumérée que vous aimeriez préciser

Q15 : Veuillez sélectionner votre groupe d'âge

- a) 18-25 b) 26-35 c) 36-45 d) 46-55 e) 56-65 f) 66+

Q16 : Veuillez sélectionner votre sexe

- a) Homme
b) Femme
c) Autre veuillez préciser
d) Je préfère ne pas dire

Q17 : Quel est le diplôme ou le niveau d'études le plus élevé que vous avez obtenu? Si vous êtes actuellement inscrit, veuillez sélectionner la qualification que vous recevrez.

- Diplôme d'études secondaires ou l'équivalent (par exemple : GED)
- Un crédit universitaire, pas de diplôme
- Formation professionnelle /technique
- Diplôme d'associé
- Bachelier
- Diplôme de maîtrise
- Diplôme professionnel
- Doctorat
- Autre, veuillez préciser

Q18: Avez-vous d'autres réflexions ou déclarations concernant l'adoption d'initiatives de développement durable dans votre municipalité?

Q19. Si vous souhaitez obtenir de plus amples renseignements sur l'étude, veuillez entrer votre courriel (Votre courriel sera conservé séparément du reste de vos réponses.) _____

Appendix – D Additional Tables and Graphs

Table A- Summary statistics for the age of the respondents

(Median= 3, Mean= 2.78, IQR= 2, SD= 1.28)

Age	Frequency	Percent
26-35	38	18.4
36-45	50	24.3
46-55	52	25.2
56-65	35	17.0
66+	24	11.7
Total	199	96.6
Missing	7	3.4
	206	100.0

Table B- Summary statistics for the sex of the respondents

(Median= 2, Mean= 1.59, IQR= 1, SD= 0.504)

Sex	Frequency	Percent
Female	83	40.3
Male	115	55.8
Other (please specify)	1	.5
Total	199	96.6
Missing	7	3.4
	206	100.0

Table C- Summary statistics of responding municipalities by size (only 1 respondent per municipality)

Size	Frequency	Percent
Rural	12	8.6
Small without density	35	25.0
Small with density	55	39.3
Medium	18	12.9
Large	19	13.6
Total	139	99.3
System	1	.7
	140	100.0

Table D- Familiarity with the SDGs

(Median= 2, Mean= 2.26, IQR= 2, SD= 1.07)

Familiarity with SDGs	Frequency	Percent
Not familiar at all	59	28.6
Slightly familiar	67	32.5
Moderately familiar	53	25.7
Very familiar	21	10.2
Extremely familiar	6	2.9
Total	206	100.0

Table E- Presence of Key Individuals

(Median= 4, Mean= 3.42, IQR= 1; SD= 1.06)

Agreement level to the presence of key individuals	Frequency	Percent
Strongly disagree	11	5.3
Somewhat disagree	31	15.0
Neither agree nor disagree	50	24.3
Somewhat agree	87	42.2
Strongly agree	26	12.6
Valid Total	205	99.5
Missing	1	.5
Total	206	100.0

Table F- Increasing citizen Participation

(Median= 4, Mean= 4.05, IQR=1, SD= 0.91)

Increasing citizen participation through adoption of initiatives	Frequency	Percent
Extremely irrelevant	3	1.5
Somewhat irrelevant	16	7.8
Neither relevant nor irrelevant	12	5.8
Somewhat relevant	105	51.0
Extremely relevant	63	30.6
Valid Total	199	96.6
Missing	7	3.4
Total	206	100.0

Table G- Office or person for sustainability

Office or person for sustainability	Frequency	Percent
We have a committee / office	20	14.3
We have a person	16	11.4
We have neither	77	55.0
Other please specify	25	17.9
I do not know	2	1.4
Total	140	100.0

Table H- Respondent seeks knowledge through the adoption of initiatives

(Median= 4, Mean= 4.26, IQR=1, SD= 0.706)

Respondent seeks knowledge through adoption	Frequency	Percent
Somewhat disagree	3	1.5
Neither agree nor disagree	22	10.7
Somewhat agree	98	47.6
Strongly agree	81	39.3
Valid Total	204	99.0
Missing	2	1.0
Total	206	100.0

Table I- Municipality’s propensity to ‘wait and see’ before the introduction of new initiatives
 (Median= 3, Mean= 2.90, IQR= 2, SD= 1.14)

Municipality’s propensity to ‘wait and see’	Frequency	Percent
Strongly disagree	21	10.2
Somewhat disagree	65	31.6
Neither agree nor disagree	45	21.8
Somewhat agree	59	28.6
Strongly agree	14	6.8
Valid Total	204	99.0
Missing	2	1.0
Total	206	100.0

Table J- Number of initiatives adopted by size

Grouped number of initiatives				
Size	0,1 or 2 initiatives	3,4,5 initiatives	6,7,8 initiatives	9,10,11 initiatives
Rural	0	5	5	1
Small without density	9	10	11	2
Small with density	8	20	15	11
Medium	0	1	8	9
Large	0	3	5	11
	17	39	44	34

Table K- Sample Kish-Grid

Municipality (Set)	Number of responses from the municipality (set)			
	One	Two	Three	Four
1	1	1	1	1
2	1	2	2	2
3	1	1	3	3
4	1	2	1	4
5	1	1	2	1
6	1	2	3	2
7	1	1	1	3
8	1	2	2	4
9	1	1	3	1
10	1	2	1	2
11	1	1	2	3
12	1	2	3	4
13	1	1	1	1
14	1	2	2	2
15	1	1	3	3
16	1	2	1	4
17	1	1	2	1
18	1	2	3	2
19	1	1	1	3
20	1	2	2	4
21	1	1	3	1
22	1	2	1	2
23	1	1	2	3
24	1	2	3	4
25	1	1	1	1
26	1	2	2	2
27	1	1	3	3
28	1	2	1	4
29	1	1	2	1
30	1	2	3	2