Evaluating Public Participation in Canadian Municipal Climate Change Adaptation Plans

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Abstract

This research employs a qualitative content analysis to evaluate public participation in municipal climate adaptation plans in Canada. I conducted quantitative scoring and qualitative coding based on the assessment framework adapted from Uittenbroek et al. (2019). The framework highlights three dimensions of public participation: (a) Who participates, (b) When, and (c) How. This study highlights four key findings. First, the majority of plans do not engage with a wide range of community stakeholders, suggesting that the complete representation of community interests is not being included. Second, participation is occurring throughout the planning process in half of the plans, demonstrating a need to increase the number of opportunities for participation. Third, plans were inconsistent in clearly articulating whether participation influenced decision-making in plan development. Finally, plans are inconsistent in their application of the quantity and variety of participation mechanisms. These findings offer insight into public participation in Canadian municipal adaptation planning.

Keywords: Adaptation planning, public participation, municipal government

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Introduction

Anthropogenic climate change poses an imminent threat to Earth's populations and ecosystems. Since the beginning of industrialization, atmospheric concentrations of carbon dioxide, methane and nitrous oxide have increased exponentially (IPCC, 2021). These atmospheric changes influence the entire climate system, and effect Earth's global temperature (Burch & Harris, 2014). As global temperatures increase, the intensity and frequency of extreme climate events surge (Davoudi et al., 2009). Climate change has caused devastation to human and wildlife populations, ecosystems, and infrastructure (Davoudi et al., 2009). While mitigation strategies can, and should, be employed to reduce emissions, many climate change impacts are already locked in and will be irreversible for hundreds to thousands of years (IPCC, 2021). In response, adaptation to climate change is necessary (IPCC, 2022).

The purpose of climate change adaptation is to reduce the negative impacts of a changing climate, while capitalizing on opportunities (Bowron & Davidson, 2011). The United Nations Framework Convention on Climate Change (UNFCCC) defines adaptation as "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" (Kuyper et al., 2018). The need for adaptation has been recognized on an international scale and is a focal point of global climate policy discourse.

Within Canada, the federal government offers high-level direction regarding adaptation to climate change, however, municipalities largely undertake adaptation planning and implementation (Feist et al., 2020). Municipal governments are responsible for the development of climate adaptation plans, which contain site specific measures and strategies for climate adaptation that consider each municipality's distinct circumstance. Responses to climate change need to be tailored to a municipality's specific needs, as effective climate adaptation considers geographical, political and social contexts. The need for local, contextualized climate adaptation is well recognized in climate scholarship (Orderud & Naustdalslid, 2020; Bhardwaj 2021).

Successful adaptation planning is rooted in effective and equitable public participation (Cloutier et al., 2015; Meerow & Woodruff, 2020). While there are many definitions of public participation in the context of climate planning, the term generally refers to "various forms of interaction with people, from informing and listening through dialogue, debate, and analysis, to implementing jointly agreed solutions" (Hügel & Davies, 2020, p. 2). Public participation has long been considered a foundation for successful plan implementation (Burby, 2003; Few et al., 2007). Adaptation is designed to meet the needs of local people, therefore putting them at the centre of the planning process is essential (Pelling & Garschagen, 2019). Involving the community strengthens adaptation planning and ultimately is considered to be vital to successful adaptation (Cloutier et al., 2015; Meerow & Woodruff, 2020; Susskind & Kim, 2021). Participation mechanisms that specifically seek to include traditionally marginalized groups are needed to ensure that the experiences, values, and aspirations of underrepresented groups are prioritized, and to address systemic structural inequalities (Fitzgibbons & Mitchell, 2019).

Public participation not only strengthens adaptation planning, but also offers co-benefits such as contributing to a greater understanding of context (Baird et al., 2014; Cloutier et al., 2015). While climate change is a global phenomenon, the impacts are highly contextual and diverse (Susskind, 2010; Butler et al., 2015). In addition to variation across geographical locations, political and social structures also interact to influence exposure to climactic events, adaptive capacity, and vulnerability to climate change (Blythe et al. 2014). Because climate impacts are local, adaptation is considered a community issue, and therefore context is critical (Butler et al., 2015; Susskind & Kim, 2021). Experts have demonstrated the need for public participation to better account for context in adaptation planning (Wesche & Armitage, 2013; Mitchel & Laycock, 2019; Meerow & Woodruff, 2020). Engaging with local perspectives provides nuanced understandings of local context and thus informs the development of locally appropriate solutions (Wesche & Armitage, 2013; Susskind & Kim, 2021). Furthermore, marginalized and vulnerable groups should not be excluded from decision-making, as the inclusion of these groups throughout development, planning, and implementation provides a broader understanding of local context, and is therefore beneficial (Roberts & Pelling, 2018).

Public participation in adaptation planning can also ensure that local concerns are reflected in adaptation actions (Burton & Mustelin, 2013; Camponeschi, 2021). There is a robust literature underlining the importance of placing the community in the role of decision-makers, and of acknowledging diverse perspectives (Few et al., 2007; Bohnet, 2015; Cloutier et al., 2015; Fitzgibbons & Mitchell, 2019). Involving the public accounts for the needs of various populations within a municipality (Susskind & Kim, 2021). For example, providing marginalized groups the opportunity to voice their own priorities and aspirations can contribute to alleviating misrepresentation and to the development of more appropriate adaptation actions (Fitzgibbons & Mitchell, 2019).

Effective public participation in adaptation planning is not without challenges (Moser & Ekström, 2010; Hügel & Davies, 2020). The literature has shown that it is crucial to recognize the challenges inherent in efforts to engage the public in adaptation planning and to avoid simplistic assumptions about the efficacy, transparency and public reach of community participation processes (Few et al., 2007; Cloutier et al., 2015; Uittenbroek et al., 2019; Bidwell & Schweizer, 2021). Tensions pertaining to "various frames of reference, value systems, interests, and even the choice of language" may arise (Cloutier et al., 2015, p. 460). Participatory processes themselves are power laden interactions, which can silence or elevate particular voices and conceal conflicts between participants (Hügel & Davies, 2020).

While the benefits of public participation in adaptation planning are well established, questions regarding who should participate, when participation should occur within the planning process, and how to achieve the desired level of participation remain unanswered and under-researched (Bohnet, 2015; Uittenbroek et al., 2019; Meerow & Woodruff, 2020). There is also a lack of knowledge on how participation is embedded within the process of adaptation planning, how to transfer commitments to participation into practice, and how to evaluate the efficacy of public participation (Burton & Mustelin, 2013; Hügel & Davies, 2020). For example, transparency regarding participation has been identified as a major contributor to plan quality. In this context, transparency refers to clarity about how the public has been involved in the creation of an adaptation plan. Yet, there is an overwhelming lack of transparency about public

participation in municipal plans (Berke et al., 2013). In fact, a recent review of Canadian municipal climate plans found that participation was the lowest quality component of the plans, to the extent that only 40% of the assessed plans included public participation in plan development (Guyadeen et al., 2019). The same review demonstrates that broad public participation is not explicitly detailed within Canadian municipal plans (Guyadeen et al., 2019). Furthermore, the literature suggests that there are significant opportunities to advance equity in adaptation planning (Fiack et al., 2021). Therefore, essential questions pertaining to who is participating, how often they are participating, and in what capacity, need to be explored (Few et al., 2007).

In this context, the objective of my research is: *to critically evaluate public participation in municipal climate adaptation planning in Canada*. My research will focus on municipalities due to the critical role local government plays in climate adaptation and the direct impact of adaptation action on communities (Philp & Cohen, 2020; Feist et al., 2020). In the context of a rapidly changing climate, my research will generate a deeper understanding of how principles of public participation are being translated in practice, and how to strengthen participation practices to improve the effectiveness of climate adaptation.

Literature Review

Climate Adaptation

Every facet of human civilization, including infrastructure, housing, economic development, public health and food security, is susceptible to the impacts of Anthropogenic climate change (Lyles et al., 2018; IPCC, 2022). The well-being of humankind, and Earth's non-human populations, are at risk, and globally ecosystems are in imminent danger of degradation (IPCC, 2021; IPCC, 2022). Within Canada, climate impacts are widespread and vary drastically by region; sea level rise, changes in precipitation, and increased severity and frequency of extreme weather events such as drought and flooding are occurring across the country in varying degrees (Penney, 2012; Lyles et al., 2018; Susskind, 2010).

