A Comparative Analysis of Watershed Stewardship, Flood Mitigation, Ecological Resilience, and Climate Resilience Initiatives by Community Land Trusts in Ontario

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ABSTRACT

Community Land Trusts (CLTs) have traditionally been recognized as mechanisms for securing permanently affordable housing. However, their potential contribution to environmental planning has received limited scholarly attention. This research examined how CLTs contribute to environmental planning in Ontario through a comparative case study of the Parkdale Neighborhood Land Trust (PNLT) and the Muskoka Community Land Trust (MCLT). Drawing upon ecosystem-based management (EBM), nature-based solutions (NbS), and sustainable adaptive planning frameworks, this research explored how Ontario CLTs contribute to watershed stewardship, flood mitigation, ecological resilience, and climate resilience. A comparative case study methodology was employed, incorporating document and policy analysis and the interpretation of publicly available environmental and spatial datasets to examine governance structures, planning initiatives, and environmental conditions surrounding each case study.

The findings demonstrate that although both CLTs were established primarily to address housing affordability, they have evolved to increasingly integrate environmental stewardship, climate adaptation, and long-term land management into their mandates and practices. While the PNLT emphasizes neighborhood-scale environmental initiatives such as green infrastructure, biodiversity enhancement, and climate resilience within a highly urbanized landscape, the MCLT adopts a broader approach that integrates sustainable development, watershed stewardship, and ecosystem conservation within Muskoka's ecologically significant environment. The comparative analysis further highlights the importance of place-based governance, demonstrating that environmental planning strategies in Ontario are shaped by the province’s unique geographical, ecological, institutional, and socio-political contexts. The study also includes a discussion of emerging Indigenous CLTs and protected areas (IPACs) to illustrate how Indigenous knowledge systems and stewardship principles expand contemporary approaches to environmental planning in Ontario.

This research contributes to the growing literature on community land governance by demonstrating that CLTs can function as function as scalable, community-based vehicles for watershed stewardship, flood mitigation, ecological resilience, and climate resilience. The findings provide practical insights for planners, municipalities, conservation authorities, and community organizations seeking to integrate affordable housing, environmental stewardship, and collaborative governance to support more resilient and sustainable communities.

FOREWORD

This Major Research Paper (MRP) is submitted in partial fulfilment of the requirements for the Master of Environmental Studies (MES) program to the Faculty of Environmental and Urban Change at York University, within the Environmental Planning specialization. This research represents the culmination of my graduate studies which integrates interdisciplinary coursework with applied research to address contemporary challenges in environmental planning. In this paper, I examined the role of community land trusts (CLTs) in Ontario in advancing environmentally sustainable and socially equitable planning practices. I explored how these community-led land governance models contributed to watershed stewardship, flood mitigation, ecological resilience, and climate resilience amid environmental, institutional, and socio-economic changes. This research aligned with the core objectives of the MES program by analyzing complex environmental issues through interdisciplinary methods. It highlighted the potential of CLTs as tools for integrating ecological stewardship with community-driven development, offering insights valuable for academic research and planning practice in environmental and urban contexts. Through this work, I have developed skills in critical analysis, research design, and the evaluation of governance frameworks, all of which are essential to professional planning practice. Ultimately, this MRP contributes to ongoing discussion in environmental planning by evaluating the potential of CLTs as tools for integrating ecological stewardship with community-driven development, offering insights relevant to both academic research and planning practice.

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Finally, I would like to thank my family and friends for their unwavering encouragement, patience, care, and support throughout this journey. I am reminded of a specific phrase in my language Urdu, khair or afiyat se karo, which translates to “be with good health, happy, and good faith” that has always been with me throughout this program. Thank you all, happy reading

1. Introduction

1.1 - Background and Context

The intersection of climate change, rapid urbanization, and ecological degradation is increasingly shaping environmental planning in Ontario, intensifying challenges related to the long-term sustainability of natural and built environments. These challenges require transitions toward stronger and more resilient environmental governance structures (Amorim-Maia et al., 2021, p. 2; Turner et al., 2022). Recent legislative and administrative shifts at the provincial level further complicate this instability. Specifically, the Ontario government's decision to consolidate the conservation authorities (Brown, 2025; Callan & D'Mello, 2026). This decision is part of a broader regulatory shift by the Ontario government that has continually weakened environmental regulations and legislation framed as "cutting red tape" (Crawley, 2024). These recent legislative and administrative shifts have raised critical questions about how environmental governance is organized and how responsibilities for land and water management are distributed amongst provincial, municipal, and community actors.

Watershed planning is one of the main mechanisms for implementing environmental governance in Ontario (Conservation Ontario, 2010). Watershed planning acknowledges the interconnections among land use, water resources, ecological processes, and human activities within natural drainage boundaries, rather than within political or administrative jurisdictions (Loucks & van Beek, 2017, p. 34-36). Watershed planning aims to coordinate decisions regarding water quantity, water quality, flood management, ecosystem protection, and sustainable development through integrated planning approaches (Loucks & van Beek, 2017, p. 34-36). Watersheds are ecologically and socially significant planning components because environmental changes in one area directly affect downstream hydrological processes, water quality, sediment transport, and ecosystem functions and thus communities throughout the watershed (Loucks & van Beek, 2017, p. 33–34). In Ontario, watershed planning has primarily been implemented as Integrated Watershed Management (IWM), which encourages collaboration among municipalities, conservation authorities, Indigenous communities, and local stakeholders to integrate environmental protection with long-term social and economic development (Conservation Ontario, 2010, pp. 5, 10–11; Loucks & van Beek, 2017, p. 36). Despite its wide application, watershed planning in Ontario now faces challenges due to legislative and administrative shifts, compounded by climate change, urbanization, and evolving responsibilities among provincial, municipal, and community organizations (Brown, 2025; Callan & D'Mello, 2026; Crawley, 2024; Loucks & van Beek, 2017, p. 40).

Within this shifting policy and legislative landscape, it is becoming increasingly evident that typical top-down approaches to environmental planning and governance may be insufficient in addressing complex and context-specific environmental challenges (Mikulewicz, 2019, p. 1811; Loucks & van Beek,

2017, p. 34). In response, academics and professionals have emphasized the importance of integrated and adaptive approaches to environmental management (Andrews, 2008; Kaplan-Hallam & Bennett, 2017; Loucks & van Beek, 2017, p. 36). Building on watershed planning, ecosystem-based management (EBM), nature-based solutions (NbS), and adaptive planning have emerged as complementary frameworks for addressing increasingly complex environmental challenges. EBM is defined as the integrated management of land, water, and living resources to promote conservation and sustainable use (McAfee & Malouin, 2008, p. 7). EBM acknowledges the intrinsic relationship between ecosystems and the people living within them. EBM has emerged as a central framework in Canadian environmental governance, management, and planning (McAfee & Malouin, 2008, p. 7). Similarly, nature-based solutions (NbS) have gained prominence as strategies that promote ecological processes to mitigate flooding, enhance biodiversity, and strengthen urban climate resilience (Vogel et al., 2022; Zoghi et al., 2025). EBM and NbS frameworks highlight the importance and urgency of planning approaches that are grounded in ecological principles and social inclusivity. EBM and NbS frameworks emphasize the role of communities in shaping environmental outcomes (Zoghi et al., 2025, p. 12).