Climate change adaptation is defined as "efforts to adjust human and natural systems to minimize negative impacts arising from anthropogenic climate change" while capitalizing on opportunities presented by a changing climate (Bowron & Davidson, 2011; Lyles et al., 2018, p. 1995). These measures can be developed using a reactive or proactive approach, where reactive adaptations are in response to climate change impacts, and proactive adaptations anticipate impacts and therefor precede them (Andrews-Key et al., 2021). Adaptation can also follow a "top-down" approach, meaning it is in the hands of municipal government and other administrative bodies (Butler et al., 2015; Feist et al., 2020). In contrast "bottom-up" adaptation entails decision-making that emerges from community groups or civil society (Amaru & Chhetri, 2013; Butler et al., 2015; Brink et al., 2018). Regardless of approach, the intention of adaptation planning is to maintain the welfare of both the natural and human environment in the face of climate change (Measham et al., 2011).

For adaptation to be effective, "socio-cultural, environmental, economic and political–institutional measures" need to be implemented (Brink et al., 2018, p. 83). Adaptation measures

need to be informed by an acute understanding of local context, including the ecological variability, diversity of actors, differing social, cultural and political environments, as well as specific climate projections for each location (Amari & Chhetri, 2013; Bennet et al., 2016). For example, in a study of growing cities in India, Bhardwaj (2021) illustrates how cities experiencing rapid urbanization and economic growth cannot respond to climate change using the same methods as established cities.

In recent years, commitments to adaptation have increased substantially, and dominant governing actors such as the Intergovernmental Panel on Climate Change (IPCC) and United Nations Framework Convention on Climate Change (UNFCCC) have brought adaptation to the forefront of global climate policy (Hügel & Davies, 2020). These actors have established frameworks for understanding adaptation, as well as recommendations for national adaptation measures (Persson, 2019). The IPCC's Working Group II contributes to the Assessment Report's climate change impacts, adaptation and vulnerability (IPCC, 2022). The establishment of this group comes years after the creation of the Adaptation Fund, the development of which was a notable milestone in climate change response as it resulted in a remodelling of climate change financing (Hortsmann, 2011).

The UNFCCC is responsible for leading climate related agreements such as 1992's Kyoto Protocol and 2015's Paris Agreement (Sethamo & Harder, 2021). The evolution of these agreements showcases adaptation's advancing position on the global stage. For example, The Paris Agreement required parties to make new commitments not only to mitigation, but financing and adaptation as well, and by placing adaptation as a pillar of climate change response, the UNFCCC has cemented adaptations place in climate response (Kuyper et al., 2018).

Municipal Government as Key Players in Climate Adaptation

The impacts of climate change are experienced at the local level (Susskind, 2010; Dale et al., 2020; Measham et al., 2011). While recognizing vast heterogeneity between communities, a community's capacity for adapting to these impacts varies depending on economic, political, ecological and cultural factors, and therefore, each municipality will experience climate impacts unique to their specific circumstance (Susskind, 2010; Butler et al., 2015; Chu et al., 2015; Mcleod et al., 2015). For this reason, climate change adaptation is widely considered to be a community challenge that requires a place-based approach (Measham et al., 2011; Butler et al., 2015; Susskind & Kim, 2021).

Municipal governments in Canada are defined as the governing body for cities, towns, and districts responsible for parks, roadways, local land use, public transportation and several other matters (Canada, n.d.). Types of municipalities vary by province and territory. For example, in Ontario there are 3 types of municipalities: Upper-tier, lower-tier, and single-tier (Ontario, n.d.). Upper-tier municipalities include regions, counties and districts. Regions and counties are "federation(s) of the local, lower tier municipalities within its boundaries" and provide different services (AMO, n.d.). A district, on the other hand, is a territorial boundary, but typically is not responsible for providing any government services (AMO, n.d.). This study is concerned exclusively with local municipal government representing a single town or city, as opposed to a federation of municipalities.

Local municipal government operates in close proximity to the community through the provisioning of local services and have direct channels to local knowledge and experiences with climate change (Guyadeen et al., 2019). As the governing body nearest and most accessible to residents, municipal governments are best positioned to account for local context in adaptation planning, and are, therefore, critical for successful climate change response (Measham et al., 2011; Brink & Wamlser, 2018; Dale et al., 2018; Guyadeen et al., 2019; Philp & Cohen, 2020). Furthermore, municipal governments have jurisdiction over many public services and functions, including land-use planning, development regulation, and emergency planning and response (Vogel et al., 2018; Philp & Cohen, 2020). Given their authority over local natural, built and social infrastructure, in addition to their importance for sustaining public policy initiatives, local government is important for increasing the longevity of adaptation measures (Crabbé & Robin, 2006; Philp & Cohen, 2020).

Developing and implementing Climate Adaptation Plans (CAP) at the municipal level is becoming a standard-practice in many places around the world and within Canada. In fact, climate plans are provincially mandated in Nova Scotia (Phil & Cohen, 2020). Elsewhere, plans remain voluntary. A study conducted by the Federation of Canadian Municipalities (FCM), found that of 180 respondents, approximately 40% of municipalities had undertaken adaptation planning to some degree (McMillan et al., 2019). When a government develops a plan, they are acting on their responsibility to protect their residents (Mees et al., 2018; Guyadeen et al., 2019; Fiack et al., 2021; Susskind & Kim, 2021). Ultimately, the intention behind an adaptation plan is to reduce vulnerabilities within a municipality, and they are vital for "protecting essential infrastructure and livelihood sources, creating local emergency response plans to flooding and other hazards, and building community-level adaptive capacity" (Khan et al., 2016, p. 14). Development of an adaptation plan generally includes identifying hazards, "risks and vulnerabilities, develop[ing] goals, and [prioritizing] actions that sustain the civic quality of life" (Measham et al., 2011; Fiack et al., 2021, p. 2). Providing climate related goals for a municipality is an especially important aspect of these plans, as the goals are intended to reflect community needs, and inform adaptation strategies and decision-making (Guyadeen et al., 2019). While goals are highlighted at the beginning of planning, subsequent policies, implementation strategies and monitoring and evaluation follow and are additional core characteristics of plans (Guyadeen et al., 2019).

Importance of Community Participation for Climate Adaptation

Collaboration between planning authorities, such as municipal governments, and the public is a best practice in climate change adaptation (Amaru & Chhetri, 2013; Feist et al., 2020; Bidwell & Schweizer, 2021; Rivas et al., 2021). Adaptation itself has at times been defined as "a function of the flow of knowledge between various institutions and communities" (Amaru & Chhetri, 2013, p. 129). While acknowledging that there is no singular definition of public participation, this study adopts the definition by Few et al. (2020): "*securing the active involvement of a broad range of stakeholders in decision-making and action... Here we focus principally on public participation in decision-making processes coordinated by governmental institutions and other agencies – rather than on processes emerging directly from the grassroots*" (p. 47).

There are varying levels of participation. This study recognizes the framework of participation developed by Arnstein (2019), who classifies participation into eight levels divided into three categories. The levels falling within the lowest category, 'non-participation', are defined as artificial, and seek to educate participants rather than enable participation in planning (Arnstein, 2019). 'Tokenism' permits participants to have a voice but does not guarantee participants the power to implement what has been said (Arnstein, 2019). Lastly, 'citizen power', the highest degree of participation, places participants equal to or higher than the original power-holders (Arnstein, 2019). It has been well established in adjacent fields that public participation is beneficial to decision-making and there are several arguments for placing the community in the role of decision-maker (Bohnet, 2015; Hammouri et al., 2015).

During adaptation planning, scholarship suggests municipalities should engage in extensive public participation with a broad range of stakeholders to strengthen efforts and achieve successful adaptation (Chu et al., 2015; Cloutier, 2015; Meerow & Woodruff, 2020; Rivas et al., 2021; Susskind & Kim, 2021;). The integration of technical expertise with civilian knowledge that results from public participation has been said to create superior solutions compared to those derived from a single source (Berke & Stevens, 2016). Public participation has even been identified as a plan quality principle in multiple evaluations of climate plans (Berke & Stevens, 2016; Guyadeen et al., 2019; Meerow & Woodruff, 2020). Furthermore, calls for public participation to address climate change go back decades, in fact, Article 6 of the 1992 UNFCCC clearly states the importance of public participation (UNFCCC, 1992, as cited in Few et al., 2007).

The inclusion of a broad range of stakeholders has proven beneficial for overcoming barriers to successful climate adaptation. For example, Camponeschi (2021) argues that the mainstream narrative surrounding adaptation focuses too greatly on ecological vulnerability, and that social and psychological determinants require greater attention. Too strong a focus on ecological factors creates several barriers in adaptation pertaining to the intersection of "climate change impacts and the urban environment", however, including a broad range of stakeholders at various stages of adaptation planning can help overcome these barriers (Cloutier, 2015, p. 470). Additionally, Lyles et al. (2018) identifies one of the most common barriers within municipal climate adaptation planning to be lack of information and communication. Incorporating multiple perspectives enhances the flow of information in both directions and contributes to a greater understanding of adaptation issues (Amaru & Chhetri, 2013; Baird et al., 2014; Cloutier et al., 2015). For instance, Feist et al. (2020) describes the WWF's implementation of a community climate change vulnerability assessment in Saint John River Valley in New Brunswick that has enabled the sharing of local knowledge and concerns, and enhanced understanding of local hazards.