Simultaneously, there is a growing shift in focus towards participatory and community-based models of governance (Loucks & van Beek, 2017, p. 40; Vogel et al., 2022). Meaningful stakeholder engagement is essential for achieving sustainable and equitable environmental outcomes. Meaningful stakeholder engagement enables local knowledge, values, and priorities to inform decision-making processes (Zoghi et al., 2025, p. 14). In Canada, community-based initiatives, ranging from watershed stewardship programs to citizen science efforts, have demonstrated the potential of localized knowledge and governance to influence environmental planning and policy (Macaraig, 2014; Vogel et al., 2022). However, key concerns remain on the uneven and underdeveloped integration of community-led governance models into planning and policy systems (Calder & Beckie, 2012, p. 149; Yet et al., 2022, p. 206). Academics and professionals have also emphasized the importance of traditional ecological knowledge (TEK) and Indigenous-led approaches to stewardship within environmental governance frameworks. Concepts such as two-eyed seeing seek to integrate Indigenous and Western knowledge systems, providing alternative approaches to environmental governance that emphasize relational understandings of land, water, and ecosystems (Zurba et al., 2019). These approaches highlight the importance of long-term stewardship, localized knowledge, environmental decision-making, and governance.

Community land trusts (CLTs) represent one such specialized governance model with the potential to bridge the gap between localized knowledge, governance, and environmental planning and policy. CLTs typically serve as nonprofit, community-based organizations that advocate for and support affordable housing, equitable land tenure, and stewardship by acquiring and holding land for long-term

community benefit (Davis, 2010, p. 4). By separating land ownership from market pressures, CLTs create opportunities for sustained community control over land use and development, ensuring homeownership stability even during unstable economic periods (Davis, 2010, p. 28; Thaden, 2011). While the role of CLTs in housing has been widely studied, emerging research suggests that these organizations may also (have the potential to) contribute to broader environmental planning objectives, including land stewardship, conservation, and climate resilience (Bunce & Aslam, 2016).

In Canada, CLTs have developed within a diverse range of geographic and governance contexts, in which the model has been layered into pre-existing housing institutions (Spicer & Trana, 2025, p. 2). Canadian CLTs, in general, rely on government finance and volunteer labour, favoring zero-equity co-operatives and rental tenures over wealth-building ownership forms (Spicer & Trana, 2025, p. 15). Canadian urban CLTs have typically emerged in response to gentrification and redevelopment pressures, making use of public transfers and public-social partnerships to acquire units and preserve affordability (Spicer & Trana, 2025, p. 14). In contrast, Canadian peri-urban or exurban CLTs operate within regions characterized by environmental sensitivity, seasonal economies, and increasing development pressures on natural landscapes (Kargwal et al., 2025). Meanwhile, Indigenous-led land trusts and Indigenous Protected Conservation Areas (IPACs) in Canada represent distinct governance models grounded in TEK systems, stewardship practices, and land relations. Indigenous-led land trusts are a relatively new branch of Canadian CLTs that offer alternative approaches to environmental planning and resource management (Zurba et al., 2019; Zhang et al., 2023). These varied forms of Canadian CLTs highlight the importance of economic, environmental, and geographic contexts in shaping how community land management operates and intersects with environmental planning and policy systems.

1.2 - Problem Statement

Despite the growing research on the potential of Canadian CLTs as important vehicles for environmental stewardship and climate adaptation, a significant governance gap persists in Ontario's planning landscape. Recent legislative and regulatory shifts, alongside the Ontario government's decision to consolidate the province’s conservation authorities, have signaled a shift toward centralized, development-oriented governance and land management strategies (Crawley, 2024). These new governance and land management strategies threaten pre-existing approaches by weakening local authorities' influence and creating institutional barriers to community-led initiatives (Morris & Stavinga, 2026). While scholars and practitioners argue that EBM and NbS promote decentralized, inclusive, and place-based governance, Ontario’s current trajectory risks further marginalizing the local knowledge and participatory models necessary for environmental stewardship and climate resilience (McAfee & Malouin, 2008; Turner et al., 2022; Amorim-Maia et al., 2021; Morris & Stavinga, 2026).

Ontario CLTs remain largely focused on the affordable housing sector, mitigating market pressures, and ensuring tenure security (Spicer & Trana, 2025). Although the permanent decommodification of land provides a robust legal foundation for long-term ecological stewardship, there is a lack of established policy pathways for CLTs to interact with municipal environmental planning systems (Bunce & Aslam, 2016; Calder & Beckie, 2012). This lack of integration is particularly evident in peri-urban and Indigenous contexts, where the regulatory environment often fails to recognize alternative land-relation models, such as Indigenous-led conservation, as legitimate governance frameworks (Zurba et al., 2019; Zhang et al., 2023). Ontario CLTs risk overlooking critical mechanisms for environmental governance and planning without a clear understanding of EBM, NbS, and adaptive management frameworks. There is an urgent need to investigate how CLTs can move beyond their traditional mandates to address the "missing voices" in environmental governance and provide a unified response to ecological and climate emergencies (Yet et al., 2022; Santoro et al., 2024). This research addresses the critical need for a framework that integrates EBM, NbS, and adaptive management principles with community-led land governance into Ontario's broader environmental planning and water management systems.

1.3 - Research Objectives

Within the Master of Environmental Studies (MES) program, this research examines how Ontario CLTs can use EBM, NbS, and adaptive management frameworks to inform water-related environmental planning, specifically in watershed management, stormwater mitigation, flood risk reduction, and climate resilience. While Canadian CLTs have historically been used to promote equitable land tenure, affordable housing, and community stability, this research investigates how CLTs can serve as vehicles for community-driven water management and ecological restoration, effectively bridging social equity and environmental sustainability (Turner et al., 2022). To address these research objectives, this study conducts a comparative analysis of two CLT typologies in Ontario to evaluate how they can integrate EBM, NbS, and adaptive management frameworks into their organizational and planning practices for watershed management, flood mitigation, and climate resilience. This research will also assess the extent to which municipal and provincial planning frameworks support or constrain Ontario CLTs' participation in environmental and watershed governance. The analysis is framed by principles of EBM, NbS, and adaptive management, emphasizing community participation and the co-production of knowledge as vital pathways for regional resilience (Nelson & Reed, 2025). The comparative analysis will be complemented by a discussion of a newly emerging third CLT typology in Ontario: Indigenous CLTs and Indigenous Protected and Conserved Areas (IPACs). The purpose of this discussion is to examine how this newly emerging CLT typology differs from urban and peri-urban CLTs and what lessons they can offer for CLTs across Ontario. By conducting a comparative analysis of CLTs across Ontario's diverse urban and

peri-urban contexts, as well as a discussion of newly emerging Indigenous contexts, this study explores how varied forms of governance shape environmental and water management as both natural and cultural resources, essential to ecological health and community well-being.

The importance of this research is framed through the context of the Ontario government's recent decision to consolidate the province's conservation authorities (Brown, 2025). This shift toward centralized management has major implications for Ontario CLTs, which often rely on collaborative relationships with conservation authorities, academic institutions, and local environmental initiatives (Morris & Stavinga, 2026). Understanding how these legislative and policy changes impact Ontario CLTs will provide important insight into the evolving relationship between local governance and provincial environmental policy (Hodge et al., 2020). Addressing this topic is ultimately vital for both environmental planning practice and policy in Ontario. Urban, rural, and Indigenous communities across Ontario face increasing pressures from environmental degradation, fragmentation, and the gradual repealing of critical environmental legislation and frameworks (Coristine et al., 2018). CLTs offer a unique model of community empowerment that aligns land ownership, ecological restoration, and climate adaptation within a shared-governance framework (Calder & Beckie, 2012). Integrating Ontario CLTs into the province's broader environmental planning processes can potentially enhance local capacity for water stewardship, particularly in underserved or marginalized communities (Loucks & van Beek, 2017, p. 36-37; Macaraig, 2014). Furthermore, Indigenous-led land trusts and protected areas introduce alternative governance models grounded in TEK and two-eyed seeing. These alternative approaches offer valuable lessons for inclusive and place-based environmental management (Zurba et al., 2019).

1.4 - Research Questions

This research is guided by the overarching question: Do CLTs in Ontario contribute to community-based water governance and environmental planning, and how can they effectively incorporate EBM, NbS, and adaptive management frameworks? This research analyzes how collective land ownership and multi-stakeholder governance can translate into effective water-management outcomes across Ontario's diverse CLT landscape. This research asks whether the same public-social partnerships that have allowed for the evolution of Canadian CLTs through "welfare partnerships" and institutional layering translating the model onto pre-existing social-housing institutions (Spicer and Trana, 2025), extends into environmental stewardship. Specifically, this research examines how Ontario CLT's governance structures and external partnerships enable or constrain participation in watershed stewardship, stormwater management, flood mitigation, and climate resilience; how EBM and NbS are integrated into land stewardship practices; and how geographical and ecological factors shape environmental planning priorities across urban, peri-urban/exurban, and Indigenous contexts.

This research also includes a discussion on how Indigenous-led protected areas (IPACs) and CLTs incorporate TEK and two-eyed seeing into water governance, and what distinguishes them from their non-Indigenous counterparts, highlighting the community and knowledge-integration dimensions of the analysis. Taken together, these questions move from internal governance to on-the-ground ecological practice, outward to shifting policy and regulatory contexts. This ultimately produces a structured comparative assessment of how Ontario CLTs can function as scalable, community-based vehicles for water planning and management, ecological resilience, and climate resilience.

1.5 - Significance of the Research

This research is significant because it brings together two bodies of work: CLTs and environmental planning. In the existing literature, Ontario CLTs are primarily discussed in the context of affordable housing and equitable land tenure (Davis, 2010, p. 4). However, this research examines their potential to serve as community-based vehicles in watershed stewardship, flood mitigation, ecological resilience, and climate resilience by adopting EBM, NbS, and adaptive planning frameworks. This research, therefore, contributes to the environmental planning landscape by demonstrating how land governance can support both social equity and environmental resilience, rather than treating those goals as separate policy domains (Loucks & van Beek, 2017, p. 392-393). This research is also timely in the context of recent policy and regulatory shifts at the provincial level, specifically the Conservative government's decision to restructure and consolidate Ontario's conservation authorities (Brown, 2025; Callan & D'Mello, 2026). This decision has altered the institutional context for local environmental governance and has thus created constraints on community-led stewardship (Brown, 2025; Morris & Stavinga, 2026).

By comparing urban, peri-urban/exurban, and Indigenous-led CLTs, this study examines whether different governance models produce distinct environmental planning outcomes and whether Indigenous stewardship frameworks offer distinct lessons for water governance and planning. This research has practical significance for municipalities, planners, and community organizations seeking more inclusive and resilient models of environmental governance. This research also helps to fill a gap in the existing literature on how Ontario CLTs operate beyond affordable housing and equitable land tenure into broader land and water planning and stewardship.

2. Literature Review

2.1 - Introduction and Historic Development of Community Land Trusts

CLTs are non-profit community-based landholding organizations that separate land ownership from individual housing ownership in order to secure long-term affordability, community control, and equitable land tenure (Davis, 2010, p. 4). In the classical model, the CLT retains ownership of the land while providing long-term, renewable ground leases to residents, coupled with membership-based or

multi-stakeholder governance to ensure that decisions about land use reflect collective community interests rather than market speculation (Davis, 2010, p. 4). This structure is central to the CLT model's purpose. By removing land from speculative markets, CLTs keep housing and land costs more stable over time and preserve the social value of land for present and future residents.

> "What the CLT does better than any other organization - its specialized niche in a densely populated nonprofit environment - is to preserve affordability when economic times are good and protect its homes and homeowners when times are bad." (Davis, 2010, p. 28).

CLTs also embody a broader philosophy of "land as a common good" (Davis, 2010, p. 4),

Drawing on earlier urban planning movements (arising in the United States, England, India, and Palestine) such as the Garden City movement and (agrarian) land reform initiatives emphasized collective ownership and stewardship (Davis, 2010, p. 9). These historical influences highlight that CLTs are part of a long lineage of efforts to redefine property relations and promote equitable access to land. The modern CLT model emerged in the United States during the civil rights era as part of a broader struggle for community control, racial justice, and the decommodification of land. Davis (2010) describes the model as arising in the late 1960s in the Southern United States, with early growth occurring first in rural settings and later in urban neighborhoods as cities began to face displacement, disinvestment, and gentrification pressures (p. 26-27). Bunce and Aslam (2016) similarly note that CLTs became especially relevant in Canadian cities due to rising land prices, affordability pressures, and widening socio-spatial disparities (p. 28-29). Through this lens, CLTs serve as housing institutions and land stewardship mechanisms, designed to protect land for community benefit, support more democratic control over urban spaces, and to resist urban and development encroachment over peri-urban spaces (Bunce & Aslam, 2016, p. 28).