Furthermore, scholars call for participation to be thoroughly embedded in adaptation processes at various stages (Webb et al., 2013; Chu et al., 2015; Cloutier et al., 2015). Involving "a diverse group of actors at various stages of the planning process" confronts local challenges of climate change, and develops "a shared understanding of risks, issues, and outcomes" which in turn increases the chances of successful adaptation (Cloutier et al., 2015, p. 460-461). More specifically, Ford (2015) argues that public participation should be included in risk assessments

and development of adaptation measures, stating that decision making is influenced by public opinion, and that public perspective encourages initiation and development of adaptation programs. Similarly, Amaru and Chhetri (2013) encourage "widespread participation, flexibility, and integration of multiple stakeholders" (p. 135). However, in order to engage with the social and psychological determinants as Camponeschi (2021) suggests, and to realize the benefits of participation, municipalities must move past tokenism (Ford, 2015). Rivas et al.'s (2021) comparative analyses of plans, where the authors seek to determine attributes that promote successful implementation of adaptation plans, the authors determine a participatory approach has proven to bring greater benefits when there are more opportunities to participate, and that involving stakeholders and citizens was the quality showing the strongest statistical significance (Rivas et al., 2021). Moreover, Chu et al. (2016) conclude that inclusive planning can lead to equitable outcomes.

Importance of Participation for a Place-Based Approach in Climate Adaptation

Because climate impacts are local and adaptive capacity varies across communities, adaptation is considered a local issue, and therefore careful consideration of context, or taking a place-based approach, is critical for adaptation planning (Amaru & Chhetri, 2013; Butler et al., 2015; Susskind & Kim, 2021). Globally, experts have demonstrated the significance behind considering specific political, geographical, and social context in climate action plan development (Mitchell & Laycock, 2019; Orderud & Naustdalslid, 2020; Bhardwaj, 2021). Nuanced understandings of local experiences and dynamics has been identified as crucial for development of robust adaptation plans, and there is consensus that the likelihood of plan success increases when the engaged parties are intimately connected to the issues (Woods, 2008; Amaru & Chhetri, 2013). Public participation is a way to obtain information pertaining to local populations and livelihoods, and directly apply it to adaptation measures, and enables citizens to have a voice in decision-making, thus ensuring adaptation plans encompass relevant actions (Bidwell & Schweizer, 2021; Sethamo & Harder, 2021).

Engaging with local perspectives provides nuanced understandings of local context and thus informs the development of locally appropriate solutions (Wesche & Armitage, 2013; Susskind & Kim, 2021). Public participation provides local knowledge and experiences an opportunity to be incorporated into adaptation measures and therefor aids the design of community-oriented measures (Wesche & Armitage, 2013). It has been widely argued that effective adaptation is "designed and modified according to local institutional strengths, civil society capacities, and urban climate adaptation needs" (Chu et al., 2013, p. 387). Extensive participation has been identified as a method for addressing local context and concerns (Chu et al., 2013). Moreover, ensuring local population's concerns are addressed is critical for successful climate change adaptation. Scholars emphasize that the well-being of local communities and individuals is imperative for building climate resilience (Burton & Mustelin, 2013; Camponeschi, 2021).

Importance of Representation in Climate Adaptation

Traditionally marginalized groups, defined as "low-income populations and ethnic and racial minorities" are amongst the most vulnerable to climate change impacts (Fiack et al., 2021,

p. 1). Marginalization occurs when processes are developed without paying consideration to the needs of disempowered groups, thus creating physical, cultural and socioeconomic inequalities (Fitzgibbons & Mitchell, 2019). The importance of including vulnerable populations in the planning process has been highlighted (Berke & Stevens, 2016).

Climate-related hazards exacerbate existing stressors in addition to creating new ones, and these groups tend to have less access to resources when preparing for or coping with climate hazards (Chu et al., 2015; Brink & Wamsler, 2018). Adaptation planning literature not only emphasizes "inclusive and place-based analyses" but the integration of diverse knowledge (Bennet et al., 2016, p. 917). However, adaptation planning often excludes disadvantaged groups (Regmi et al., 2016; Brink & Wamsler, 2018). In fact, poor levels of engagement can lead to gaps in "understanding the relationship between climate trends and adaptation outcomes at the local level" due to excluding important actors (Amaru & Chhetri, 2013, p. 129). Brink and Wamsler (2018) found that in Sweden interactions between the public and local government normally involve citizens with high levels of education, and often times those with legal knowledge, while those who are most vulnerable to climate related hazards were excluded. Similarly, Regmi et al., (2016) found that in Nepal, participation with adaptation planning primarily included powerful members of the community.

When scholars argue for involving a broad range of stakeholders, this includes marginalized and vulnerable populations (Few et al., 2007; Bohnet, 2015; Brink & Wamsler, 2015; Cloutier et al., 2015). Including marginalized groups throughout development, planning, and implementation provides a broader understanding of local context, and "lived experience with structural inequalities can provide unique insights and perspectives that can inform solutions (Roberts & Pelling, 2018; Fitzgibbons & Mitchell, 2019, p. 650). Furthermore, participation mechanisms that target marginalized groups enable underrepresented social groups to express needs and priorities, and mitigate structural inequalities (Fitzgibbons & Mitchell, 2019). Overall, inclusive adaptation planning leads to greater equity, and increased equity has been identified as a critical strategy for "fostering collaboration with citizens and support[ing] long term adaptation" (Chu et al., 2016; Brink et al., 2018, p. 82).

In addition to strengthening adaptation plans, inclusion with adaptation initiatives can offer an opportunity to improve the quality of life for these communities by increasing their resilience to climate change and mitigating their exposure to existing environmental harms that may be worsened by its effects (Fiack et al., 2021). Without inclusion of marginalized groups, local governments risk inadequate representation (Chu et al., 2016). Excluding these groups creates issues with equity and "can fortify structural inequalities and the institutional processes that create them" (Serrao-Neumann et al., 2015; Fitzgibbons & Mitchell, 2019, p. 648). Similarly, acting on climate change has the potential to "produce new forms of vulnerability and risk for marginal groups" (Bulkeley et al., 2013, p. 918).

Public Participation in Practice

Despite normative commitments to participation in climate adaptation, the translation of participation from theory to practice has been challenging (Mitchell & Laycock, 2019). In a recent review of Canadian municipal climate plans, participation was found to be the lowest

quality component of the plans (Guyadeen et al., 2019). In fact, only 40% of the assessed plans included public participation in plan development, and 35% discussed the objective of participation (Guyadeen et al., 2019). Mainly, municipalities engage with government departments and agencies, and do not recognize the public as stakeholders (Guyadeen et al., 2019). According to Guyadeen et al. (2019), most municipalities did not outline a rationale for inclusion of stakeholders, despite detailed accounts of stakeholder involvement being beneficial for plan creation (Berke et al, 2013). Furthermore, Glaas et al. (2022) found that participation in adaptation planning in the context of Norrköping, Sweden, occurred primarily in the late planning stages as opposed to consistently throughout.

The disconnect between scholarly literature and practice is not a recent occurrence within climate adaptation, and it was established long ago that climate change action plans require improved policies for participation (Tang, 2010; Mitchell & Laycock, 2019). Still, municipalities are critiqued for lacking opportunities for participation, and many participation efforts are found to be inadequate (Kiełkowska et al., 2018; Piggott-McKellar et al., 2019).

Gaps in Knowledge

In recent years, there has been extensive research on how adaptation measures can be tailored to a region's unique circumstances (Mitchell & Laycock, 2019; Orderlud & Naustdaslid, 2020; Philp and Cohen, 2020; Bhardwaj, 2021). There has also been a steady production of research pertaining to the merits of public participation and inclusivity within adaptation planning. However, the role of public participation in a place-based approach is under researched. Scholars emphasize a gap in understanding of municipal public participation practices and agree that despite widespread support for participation during various stages of adaptation, there are a few fundamental aspects of participation that remain under researched (Berke et al., 2013; Burton & Mustelin, 2013; Chu et al., 2016; Hügel & Davies, 2020). For example, calls for the inclusion of marginalized and vulnerable populations are plenty, however,

Transparency regarding who is involved and in what capacity has been identified as a contributor to plan quality, however, as Guyadeen et al. (2019) demonstrates, municipal plans lack transparency and do not explicitly outline how participation is embedded within adaptation planning (Berke et al., 2013). While the findings from Guyadeen et al. (2019) have been substantial contributions to both the plan quality and public participation literature, a more extensive evaluation of this element of plans is required, as little is known surrounding interactions between civil society and municipal government during climate adaptation (Chu et al., 2016).