The evolution of CLTs in Canada reflects broader political and economic changes, in particular the restructuring of social housing systems and the withdrawal of federal government support, beginning in the 1990s (Bunce & Barndt, 2020). Early Canadian CLTs emerged in Toronto, Vancouver, and Montreal, in response to affordable housing shortages, and were often initiated by cooperative housing organizations, non-profit developers, and community activists (Bunce & Barndt, 2020, p. 93-94). These early "first-generation" CLTs focused primarily on land acquisition for affordable housing, operating within the context of limited policy support and relying on partnerships with existing housing programs (Bunce & Barndt, 2020, p. 94). Since the early 2010s, a "second generation" of CLTs has emerged in Canada, driven by the intensifying housing crisis, gentrification, and renewed interest in community-led development models. These newer CLTs are more networked, more visible, and increasingly engaged with broader social and environmental objectives (Bunce & Barndt, 2020, p. 104-105). This shift reflects

a growing recognition of CLTs as multifunctional institutions capable of addressing complex urban and rural challenges, including land stewardship, community resilience, and equitable development.

In Canada, CLTs have developed through a different institutional trajectory than in the United States. Canadian CLTs have expanded through public-social "welfare partnerships" with governments and third-sector housing providers, and rely more heavily on government finance, volunteer labour, and non-profit models such as zero-equity co-operatives and rental housing (Spicer & Trana, 2025, p. 2). Rather than converging towards a more market-driven model, Canadian CLTs have been layered onto pre-existing social-housing institutions. This helps explain why Canadian CLTs often maintain stronger public policy frameworks and place less emphasis on private asset accumulation (Spicer & Trana, 2025, p. 2, 17-18). Together, these developments highlight the adaptability of CLT models across different contexts in Canada.

In both the United States and Canada, CLTs have evolved in response to specific social, economic, and political conditions, while maintaining core principles of community control, long-term affordability, and land stewardship. This is especially visible in Ontario, where CLTs have emerged in urban (Toronto), rural (Muskoka), and Indigenous (Temiskaming) contexts, as well as other regions, where affordability, governance, and land stewardship intersect with broader planning and environmental challenges (Bunce & Aslam, 2016). This creates an environment where CLTs and other community-based organizations can utilize "transformative approaches" and principles to address context-specific issues that form with the intersection of affordability, governance, land stewardship, planning, and environmental challenges.

2.2 - Community Land Trusts in Ontario

CLTs have been an integral, though often under-recognized, component of Ontario's planning landscape for several decades. One of the first formal CLTs established in Ontario was the Toronto Islands Residential Community Trust Corporation, established in 1993, with its legal authority established by the *Toronto Islands Residential Community Stewardship Act, 1993*. The establishment of the Trust and the subsequent Act came after decades of political struggle between the island residents and the Metro Toronto Council (MTC) (Prittie, 2002). The struggle was over the MTC's goal to demolish the island residents' homes following lease expirations and relocate them to make way for planned recreational development along the Toronto waterfront (Prittie, 2002). This conflict reflects a broader pattern in the development of Canadian CLTs, in which community land governance emerged in response to displacement pressures and contested planning priorities (Davis, 2010, p. 26-27). Historical accounts highlight long-standing tensions between the Toronto Islands' residents and government authorities over land use and tenure. The island communities date back to centuries-old settlements and have experienced repeated threats of displacement as the MTC attempted to reframe the islands as parkland and recreational

space (Prittie, 2002). These tensions intensified post-WW2, culminating in prolonged legal and political battles over the residents' rights to remain on the islands. The creation of the Trust and the subsequent Act in 1993 marked the "end of the debate over the future of the Toronto Island residential community" (Prittie, 2002).

The *Toronto Islands Residential Community Stewardship Act, 1993*, recognized the unique social and spatial nature of the island community and aimed to formalize a governance structure in which land would be collectively held while residents retained leasehold interests in their homes (Toronto Islands Residential Community Trust Corporation, n/d). Under this framework, the residential lands on Ward's Island and Algonquin Island were placed under the stewardship of the Trust and is leased to residents through long-term agreements of up to 99 years, reflecting the classic CLT model and principle of separating land ownership from housing ownership, helping to maintain long-term affordability and community stability (Toronto Islands Residential Community Trust Corporation, n/d; Davis, 2010, p. 4). The legislation also embedded key principles such as limiting speculative gains, ensuring permanent residency, and preventing "economic eviction", whereby rising costs could displace long-term residents (Prittie, 2002). The Toronto Islands Residential Community Trust Corporation remains active to this day, managing land tenure and housing for the Toronto Islands residential community. It demonstrates how CLTs can emerge from localized struggles over land, governance, and development, particularly in contexts where external pressures and state-led planning priorities conflict with existing communities. At the same time, the Corporation's institutionalization through provincial legislation highlights a defining feature of the Canadian CLT context: the integration of CLTs within formal governance and policy frameworks. It reflects a hybrid model in which community activism and state intervention converge to produce legally recognized land governance structures.

Since the establishment of the Toronto Islands Residential Community Trust Corporation, the number and diversity of CLTs in Ontario have expanded significantly. Today, there are around twenty-five CLTs in Ontario, the most of any province or territory in Canada. These CLTs span a wide geographic range, from urban centers in Toronto, Hamilton, and Ottawa to peri-urban and rural regions including Muskoka and Owen Sound, and to Indigenous communities in the Temiskaming District. This geographic diversity reflects the adaptability of the CLT model to different planning contexts, including areas facing urban intensification, housing affordability, seasonal economies, and environmental changes. The growth of CLTs in Ontario mirrors broader national trends identified in the literature. As Bunce and Barndt (2020) note, early Canadian CLTs were primarily concentrated in urban areas and were developed through partnerships with cooperative housing organizations and nonprofit developers (p. 94). These early initiatives were often constrained by limited policy support and funding but nonetheless established the foundation for subsequent CLT development. More recent "second-generation" CLTs have emerged in

response to intensifying housing crises, rising land values, and growing concerns about displacement and gentrification, particularly in major urban areas (Bunce & Barndt, 2020, p. 94, 101). In Ontario, this is evident in neighborhood-based CLTs, which focus on preserving affordable housing and protecting community spaces in rapidly changing urban environments. Emerging Indigenous CLTs operate through Indigenous governance models grounded in Indigenous knowledge and traditional ways of knowing regarding their relationship to land and water (Government of Canada, 2022)

At the same time, the expansion of CLTs in Ontario reflects a shift in how land trust practices are understood within the Canadian context. Historically, land trusts in Canada had focused primarily on protecting or preserving rural and wilderness areas, emphasizing conservation and ecological preservation (Bunce & Aslam, 2016, p. 24-25). However, increasing urbanization and rising land values have prompted a reconsideration of urban and rural lands as a site of stewardship. CLTs play a critical role in this transition by enabling community-based control over urban and rural lands and linking affordability to broader goals related to sustainability, equity, and environmental and water planning. Institutionally, the development of CLTs in Ontario also reflects the influence of Canada's broader housing and welfare systems. The process of "institutional layering" of Canadian CLTs has resulted in a CLT sector that is more closely connected to public policy, reliant on government funding and partnerships, and oriented toward non-market housing models (Spicer and Trana, 2025). In Ontario, this is evident in the ways CLTs often collaborate with municipalities, non-profit housing providers, and community organizations to acquire land, secure funding, and implement projects (Bunce & Aslam, 2016; Spicer and Trana, 2025). The Canadian Network of Community Land Trusts (CNCLT) plays a central role in supporting this growing sector. As a national umbrella organization, the CNCLT facilitates knowledge-sharing, capacity building, and advocacy among Canadian CLTs (Canadian Network of Community Land Trusts, 2025). The CNCLT helps to standardize definitions and practices, and supports the development of new CLTs. In Ontario, the CNCLT has assisted in connecting local initiatives to broader provincial and national CLT movements (Canadian Network of Community Land Trusts, 2025). Overall, CLTs represent an increasingly important component of Ontario's planning landscape; they offer alternative approaches to land use and governance that integrate social and environmental objectives.

2.3 - Environmental Planning and Management Frameworks

Environmental planning and management approaches in Canada have increasingly shifted towards integrated, ecosystem- and systems-based approaches that recognize the interdependence of ecological, social, and economic systems (McAfee & Malounin, 2008, p. 8). Traditional top-down planning models, which often separated environmental protection from development, have proven insufficient in addressing complex challenges such as climate change, biodiversity loss, and watershed degradation (Harris, 2008, p. 14; Loucks & van Beek, 2017, p. 34). In response, a range of frameworks

have emerged to guide more holistic and resilient approaches to land and resource management. These frameworks emphasize integration across spatial and temporal scales, collaboration among stakeholders, and the need to account for uncertainty and complexity in environmental decision-making (McAfee & Malounin, 2008, p. 8; Loucks & van Beek, 2017, p. 43). This research is grounded in an interdisciplinary environmental planning framework that integrates ecosystem-based management (EBM), nature-based solutions (NbS), and sustainable adaptive planning. Together, these frameworks provide a foundation for examining how CLTs can contribute to water and environmental planning, watershed management, and climate resilience in Ontario. This study positions these approaches as complementary lenses that collectively emphasize systems thinking, long-term stewardship, and participatory governance (Loucks & van Beek, 2017, p. 571-572). Through this integration, CLTs are conceptualized as potential mechanisms for bridging community-based land stewardship with environmental planning systems.

2.3.1 - Ecosystem-based Management (EBM)

EBM provides one of the central theoretical foundations for this research. EBM is defined as "a strategy for the integrated management of land, water, and living resources that promotes conservation and sustainable use in an equitable way" (McAfee & Malouin, 2008, p. 7). This framework emphasizes the interconnectedness of ecological, social, and economic systems, promoting a holistic, place-based approach to environmental planning (Loucks & van Beek, 2017, p. 568). Rather than focusing on individual resources or sectors, EBM prioritizes maintaining ecosystem structure, function, and resilience across spatial and temporal scales (McAfee & Malounin, 2008, p. 8). In the Canadian context, EBM has been widely adopted as a guiding framework for environmental governance and resource management. It is embedded in national and provincial policies, including biodiversity strategies and watershed planning initiatives, and has been operationalized through integrated planning approaches such as watershed-based management (Hendrickson, 2008, p. 19; Stewart & Neily, 2008, p. 75; Loucks & van Beek, 2017, p. 36). In Ontario, conservation authorities have played a central role in implementing EBM principles, particularly through flood mitigation, habitat restoration, and water resource management strategies (Conservation Ontario, 2010; Mitchell et al., 2014). These strategies demonstrate how EBM is translated into practice through coordinated governance structures integrating environmental, economic and social objectives.

However, despite its conceptual strengths, the implementation of EBM often faces significant challenges. Persistent gaps have been identified between the framework's high-level principles and its application at the local scale (Stewart & Neily, 2008), driven by fragmented governance structures (Mitchell et al., 2014, p. 463), limited coordination (Mitchell et al., 2014, p. 471; Loucks & van Beek, 2017, p. 60), and insufficient data (Harris, 2008). These barriers highlight the difficulty of operationalizing integrated approaches within complex institutional environments. In this context,

community-based governance models such as CLTs offer a potential pathway for localizing EBM principles (Bunce & Aslam, 2016, p. 28). By embedding environmental stewardship within community-controlled land governance, CLTs may function as decentralized, place-based systems that support ecosystem-based planning. While CLTs have traditionally been associated with prioritizing housing affordability and land access, they have also incorporated elements of land stewardship and conservation in their mandates (Bunce & Aslam, 2016). As Bunce and Aslam (2016) state, Canadian land trusts have historically focused on rural, agricultural, and wilderness conservation. However, emerging urban CLTs are also increasingly engaging with ecological sustainability and environmental management (p. 24). This evolution suggests that CLTs can act as hybrid institutions, combining environmental objectives with urban development and community governance. In this sense, CLTs can be understood as localized expressions of EBM, capable of integrating ecological management with equitable land governance at the community scale.

2.3.2 - Nature-based Solutions (NbS)

NbS provide a complementary framework to EBM, particularly in addressing climate-related challenges as well as urban and rural environmental pressures. NbS are a combination of actions that "can protect, sustainably use, manage, and restore natural or modified ecosystems, while addressing societal challenges effectively and adaptively, providing both human well-being and biodiversity co-benefits" (Vogel et al., 2022, p. 2). This framework emphasizes working with natural processes to achieve environmental outcomes, rather than relying solely on engineered or "grey" infrastructure (Zoghi et al., 2025, p. 12; Loucks & van Beek, 2017, p. 10). In environmental planning, NbS have gained increasing attention for their role in climate adaptation, flood mitigation, and biodiversity conservation. In Canadian urban contexts, NbS include practices such as green roofs/walls (Raymond et al., 2017, p. 21), permeable pavements (Zoghi et al., 2025, p. 9), bioretention systems (Zoghi et al., 2025, p. 6-7), and wetland restoration (Vogel et al., 2022, p. 3), all of which aim to mimic or assist natural ecosystem process including hydrological processes (Zoghi et al., 2025, p. 6), stormwater management (Zoghi et al., 2025, p. 3), controlled burnings (Nelson & Reed, 2025, p. 4), etc. These approaches can enhance (among other benefits) flood resilience, reduce surface runoff, and improve water quality, making them particularly relevant to watershed-based planning and urban sustainability (Zoghi et al., 2025; Loucks & van Beek, 2017, p. 490-502).