Critical details of participation are under researched (Hügel & Davies, 2020). For instance, scholarly literature does not explicitly identify mechanisms for successful participation, and therefore how to achieve desired levels of participation remains unclear. (Burton & Mustelin, 2013; Bohnet, 2015; Uittenbroek et al., 2019). Similarly, Mees et al. (2018) claims further assessment of communicative tools is required to establish levels of efficacy, and Burton and Mustelin (2013) argue the evaluation of efficacy of public participation within plans requires greater attention.

Furthermore, increased insight into how municipalities are incorporating the so-called best practice of including a broad range of stakeholders is essential (Few et al., 2007; Chu et al., 2016). There is little indication that Canadian municipalities are actively recruiting diverse voices in order to sufficiently fulfill the need for accurate local context (Guyadeen et al., 2019). Therefore, fundamental questions pertaining to who is participating, when they are being included in the planning process, and how or in what capacity are being engaged and included need to be explored (Few et al., 2007; Burton & Mustelin, 2013; Chu et al., 2016).

Barriers to Public Participation

Barriers are defined as "obstacles that can stop, delay or divert adaptation process away from its intended objectives" (Piggott-McKellar et al., 2019, p. 376). Piggott-McKellar et al., (2019) outline a multitude of barriers related to communication and language, such as failing to link traditional and scientific knowledge, and poorly communicating projects and initiatives. Piggott-McKellar et al., (2019) also emphasizes that barriers related to inequity and power remain prominent within adaptation. Decision-making tends to fall into the hands of the elite, while marginalized groups are rarely involved (Regmi et al., 2016; Brink & Wamsler, 2018; Piggott-McKellar et al., 2019).

Serrao-Neumann et al. (2015) demonstrates the potential for inequality when vulnerable groups are excluded, and the authors identify the unwillingness of the government to grant the public greater influence as a principal barrier in participation. Within municipal government, parties possess conflicting rationale for participation concerning both why the public should be involved and what is the desired outcome (Bidwell & Schweizer, 2021). Some parties may see intrinsic value in involving the community (normative), while others view it as a mechanism for increased efficacy (instrumental) (Bidwell & Schweizer, 2021).

While incorporating a diverse group of voices may help to overcome these barriers, this task itself hosts difficulties. Contrasting interests, goals and values are unavoidable when engaging a broad range of stakeholders, and these differences may lead to conflict within participation processes (Cloutier et al., 2015; Bidwell & Schweizer, 2020). Also, a variety of perspectives can hinder knowledge-transfer and mutual understanding (Cloutier et al., 2015). Furthermore, should extensive participation be employed, there is concern over whether or not the public will actually engage. For example, in a government campaign encouraging residents to possess an emergency-package' in their homes, one study found a 10.8% participation rate among respondents (Hegger et al., 2017). For this reason, questions pertaining to which mechanisms of participation are being used, and who is being engaged with, need to be answered.

Methodology

Research Approach

This research employs a directed qualitative content analysis (QCA) to meet the research objective of evaluating public participation within Canadian municipal climate adaptation plans. According to Hsieh and Shannon (2005), "the goal of a directed approach to content analysis is

to validate or extend conceptually a theoretical framework or theory" (p. 1281). Qualitative content analyses have been applied successfully in previous studies related to climate change policy and planning (Baynham & Stevens, 2013**;** Pollock et al., 2018; Selseng et al., 2021). For instance, Pollock et al. (2018) use QCA to analyze transcripts of interviews conducted with community-based organizations regarding disaster preparedness and community resilience. Similarly, Selseng et al. (2021) employ a deductive QCA in the analysis of municipal survey data, with the intention of gaining insight into the development of the municipal adaptation process and progress.

Sample

For this study, climate adaptation plans are defined as climate plans that explicitly engage with climate adaptation. Plans that address mitigation were considered out of scope and therefore excluded. When municipalities develop mitigation plans, there is a focus on internal measures to reduce corporate emissions. Adaptation plans, on the other hand, are community oriented. Similarly, plans identified as "Corporate", as opposed to "Community" adaptation plans have been excluded due to the focus on internal measures.

Plans published in English by Canadian municipalities who are members of ICLEI were included in this study. ICLEI is an international non-governmental organization that supports climate adaptation planning, among other local government planning activities (ICLEI, n.d.). ICLEI is known as one of the most established and credible networks in municipal climate change adaptation planning, both globally and in Canada. Therefore, municipalities who are ICLEI members are expected to employ best practices in climate adaptation planning (Lesnikowski et al., 2020). Furthermore, only plans published by municipal governments for a singular town or city were included, and plans for regional, county, or districts were excluded.

Plans which met the inclusion/exclusion criteria were accessed and downloaded directly from municipal websites and formed the sampling frame for this study (Table 1).

Table 1. Inclusion and exclusion criteria for climate adaptation plan selection.

Inclusion	**Exclusion**
○ Climate plans and strategies published by Canadian local municipalities ○ Plans and strategies published by ICLEI members ○ Community plans and strategies ○ English ○ Focus is solely on climate change adaptation	○ Climate plans and strategies published by other community groups and administrative bodies (i.e., regional municipalities, provincial and federal government, NGO's) ○ Corporate climate plans and strategies ○ Plans and strategies published by Canadian municipalities that are not recognized ICLEI members ○ Non-English ○ Focus includes climate change mitigation

In total, there are 31 municipal members of ICLEI in Canada. Of the 31 members, 10 municipalities have existing climate adaptation plans. Of the 10 municipal adaptation plans published by ICLEI members, one is a regional municipality. This study will exclude the Waterloo Region due to its status as a regional municipality and exclude Saskatoon due to its status as a corporate plan. Therefore, this study will include the following 8 Canadian municipal adaptation plans (Table 2).

Table 2. Canadian municipal climate adaptation plans included in this study.

Municipality	**Plan**
1. Calgary	Climate Adaptation Plan for Calgary
2. Campbell River	Community Climate Adaptation Plan
3. Edmonton	Climate Resilient Edmonton: Adaptation Strategy and Action Plan
4. Essex	Climate Ready: A Climate Change Adaptation Plan for the Town of Essex, 2021-2026
5. Fredericton	Climate Change Adaptation Plan
6. Halton Hills	The Climate Change Adaptation Plan
7. Thunder Bay	Climate-Ready City: City of Thunder Bay Climate Adaptation Strategy
8. Vancouver	Climate Change Adaptation Strategy

ICLEI Milestones

Climate adaptation plans are created through a climate adaptation planning process, which generally involves planning, implementation, and monitoring. While many adaptation planning processes exist, this research recognizes ICLEI's 5 Milestones of Climate Adaptation methodology as reflective of the key phases in the climate adaptation process (Figure 1). Since this research will employ a directed content analysis of published climate adaptation plans, it will focus on the planning process (Milestone's 1-3) rather than adaptation implementation and monitoring. Information pertaining to Milestone's 4 (implement) and 5 (monitor/review) will not be available within plans and, therefore, will not be included in this study.