Despite their potential, the implementation of NbS across Canada and Ontario also remains uneven. According to the literature, many municipalities are still in the early stages of adoption (Zoghi et al., 2025, p. 12), with projects often limited to pilot initiatives and long-term monitoring and evaluation (Zoghi et al., 2025, p. 14). Barriers include limited technical guidance (Zoghi et al., 2025, p. 11), challenges related to cold climate conditions (Zoghi et al., 2025, p. 6-7, 9), and difficulties integrating

NbS with existing infrastructure systems (Zoghi et al., 2025, p. 12). These limitations highlight the need for governance models that can support the long-term implementation and maintenance of NbS. At the same time, NbS have been subject to critical scrutiny, particularly from Indigenous scholars (Nelson & Reed, 2025). While NbS are often framed as innovative approaches, Indigenous communities have long practiced forms of land stewardship, management, and biodiversity conservation that are rooted in Indigenous Knowledge Systems (IKS) and Traditional Ecological Knowledge (TEK) (Nelson & Reed, 2025, p. 1-2). One of the main critiques of NbS is that they are "embedded within an economic system that prioritizes growth and progress" (Nelson & Reed, 2025, p. 1), a consequence of which is that they avoid key discussions of decarbonization, i.e., moving away from fossil fuel solutions (Vogel et al., 2022, p. 2). Thus, the successful implementation of NbS requires an economic system that prioritizes "relational values focused on human and ecological well-being" (Nelson & Reed, 2025, p. 3).

However, there are concerns that decarbonization and other climate change initiatives implemented for NbS frameworks may further marginalize Indigenous communities by imposing Western conceptualizations of nature and management, thus "leading to an accelerated colonization of Indigenous lands and waters" (Vogel et al., 2022, p. 6). Instead, scholars and practitioners emphasize learning from Indigenous worldviews about relational and place-based understandings of ecosystems, in which social, cultural, and ecological systems are inseparable (Nelson & Reed, 2025, p. 3; Vogel et al., 2022, p. 6). Indigenous-led NbS initiatives in Canada demonstrate how these approaches can integrate IKS and TEK with scientific knowledge, contributing to climate resilience and biodiversity conservation. These initiatives highlight the importance of inclusive, participatory governance and capacity-building for implementing NbS (Vogel et al., 2022, p. 7; Loucks & van Beek, 2017, p. 36). Within this context, CLTs represent a potential community-based pathway for deploying NbS. The governance structures of CLTs create opportunities for long-term investment in environmental initiatives, allowing communities to prioritize ecological stewardship alongside housing and societal objectives, and helping bridge the gap between NbS theory and practice by embedding ecological objectives within community-led governance (Loucks & van Beek, 2017, p. 42-43).

2.3.3 - Sustainable Adaptive Planning

Sustainable adaptive planning frameworks extend EBM and NbS principles by emphasizing long-term resilience, flexibility, and iterative decision-making (Loucks & van Beek, 2017, p. 40). Sustainability requires balancing environmental, social, and economic objectives over extended time periods, recognizing that environmental systems operate across temporal scales that often exceed conventional management and planning cycles (McAfee & Malouin, 2008, p. 7; Loucks & van Beek, 2017, p. 40).

> "Ecological governance is a set of policies and institutions that achieves sustainability: the long-term survival of our civilization and our biosphere. Ecological governance implies close coordination of environmental policies on a global scale." (Antweiler, 2014, p. 378)

This necessitates management and planning approaches that are future-oriented and can address uncertainty (Loucks & van Beek, 2017, p. 42-43). Adaptive management is central to this approach. Defined as a structured, iterative decision-making process that incorporates monitoring, learning, and adjustment over time (Kaplan-Hallam & Bennet, 2017, p. 306-307; Holling et al., 1978, p. 137; Loucks & van Beek, 2017, p. 34). Kaplan-Hallam and Bennett (2017) describe adaptive management as a cyclical process with stages of learning, planning, implementation, and evaluation, enabling continuous refinement of strategies in response to changing conditions (p. 307). Similarly, Loucks and van Beek (2017) describe the process of creating "rolling" resource management plans that can be continually updated in response to new information, challenges, and hurdles that arise from complex natural systems (p. 40). These approaches are particularly important in environmental planning, where uncertainty related to climate change, ecological dynamics, and socio-economic conditions are significant.

In Ontario, adaptive and sustainable planning principles are reflected in integrated water resource management (IWRM) practices, serving as a practical application of ecosystem-based and adaptive approaches (Loucks & van Beek, 2017, p. 36). IWRM involves managing human activities and natural resources at the watershed scale, integrating environmental, economic, and social considerations into planning processes (Mitchell et al., 2014, p. 460-461; Loucks & van Beek, 2017, p. 34). This approach emphasizes collaboration among stakeholders, long-term monitoring, and the use of adaptive strategies to respond to changing environmental conditions (Mitchell et al., 2014, p. 467-468; Loucks & van Beek, 2017, p. 34). Creating a shared understanding of sustainability is an important first step in effective planning practices. Calder and Beckie (2012) emphasize that this requires collaborative learning processes in which stakeholders actively participate in dialogue, allowing diverse perspectives to inform decision- making (p. 148). While dialogue does not guarantee democratic outcomes, it enables more inclusive and productive planning approaches. Ultimately, authentic collaboration involves relationship- and capacity-building, shared problem-solving, and consensus-based decisions, with responsibilities distributed among participants (Calder & Beckie, 2012, p. 148; Loucks & van Beek, 2017, p. 567).

Despite its strengths, the implementation of adaptive planning frameworks faces similar challenges to those encountered in EBM and NbS frameworks, including institutional fragmentation, limited capacity, and funding constraints (Andrews, 2008, p. 27; Calder & Beckie, 2012, p. 151; Loucks & van Beek, 2017, p. 43-45). Although decentralization and education can enhance community ownership and capacity, achieving sustained engagement and collective action remains a persistent challenge in participatory planning practices (Calder & Beckie, 2012, p. 148; Loucks & van Beek, 2017,

p. 43-45). These barriers highlight the importance of governance models that are flexible, locally grounded and capable of responding to change (Andrews, 2008, p. 28; Loucks & van Beek, 2017, p. 43-45). CLTs inherently exhibit characteristics of adaptive governance. Their community-based decision-making structures support iterative learning, responsiveness to local conditions and the ability to adapt to changing policy and environmental contexts (Bunce & Barndt, 2020, p. 98). By embedding flexibility and community engagement within their governance models, CLTs can contribute to more adaptive and resilient planning systems. This makes them particularly relevant for addressing complex environmental challenges such as climate change, watershed degradation, and urban and rural sustainability.

2.4 - Literature Gaps

Despite a growing body of literature on EBM, NbS, sustainable, and adaptive planning frameworks, several important gaps persist at their intersection with CLTs. While EBM is widely recognized as a comprehensive framework for integrating ecological, social, and economic systems, its implementation often remains constrained by fragmented governance structures, limited coordination, and insufficient background data (Mitchell et al, 2014, p. 463, 471; Harris, 2008; Stewart & Neily, 2008). Similarly, although IWRM and watershed-based planning frameworks provide strong conceptual foundations, their application at the local scale continues to face institutional and capacity-related challenges (Mitchell et al., 2014, p. 460–461; Andrews, 2008, p. 27; Loucks & van Beek, 2017, p. 36). Research on NbS further highlights uneven implementation across Canada, with initiatives often limited to pilot projects and lacking long-term monitoring and evaluation (Zoghi et al., 2025, p. 12, 14). Additionally, critiques of NbS emphasize the risks of top-down implementation and the marginalization of Indigenous knowledge systems, particularly where Western frameworks dominate the environmental planning process (Nelson & Reed, 2025, p. 1-3; Vogel et al., 2022, p. 6). While adaptive planning frameworks emphasize collaboration, flexibility, and iterative decision-making, achieving sustained stakeholder engagement and meaningful participation remains a persistent challenge (Calder & Beckie, 2012, p. 148; Andrews, 2008, p. 28; Loucks & van Beek, 2017, p. 43-45).

Within this broader literature, the role of CLTs remains largely underexplored. Existing research has mainly focused on CLTs as tools for housing affordability and equitable land tenure, with limited attention to their capacity for environmental planning and land stewardship (Davis, 2010; Bunce & Aslam, 2016, p. 24–28). Although emerging Canadian CLTs are increasingly engaging with sustainability and community development goals, there is a lack of empirical research examining how CLTs can operationalize EBM, NbS, and adaptive planning principles within environmental and watershed planning contexts (Bunce & Barndt, 2020, p. 104–105). This research addresses these gaps by examining CLTs in Ontario as community-based governance models that integrate environmental planning frameworks with participatory land stewardship. By focusing on water-related planning, watershed management, and

climate resilience, this study contributes to a more interdisciplinary understanding of how CLTs can support sustainable and adaptive environmental planning in Ontario.

3. Methodology

3.1 - Research Design and Approach

This research was grounded in a comparative case-study methodology that examined how CLTs in Ontario contributed to environmental planning, with a specific focus on water governance, watershed management, and climate resilience within a rapidly evolving regulatory and institutional context. This study investigated how CLTs operationalized principles of EBM, NbS, and adaptive sustainable planning through their governance structures, partnerships, and land stewardship practices. By integrating document and policy analysis this research assessed how CLTs advanced environmental sustainability and resilience within their respective ecological and regulatory contexts. The comparative case-study approach was particularly well-suited for this research, as it enabled an in-depth analysis of complex, context- dependent governance systems while identifying cross-case patterns and divergences (Hodge et al., 2020).

Data collection drew on multiple sources to capture both the institutional and environmental dimensions of CLT activity. Organizational documents, including CLT-produced reports and studies, land stewardship plans, and project descriptions, provided insight into how these organizations articulated and implemented environmental and water planning objectives. Municipal planning documents established the policy context within which CLTs operate and enabled evaluation of their alignment with local environmental governance systems. Provincial frameworks, including the *Provincial Planning Statement, 2024, Conservation Authorities Act, 1990, Lakes and Rivers Improvement Act, 1990,* and the *Ontario Water Resources Act, 1990,* were also examined to contextualize the regulatory context guiding land and water management in Ontario. Academic literature, including those discussed in the Literature Review section, further supported the analysis by providing theoretical grounding in community governance, environmental and water planning, and EBM, NbS, and adaptive sustainable planning frameworks (Bunce & Aslam, 2016; Davis, 2010; DeFilippis et al., 2018; Turner et al., 2022).

The analytical framework for this study was grounded in comparative analysis, which facilitated the examination of how institutional and ecological contexts shaped community land governance outcomes. Spicer and Trana (2025) highlighted that Canadian CLTs have evolved through a process of "institutional layering" and welfare-oriented partnerships, demonstrating how comparative approaches can reveal subtle but significant governance differences. Similarly, Santoro et al. (2024) emphasized that comparative land governance analysis can identify relationships between institutional design, ecological performance, and planning outcomes. Building on these insights, this research applied a comparative

framework to assess how CLTs in Ontario engaged with EBM, NbS, and adaptive sustainable planning across diverse geographical and governance contexts.

Data analysis proceeded in three stages. First, a within-case analysis was conducted to develop a detailed profile of each of the selected CLTs, including governance structures, geographical context, environmental objectives, partnerships, and ecological characteristics. Second, a cross-case comparison was conducted using analytical matrices to identify similarities and differences across cases in governance approaches, geographical conditions, and environmental strategies. Finally, findings were synthesized through EBM, NbS, and adaptive sustainable planning frameworks to evaluate the capacity of CLTs to collectively contribute to broader environmental and water planning objectives in Ontario. This interpretive synthesis also considered how recent legislative and institutional changes at the provincial level, particularly the consolidation of conservation authorities, may have influenced opportunities for collaboration and community participation in environmental governance. Overall, this research design provided a structured and interdisciplinary approach to analyzing CLTs as community-based planning tools. This study contributed to a deeper understanding of how community land governance can support adaptive, ecosystem-based, and participatory environmental and water planning in Ontario.

3.2 - Comparative Case Study Method

This research employed a comparative case study method (Yin, 2019) to analyze how different institutional, geographical, ecological, and governance contexts shape the role of CLTs in environmental planning with respect to water planning and management. The case study approach was widely used in planning research to examine complex, real-world phenomena within their specific contexts, particularly where social, ecological, and institutional dynamics were deeply interconnected (Hodge et al., 2020). A comparative framework strengthened this approach by enabling the identification of patterns, divergences, and context-specific outcomes across multiple cases. Comparative case study research was particularly valuable for studying CLTs because of the diversity of governance structures and institutional arrangements within the model. As demonstrated by Spicer et al. (2022), CLTs are not uniform entities but instead represent a range of organizational forms, including variations in ownership, governance, and relationships with the state. Their analyses of publicly owned and community-based land trust models highlighted how differences in institutional design can influence outcomes related to community control, affordability, and long-term sustainability. This variability highlighted the importance of comparative analysis in identifying how governance structures shape planning and environmental outcomes.