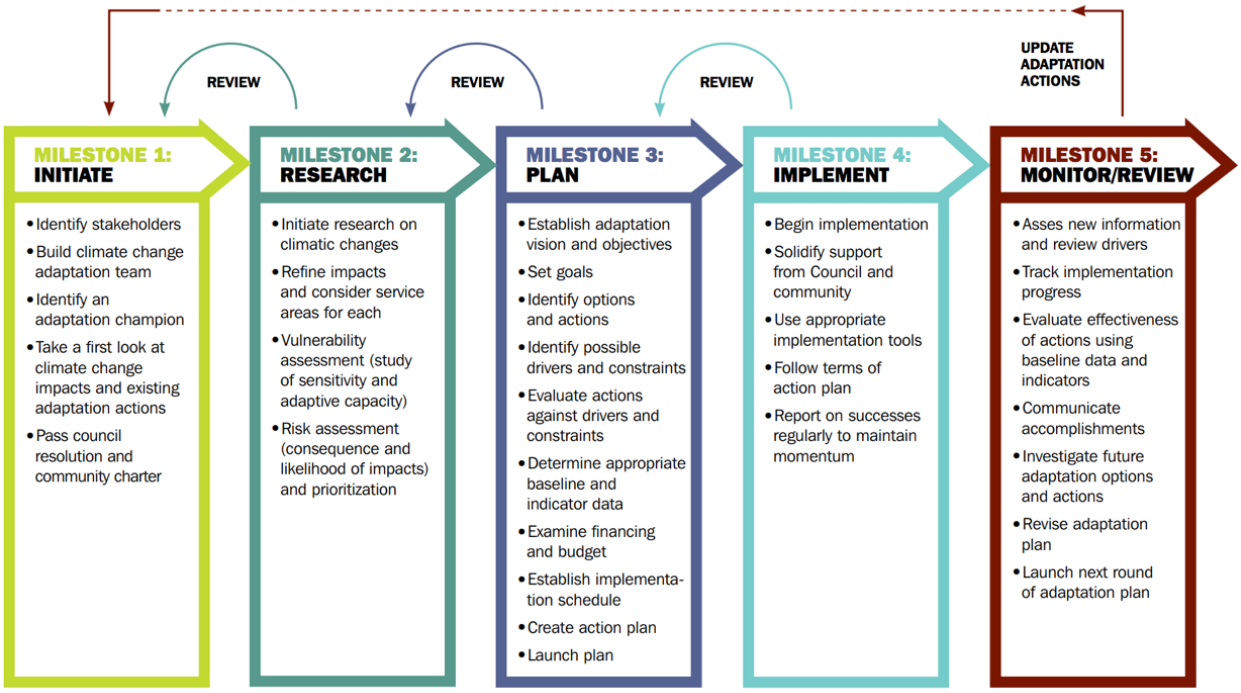

Figure 1. ICLEI Milestone Framework (ICLEI, n.d.).

Assessment Framework

To evaluate how principles of public participation are being operationalized in Canadian municipal climate adaptation plans, I have developed an assessment framework based on the conceptual framework developed by Uittenbroek et al. (2019). This framework emphasizes the who, when and how of participatory processes. In the Uittenbroek et al. (2019) framework, *who* refers to how the selected participants represent the public, this includes the distinction between complete representation of interests, defined as select stakeholders who represent the public, or full inclusion, which refers to participation from everybody. Additionally, it also considers an equal versus skewed representation of interests. *When* describes "the number of opportunities offered to influence the decision-making process" (Uittenbroek et al., p. 2019). Lastly, *how* includes which participation practices have been selected and if these practices allow participants to critically engage in discussion (Uittenbroek et al., 2019) A total of 6 questions have been allocated to the three categories (Table 3).

Table 3. Assessment framework (adapted from Uittenbroek et al. 2019).

Dimension	**Indicators**
1. Who: Interest Representation	○ Which participants or stakeholders' groups have been identified in the plan? ○ Is the focus on complete representation of interests or full inclusion?

2. When: Degree of Participation	○ During which stage(s) did participation occur? ○ Did participation occur before or after decision-making?
3. How: Degree of Influence	○ What mechanisms were used to attract participants? ○ What is the rationale for participation?

Analysis

I evaluated the plans through a two-step process. First, I conducted a quantitative scoring based on the assessment framework (Table 3). I calculated an index score for the 3 dimensions of public participation (Uittenbroek et al. 2019; Horney et al., 2017). Previous research on evaluating climate plans has followed a similar protocol (Baynham & Stevens, 2013; Guyadeen et al., 2019). Indicators in each category have been awarded a score from 0 to 2 (Appendix A), adapted from Baynham and Stevens (2013)

Each indicator has been considered against the criteria found in Appendix A and rated accordingly. The culminating dimension scores are a summation of these indicator ratings. The highest degree of public participation per dimension of participation are as follows: *Who: Interest Representation* = 4, *When: Degree of Participation* = 4, and *How: Degree of Deliberation* = 4. Therefore, the highest degree of public participation capable of being awarded under this scoring is 12.

Following the quantitative scoring, I conducted qualitative coding. The first step of the qualitative coding was to identify relevant text associated with each dimension of public participation (Assarroudi et al., 2018). The qualitative coding software NVivo has been used to assist in organizing and coding relevant text (Lawless et al., 2021).

Importance of Work

This research will fill a critical gap in climate adaptation literature and generate relevant knowledge for climate adaptation planning and practice. Through the evaluation of public participation in Canadian municipal climate plans, I aim to generate a greater understanding of how principles of participation are translating into practice. Moreover, the culminating work will provide valuable detail regarding whether municipalities are committed to employing participation. To translate the findings of this research to the broader academic community, I aim to produce one peer-reviewed publication that I will submit to the *Journal of Environmental Planning and Management*.

Results

Mean scores for participation across the eight adaptation plans ranged from 0 out of 6 to 5 out of 6, with an average score of 3 (Fig. 2). The municipality with the highest mean score is

Campbell River. Campbell River was also the only municipality to not receive a 0 in any indicator (on the 0-2 scale). Vancouver did not score above a zero in any category, and therefore received the lowest score (0 out of 6). While Essex scored a higher mean than Calgary, they received a 0 of out 2 in the 'How' dimension. The total scores disaggregated by municipality and indicator on the 0-12 scale can be found in Appendix B.

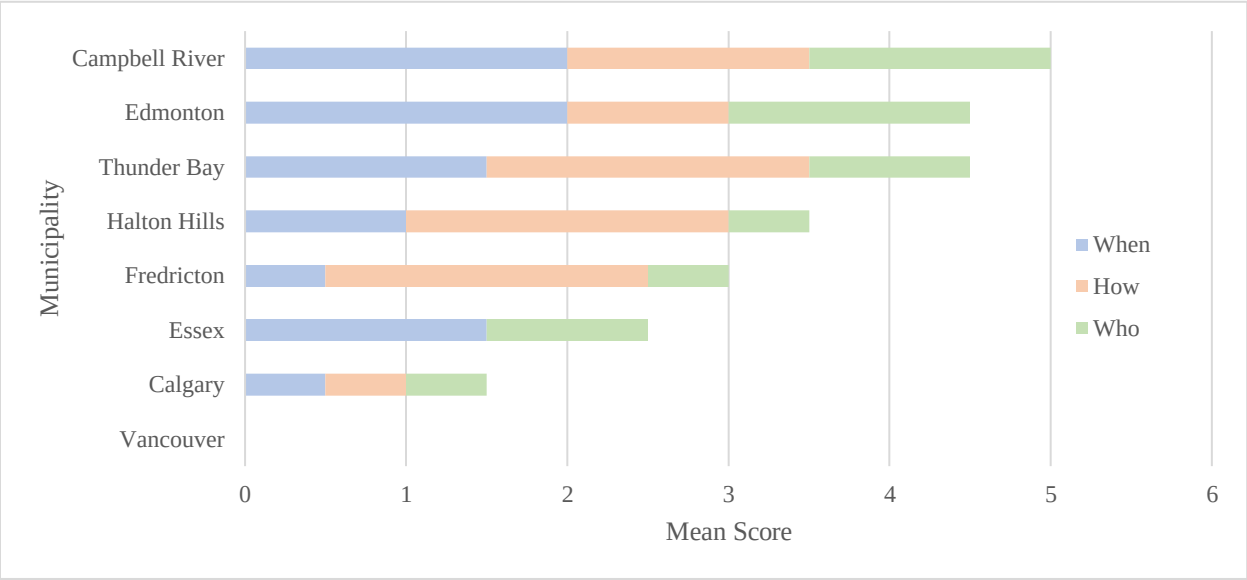

Figure 2. Average scores for participation in community climate adaptation plans in Canada (n=8). Participation was evaluated across three dimensions: who (green), when (blue), and how (orange). Note that the highest possible score is six.

Who: Interest Representation

The mean score for the 'Who' dimension across all eight plans was 0.81 out of 2, and the standard deviation was 0.75 (Fig. 3). Therefore, this dimension varied moderately across municipalities, and displays the least amount of variance across dimensions. In fact, 4 municipalities (50%) received a mean score of 0.50.

This dimension sought to explore two key indicators. First, whether community stakeholders have been engaged, and if so, are they clearly identified in the plan? Second, does the plan mention a wide range of stakeholders, and have these stakeholders been represented equally?

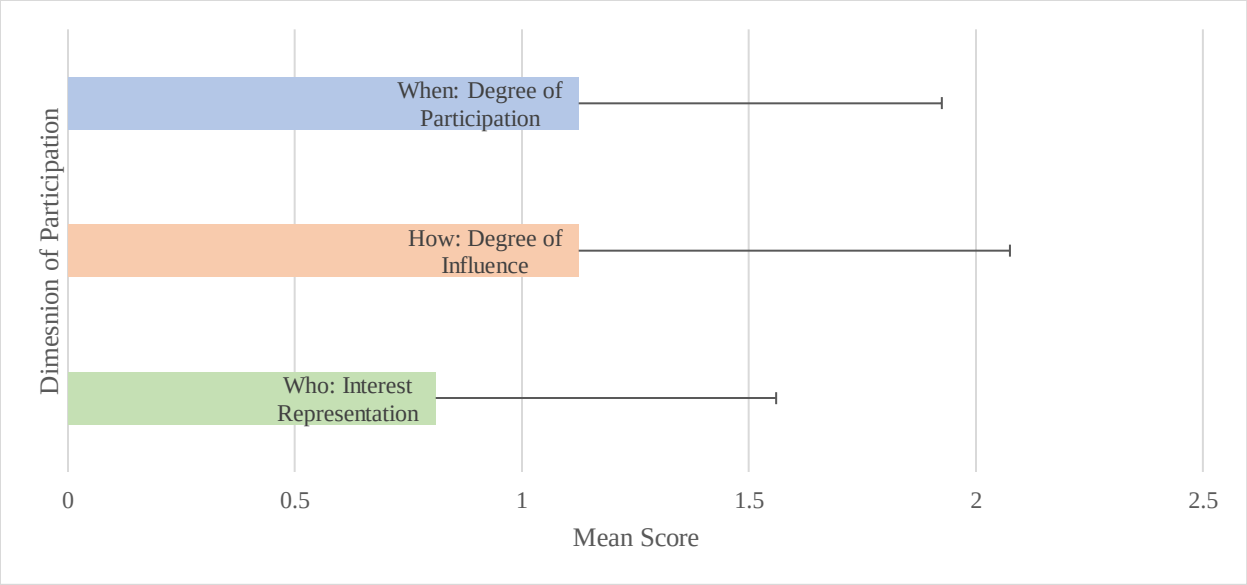

Figure 3. Average scores for the three dimensions of participation in community climate adaptation plans in Canada (n=8). Note that the highest possible score is two.

Which participants or stakeholders' groups have been identified in the plan?

The first indicator for 'Who' dimension received a mean score of 1.25 out of 2 (Fig. 4a). The standard deviation was 0.70, which suggests that variance across plans was moderate, but not substantial. With the exception of Vancouver, all plans were scored above 0.

The analysis found that while 7 out of 8 municipalities demonstrate that the community had been engaged, the specific community participant and stakeholder groups and individuals are not adequately identified in 4 (50%) plans. Instead, the government actors and consultancy groups are clearly listed. Campbell River, Edmonton and Essex possessed the three plans that sufficiently fulfilled this indicator and received a score of 2. The Town of Essex (2021, p. 6), for example, mentions the inclusion of the Essex Climate Adaptation team, which is comprised of individuals who "[represent] various stakeholder groups and the residents of the municipality as members of the ECAT - an ad-hoc committee of Council". The plan goes on to list the names of the 14 individuals on the ECAT. Alternatively, Campbell River (2020, p. 4) lists the stakeholder groups who participated in the plan's development, as opposed to the individuals:

> BC Ferries, BC Hydro, Campbell River Environment Committee, Campbell River & District Chamber of Commerce, Department of Fisheries and Oceans, Greenways Land Trust, Homalco First Nation, Island Health North Island College, School District 72, Strathcona Regional District, Vancouver Island University, We Wai Kai Nation.

Is the focus on complete representation of interests or full inclusion?

The second indicator received the lowest ranking amongst all six indicators across all three dimensions of participation (0.37 out of 2; Fig 4a). The standard deviation of 0.51 was also the lowest amongst the indicators. This is the result of municipalities only receiving a score of

either 0 or 1 (on the 0-2 scale). Of the eight plans, three (37%) mentioned a wide range of stakeholders. However, no plans were able to demonstrate that there was equal inclusion of these stakeholders.

The low score in tandem with findings from the qualitative analysis suggests that plans are generally not demonstrating that a broad range of stakeholders have participated, and there is a skewed representation of interests due to the overwhelming inclusion of government and professional stakeholders, and minimal identification of community stakeholders. When community participants are addressed, municipalities are failing to demonstrate how the selected community members accurately represent the voices of the community. Thunder Bay (2015), for example, received a score of 1 out of 2, because while the claim that approximately 170 participants were involved in plan development suggests a broad range of stakeholders have been included, whether or not there was an equal or skewed representation of interests cannot be determined with the given information. Moreover, one half of the stakeholder groups ("City council, city managers and staff" [p. 13]) all represent similar perspectives as they all constitute as Thunder Bay employees, while the second half of the groups ("service sector professionals, key community stakeholders, and EarthCare community partners" [p. 13]) are vague and undefined.

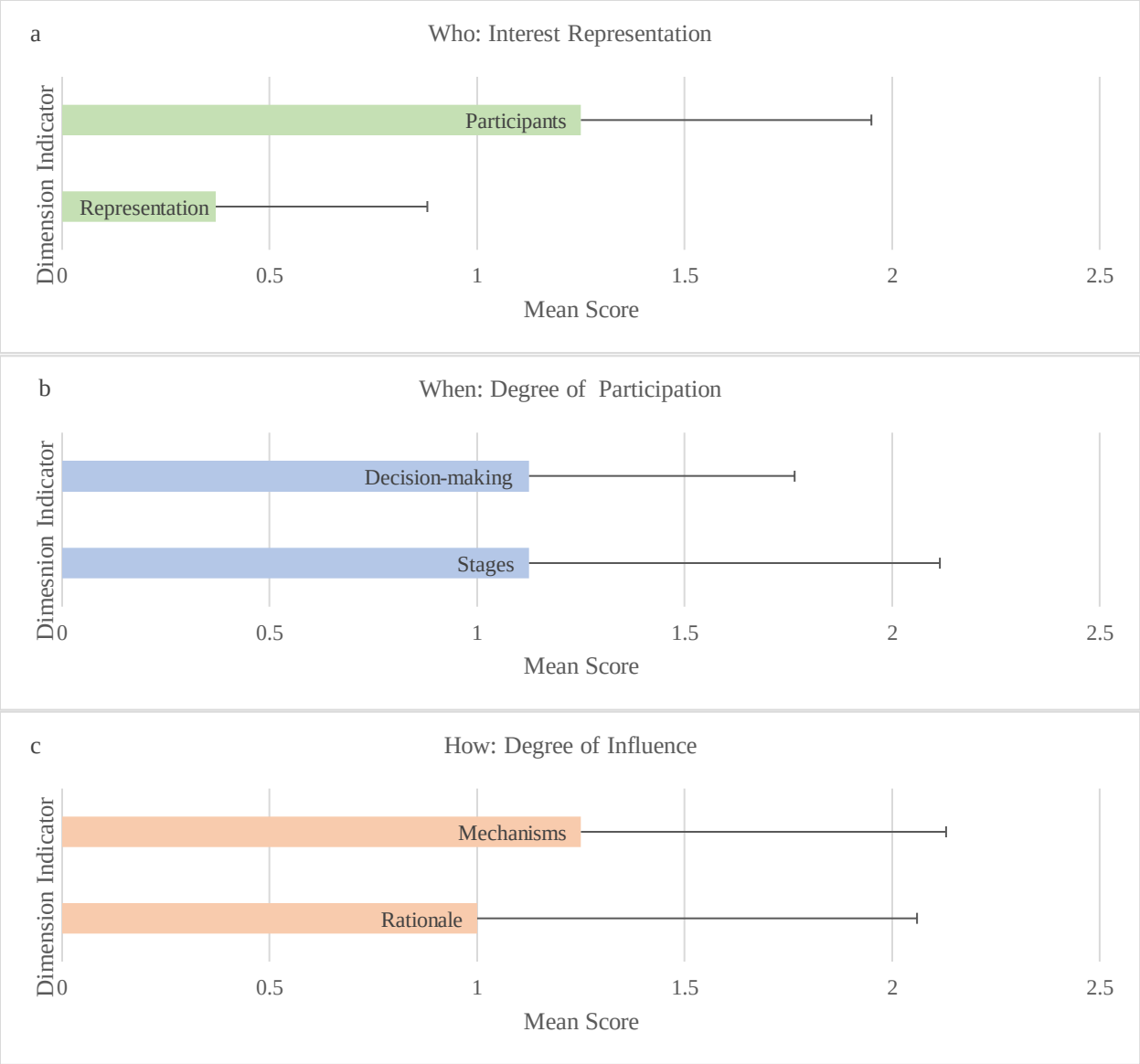

Figure 4. Mean indicator scores by dimension of public participation in community climate adaptation plans in Canada (n=8). The three dimensions of public participation are who (green), when (blue), and how (orange).

When: Degree of Participation

The 'When' dimension is concerned with whether municipal plans have demonstrated when in the planning process participation has taken place, and whether it has occurred prior to decision-making. This dimension received a mean score of 1.12 out of 2; Fig. 3). The dimension's standard deviation was 0.80, indicating that this dimension varied moderately across municipalities.

During which stage(s) did participation occur?

The mean score of this indicator was 1.12 out of 2, and the standard deviation was 0.99, suggesting that variance across municipalities was high (Fig. 4b).

The qualitative analysis uncovered that most plans provide one of two areas where participation can be discussed: an outline of the planning process disaggregated by stages, or a separate outreach section. For example, the Halton Hills (2020) municipal plan includes "Section 3.2: Public Engagement" (p. 13), which provides details on when engagement took place, i.e. "Two surveys were posted on Let's Talk Halton Hills to encourage input to the development of the Plan (Spring/Summer 2019 and December 2019" (p. 13). Halton Hills received a 1 out of 2 in this category because of the inclusion of this section, however, it did not receive a 2 because all of the mentioned participation opportunities occurred in 2019, which coincide with Milestone's 2 and 3, and there is no evidence that the community was engaged with during Milestone 1.

While 3 plans (37%) identified that participation occurred during Milestone's 1, 2 and 3 of the ICLEI Milestone framework, other plans mentioned participation occurred but were either less transparent about when it took place, or did not include it throughout the entire process. For example, Calgary (2022) claims that "extensive stakeholder engagement" (p. 53) was integral to plan development but does not provide adequate information to determine when participation occurred.

Did participation occur before decision-making?

The mean score of this indicator was also 1.12 out of 2 (Fig. 4b). The standard deviation for this indicator was 0.64, indicating that there was a moderate degree of variance across municipalities.

All plans except for Vancouver determined that some level of participation occurred prior to decision-making, while Edmonton and Campbell River demonstrated that participation occurred during decision-making as well and thereby received scores of 2 out of 2. For example, Edmonton (n.d.) disaggregates their plan development into the following three stages: investigation, direction setting and taking action. The 'direction setting phase' is when key decisions were being made, and "involved identifying pathways to a climate resilient Edmonton" (p. 9). During this phase, Edmonton (2018) sought "public input to further define a vision for a climate resilient Edmonton" (p. 10). Additionally, "city staff and key collaborators were consulted to develop the action plan and the strategy stakeholder group was engaged to evaluate identified actions" (Edmonton, 2018, p. 10).

Also, plans consistently mentioned that community participation would be employed extensively in the implementation stages of action items, and that this would be crucial for successful implementation.

How: Degree of Influence

The third dimension of participation sought to determine the frequency and variety of mechanisms for participation, and if the rationale for participation is addressed or evident in the plans. The mean score for the 'How' dimension was 1.12 out of 2, and the standard deviation was 0.95, indicating that the how dimension varied significantly across municipalities (Fig. 3).

What are the mechanisms for participation?

This indicator received a mean score of 1.25 out of 2 and a standard deviation of 0.88 (Fig. 4c). The analysis concluded that 3 plans (37%) include minimal mechanisms for participation, while an additional 3 plans (37%) include multiple and varied mechanisms. Two plans (Essex and Vancouver) provided insufficient detail and received scores of 0 out of 2.

Participation mechanisms mentioned in Thunder Bay's plan are 12 workshops and one reception event. The workshops took place over the course of 6 months and involved identifying climate impacts on various sectors including: "Environment & Sustainability; Lifestyle & Culture, Local Economy & Growth, Public Administration & Governance, Community Health & Safety; and Utility Services & Municipal Infrastructure" (Thunder Bay, 2015, p. 13). While there are not multiple different mechanisms mentioned, Thunder Bay has received a score of 2 out of 2, due to the abundance of opportunities to participate.

What is the rationale for participation?

This indicator received a mean score of 1 and a standard deviation of <1 (Fig. 4c). This indicates that scores varied drastically across municipalities. This is because 4 (50%) of plans received a 0 out of 2, and the other 4 (50%) received a 2 out of 2.

This analysis highlights that either a rationale for participation was not provided, or that plans adequately demonstrated that participation went beyond consultation and influenced decision-making. In the case of Vancouver, their plan received a 0 out of 2 due to failure to demonstrate that participation occurred. Fredericton, on the other hand, received a 2 after demonstrating that outcomes of public participation played a role in decision-making. The plan states:

> In a series of workshops, City staff identified 84 climate change impacts. Members of the public and other stakeholders identified an additional 76. This initial list of impacts was filtered by the Adaptation Committee for overlap, and then for impacts the City could address according to its mandate set out in the Local Governance Act. (Fredericton, n.d. p. 6).

In the best-case scenario, Halton Hills (2020) provided a "What We Heard" (p. 14) section, which summarizes key theme from public engagement.

Moreover, this indicator provided insight into rationale for participation. For example, Campbell River (2020) opted to engage with the project partners for two apparent reasons: 1) a wide range of stakeholders accounts for community needs; and 2) to implement the actions

outlined in the plan, external organizations are required, and the identified groups are essential for actualization.

Table 4. Coding frequency and example from municipal climate adaptation plans.

Dimension Indicator	Frequency	Example
Who: Interest Representation Which participants or stakeholders' groups have been identified in the plan? Is the focus on complete representation of interests or full inclusion?	69	*"The development of this strategy centred on workshops and engagement activities that leveraged expertise and local knowledge of City Council, City managers and staff, service sector professionals, key community stakeholders and EarthCare community partners."* (Thunder Bay)
When: Degree of Participation During which stage(s) did participation occur? Did participation occur before or after decision-making?	42	*"In November 2018, ICLEI Canada facilitated a workshop to capture how climate change will affect the built, natural, and social and economic systems based on local climate projections for the region."* (Campbell River)
How: Degree of Influence What are the mechanisms for participation? What is the rationale for participation?	52	*"Surveys: Two surveys were posted on Let's Talk Halton Hills to encourage input to the development of the Plan (Spring/Summer 2019 and December 2019)."* (Halton Hills)

Discussion

In this study, I conducted a directed content analysis of 8 municipal community climate adaptation plans to examine the dimensions of public participation in adaptation planning. The process has included qualitative coding and quantitative scoring. I evaluated the plans against the three dimensions of public participation defined in the Uittenbroek et al.'s (2019) conceptual framework: Who, When, and How. The dimensions as conceptualized by Uittenbroek et al. (2019) are as follows: 'Who' refers to how the selected participants represent the public, 'When' refers to the number of opportunities presented, and 'How' includes the selected mechanisms for participation and if these practices allow participants to critically engage in discussion.

My analysis revealed four key findings that are important for adaptation planning in Canada and beyond. First, I demonstrate that despite the strong case for public participation in

climate adaptation planning in the academic literature, a broad range of stakeholders are typically not being engaged in municipal adaptation planning. Second, I show that participation occurred before decision-making in the majority of plans, yet participation during all stages of the planning process only occurred in 50% of plans. Third, I find that plans were polarized in the way they reported using participation to inform the plans' development: half the plans clearly described how participation influenced decision-making in plan development and received 2 out of 2 for this indicator, while the other half were completely silent on this issue and received 0 out of 2. Lastly, I demonstrate that the number and range of mechanisms for participation is highly variable across plans. I discuss each of these key findings below.

The first key finding, which relates to the 'Who participates' dimension of public participation, highlights that a wide range of community stakeholders are not participating in adaptation planning. Consistent with Guyadeen et al. (2019), my research demonstrates that municipalities primarily engage with government departments, agencies, and consulting groups, and that there is a lack of transparency regarding who the community participants represent. While plans suggested or implied that the community had been engaged with, the specific groups were not clearly outlined. Moreover, since the stakeholders who were engaged were primarily government and professional groups, a wide range of participation by diverse community stakeholders has not been demonstrated. A lack of community participation is contradictory to academic literature's recommendations, which clearly argues that inclusion of diverse perspectives helps overcome barriers, and increases chances of successful adaptation (Camponeschi, 2021; Cloutier et al., 2015). This finding supports claims from Mitchell and Laycock (2019) and Tang (2010) that climate change adaptation theories are not translating into practice. This finding also aligns with studies conducted in Sweden and Nepal, where the authors concluded that interactions between the government and the public typically involved citizens with high levels of education and power within the community, thus excluding vulnerable populations (Brink & Wamsler, 2018; Regmi et al., 2016). Furthermore, by not engaging with a wide range of community voices and predominantly engaging with professionals and subject matter experts, plans do not guarantee that local contexts are adequately accounted for, which can lead to the development of climate policies "largely irrelevant to who they are supposed to benefit" (Berke & Stevens, 2016). Future research that explores why diverse community participants are not being engaged should be conducted. Such research has the potential to expose barriers to engagement and identify solutions. Additionally, in-depth exploration of municipal plan development may uncover the specific community stakeholders and if they truly represent the community.

The second key finding, which relates to the 'When' dimension of public participation, identifies that participation is occurring throughout Milestones 1 (Initiate), 2 (Research) and 3 (Plan) in 50% (4 out of 8) of plans. Therefore, half of the sampled plans align with best practices outlined in scholarly literature, which argues for participation at multiple stages in the planning process (Amaru & Chhetri, 2013; Webb et al., 2013; Chu et al., 2015; Cloutier et al., 2015; Ford, 2015). However, this same literature claims that participation should include a wide range of stakeholders, which, as per finding one, has not been demonstrated. Furthermore, including stakeholders in the decision-making process is proven to have a positive effect on "the transformative potential for adaptation" (Cattino & Recken, 2021 in Glaas et al., 2022), and while 7 out of 8 of the plans conduct participation prior to decision-making, only 2 have

demonstrated participation has been a part of the decision-making process. Also, consistent when Burton and Mustelin's (2013) findings, all plans in this sample emphasized the importance of participation within implementation. Moreover, this finding partially aligns with Berke et al. (2013)'s claims that municipal plans lack transparency despite transparency being identified as principle of good planning (Berke & Stevens, 2016). This finding provides insight into the fundamental question of when participation occurs, but also highlights that transparency regarding the planning process needs improvement and has not been widely adopted across Canadian municipalities.

The third key finding, which relates to the 'How' dimension of public participation, highlights that half the plans clearly articulated how participation influenced decision-making, while the other half had no information on this issue. When considered against Arnstein's ladder of participation, no plans indicated that community participants surpassed a tokenistic contribution and took on the role of decision-maker. Although, 50% of the plans exhibited that public voices were influential, and thereby that participation exceeded consultation and moved into the realm of placation. Meaning, while no municipality granted the community the capacity to "negotiate and engage in trade-off with traditional powerholders" community participants not only had a voice, but were in a position to advise (Arnstein, 2019, p. 25). The level of participation displayed in this study aligns with that of Arnstein's (2019) study of Model Cities, where "the level of citizen participation in the vast majority... is at the placation rung of the ladder or below" (p. 29). Participation outcomes influencing decision-making is consistent with Fiack et al. (2021), where "community feedback" (p. 8) was used by Virginia Beach and Detroit to justify certain decisions in plan development.

The fourth key finding, which also relates to the 'How' dimension of public participation, highlights an inconsistency in the number and variety of participation mechanisms employed by municipalities. It is widely recognized in the literature that galvanizing the public to participate is not easily done and receiving feedback only from certain groups hinders the ability to develop a plan that reflects the community (Berke & Stevens, 2016; Hallström et al., 2019). However, it has also been maintained that the planning process be inclusive, and doing so requires "actively notifying and mobilizing citizen groups to become engaged" (Berke & Stevens, 2016), and municipal government and planners in particular are well equipped to facilitate participation and collaboration (Maasakkers & Oh, 2020). The sampled municipal plans included mechanisms such as public meetings, workshops, surveys, and website forms. Variety and quantity within a single plan paled in comparison to plan development elsewhere. For example, in a study of social equity in adaptation plans, Fiack et al. (2021) found that in the development of their Climate Action and Adaptation Plan, Long Beach California "organized nearly 50 public outreach events, including community meetings, open houses, resource fairs, and expert panel discussions held at community gatherings throughout the city" (p. 6). Future research should evaluate how mechanisms of participation can be used to attract diverse participants and facilitate meaningful discussion.

These four key findings directly address the aforementioned gaps in knowledge regarding who is participating, when they are participating, and in what capacity. When considering finding two against finding one, it is important to acknowledge the barrier recognized by Wesselink et al. (2011), that "many practitioners refer to inclusion of representatives from other

government departments... as 'participation'". Moreover, this study further raises the question of "Which groups of stakeholders and which individuals as representatives of these groups should be consulted?" (Monno & Khakee, 2012).

Study Limitations

While this research has contributed to the understanding of public participation in the development of municipal climate adaptation plans in Canada, it has several limitations. First, this study was limited to examining 8 Canadian municipal plans according to the inclusion criteria outlined in Table 1. The criteria, while necessary for the scope of this research, inadvertently excluded municipalities from the following provinces and territories: Manitoba, Newfoundland and Labrador, Northwest Territories, Prince Edward Island, Quebec, Saskatchewan, and Yukon. The inclusion criteria were unintentionally partial to Alberta, British Columbia, and Ontario. Going forward, future research could productively explore the extent and nature of public participation in municipal climate plans from the provinces not included in this research.

Second, while the conceptual framework of dimensions of public participation (Uittenbroek et al., 2019) was carefully selected from literature, there are other frameworks that were not used in this study. Exploring public participation in Canadian municipal adaptation plans using other frameworks might yield different insights. In the future, comparing the results from various participation frameworks could be useful. Moreover, this study did not address the role of mandated vs. volunteer adaptation plan development.

Lastly, the scope of this research was limited to ICLEI Milestones 1, 2 and 3, which represent the planning and research phases of adaptation plans. Therefore, any public participation which occurs following a plan being published and is being integrated in local government's policies was not included in this research. Understanding the role of public participation in adaptation plan implementation represents a productive area for future projects.

Conclusion

Climate change is will continue impacting Canadian municipalities for hundreds of years, and therefore there is a need to implement effective and equitable climate adaptation strategies. Scholarly literature has clearly identified public participation as a key principle in adaptation planning at the municipal level for its ability to include diverse stakeholders and thus develop relevant, contextual, place-based strategies. Yet, there has been uncertainty regarding whether or not key principles are being adopted by practitioners.

This research contributes to the growing body of literature surrounding plan quality, public participation, and municipal adaptation planning. This study uncovers the reality of participation in a sample of Canadian municipalities, by answering questions surrounding who is participating, when they are participating, and in what capacity. This study adds to the literature that demonstrates that best practices related to public participation are not always translating to practice

This evaluation of adaptation plans revealed the following four key findings. First, that a broad range of stakeholders are not consistently being engaged in municipal adaptation planning, and if there is engagement, there is a skewed representation of interests with a bias toward government departments, agencies and professional consultants. Second, that while participation with community stakeholders is occurring prior to decision-making, participation is not occurring throughout all stages of the planning process. Third, there is some evidence that participation influences decision-making, but this is not consistently demonstrated within municipal plans. Lastly, the mechanisms for participation are highly variable across plans and overall, the mechanisms for supporting public participation in Canadian adaptation plans need improvement in order to attract diverse populations.

Ultimately, this research has demonstrated that municipalities are inconsistent in following best practices and lack transparency regarding key dimensions of community participation. By identifying discrepancies across Canadian municipal plans, the key findings of this study will hopefully aid in future plan development.

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Appendices

Appendix A: Scoring criteria.

		0	1	2
Who	*Which participants or stakeholders' groups have been identified in the plan?*	Community participants and stakeholders are not mentioned, or the community has not been engaged.	The community has been engaged, but the specific groups are not clear.	Community participants and stakeholders are clearly identified.
	Is the focus on complete representation of interests or full inclusion?	The plan does not mention of a wide range of stakeholders.	The plan mentions a wide range of community stakeholders.	The plan mentions equal inclusion of a wide range of stakeholders from multiple groups within the community.
When	*During which stage(s) did participation occur?*	The plan does not address when participation occurred, or participation does not occur during Milestones One, Two or Three.	Participation does not occur during the entire planning process.	Participation occurs during Milestone's One, Two and Three.
	Did participation occur before or after decision-making?	Participation did not occur before decision-making, or there is insufficient information, and this cannot be determined.	Participation occurred before decision-making.	Participation occurred before and during decision-making.
How	*What participation mechanisms are used?*	There are no mechanisms for attracting participants or conducting participation addressed in the plan.	Mechanisms for participation are addressed, but minimal.	Mechanisms for participation are abundant and varied.
	What is the rationale for participation?	No rationale is provided, there is insufficient detail, or no community participation occurred.	Community participation is consultation.	Participant input is at least placation and influences decision-making.

Appendix B: Index scoring results on the 0-2 scale.

	Campbell River	Essex	Halton Hills	Calgary	Edmonton	Fredericton	Vancouver	Thunder Bay
Who								
Which participants or stakeholders' groups have been identified in the plan?	2	2	1	1	2	1	0	1
Is the focus on complete representation of interests or full inclusion?	1	0	0	0	1	0	0	1
When								
During which stage(s) did participation occur?	2	2	1	0	2	0	0	2
Did participation occur before decision-making?	2	1	1	1	2	1	0	1
How								
What are the mechanisms for participation?	1	0	2	1	2	2	0	2
What is the rationale for participation?	2	0	2	0	0	2	0	2
Total Score	**10**	**5**	**7**	**3**	**9**	**6**	**0**	**9**