This study selected two cases that vary across urban and peri-urban or exurban contexts in Ontario to examine how different geographical, environmental, and institutional conditions influence the implementation of EBM, NbS, and sustainable adaptive planning principles. By analyzing cases with distinct characteristics, this research explored how similar planning objectives are pursued under different

conditions and how contextual factors shaped governance approaches and environmental outcomes. These analyses incorporated both within-case and cross-case perspectives. Within-case analysis focused on the internal dynamics of each CLT, including governance structures, environmental priorities, and partnerships. Cross-case comparison then identified broader patterns, similarities, and differences, across cases, allowing for a more comprehensive understanding of how CLTs function as environmental planning tools.

3.3 - Case Selection Criteria and Selected Cases

The CNCLT is a national umbrella organization that supports CLTs across Canada (Canadian Network of Community Land Trusts, 2025). For this research two different types of CLTs in Ontario were selected from the CNCLT database: one urban and one peri-urban/exurbian (Canadian Network of Community Land Trusts, 2025). The reason the distinction was made between urban, peri-urban/exurbian was to examine how land and water governance varied across planning contexts in Ontario. These categories represent distinct ecological conditions, institutional arrangements, and power structures that shape community-based water planning. Urban CLTs operate within dense, infrastructure-focused environments, where stormwater management, flooding, and heat vulnerability are addressed through municipal planning and conservation authorities (Sustainability Solutions Group, 2025). Peri-urban CLTs operate at the urban-rural interface, where the fragmentation of watersheds, groundwater protection, and greenfield development require regional coordination (Kargwal et al., 2025).

Comparison and discussion of these two main types of CLTs enabled an assessment of how governance and geographical context as well as authority influenced the capacity of community-based institutions to shape water-related environmental planning outcomes. The comparative analysis of the two main CLT typologies was complemented by a discussion of a newly emerging third CLT typology in Ontario: Indigenous CLTs and Indigenous Protected and Conserved Areas (IPACs). The purpose of this discussion was to examine how this newly emerging CLT typology differed from urban and peri-urban CLTs and what lessons they offered for CLTs across Ontario. As previously mentioned, Indigenous CLTs operated through Indigenous governance models grounded in TEK and traditional ways of knowing regarding their relationship to land and water (Government of Canada, 2022). Below is a table outlining all the major CLTs in Ontario from the CNCLT website, based on their location and whether they are an urban, peri-urban/exurbian, or Indigenous. (Canadian Network of Community Land Trusts, 2025).

Table 1

Classification of Community Land Trusts in Ontario by Geographic Context (Urban, Peri-Urban/Exurban, and Indigenous) based on data from the Canadian Network of Community Land Trusts (CNCLT). (Canadian Network of Community Land Trusts, 2025).

Community Land Trust	Location of CLT	Type of CLT
Toronto Islands Residential Community Trust Corporation	Toronto	Urban
Parkdale Neighborhood Land Trust	Toronto	Urban
Kensington Market Community Land Trust	Toronto	Urban
Circle Community Land Trust	Toronto	Urban
Toronto Chinatown Land Trust	Toronto	Urban
Davenport Perth Community Ministry/Gete-onigaming Community Land Trust	Toronto	Urban/Indigenous
Community & Cultural Spaces Trust	Toronto	Urban
Eglinton Vaughan Community Land Trust	Vaughan	Urban
Little Jamaica Community Land Trust	Vaughan	Urban
South Etobicoke Community Land Trust	Toronto	Urban
Junction Village Community Land Trust	Guelph	Urban
Hamilton Community Land Trust	Hamilton	Urban
Community Land Trust of Niagara	Niagara	Urban
Stratford Affordable Housing Alliance	Stratford	Urban
Opportunity Villages Community Land Trust	Chatham	Urban
Kingston Community Land Trust	Kingston	Urban
Ottawa Community Land Trust	Ottawa	Urban
Community Living Ajax-Pickering and Whitby	Ajax	Urban
Orillia Community Land Trust	Orillia	Urban
Open Gates Community Land Trust	Southgate	Peri-urban/exurbian
Hastings Prince Edward Land Trust	Prince Edward	Peri-urban/exurbian
North Hastings Community Trust	Hastings County	Peri-urban/exurbian
Muskoka Community Land Trust	Muskoka	Peri-urban/exurbian
Glassworks Cooperative Village	Owen Sound	Peri-urban/exurbian

Temiskaming District Community Land Trust	Temiskaming Shores	Indigenous

Two CLTs were selected based on governance type, ecological and watershed context, degree of engagement with land or water stewardship, visibility in public discourse, and availability of public data, with the aim of maximizing variability across the cases. Candidate CLTs were examined based on whether they had represented in public-facing media, this involved searches across Google and major social media platforms; public visibility provides insight into political relevance, community engagement, and potential conflict. Most of the CLTs listed above have a website and/or a social media presence, providing baseline information on governance, land holdings, objectives, and priorities. Next an assessment on whether a candidate CLT was referenced in news articles or media reports, particularly in relation to land use, development pressures, environmental issues, or community advocacy. This helped identify CLTs that were actively engaged in contested planning environments, where land and water governance intersect with broader political and environmental debates. Based on the criteria and selection framework, Parkdale Neighborhood Land Trust and Muskoka Community Land Trust were selected for the study. The reason an Indigenous CLT was not selected for the comparative analysis section was because they are a newly emerging CLT typology in Ontario. As a result, none of the identified Indigenous CLTs were able to meet the criteria listed above. Indigenous CLTs are however involved in the discussion to understand how they differed from the selected urban and peri-urban CLTs and what lessons they offered for CLTs across Ontario.

Parkdale Neighborhood Land Trust (PNLT; Urban)

The PNLT was selected because it operates in one of Ontario's most intensively planned, politically contested, and ecologically vulnerable urban environments. The Parkdale neighborhood is in Toronto's west end sits at the intersection of the Lower Don River (Don River Watershed), Lower Humber River (Humber River Watershed), and the Toronto Waterfront. This neighborhood, much like the rest of Toronto, is characterized by aging stormwater infrastructure (Sustainability Solutions Group, 2025, p. 18), lack of or deteriorated green spaces (Smee, 2025), heat vulnerability (Bu et al., 2024), and development pressures. These conditions made the PNLT an ideal case for examining how community-based land governance intersects with urban water planning, green infrastructure, and municipal environmental policy.

The PNLT was established in 2010, emerging from urban activist practices in response to gentrification, rising land values, and the loss of affordable housing in the Parkdale neighborhood in Toronto's west end (Bunce and Aslam, 2016, p. 30). The PNLT frames the CLT model as a mechanism for permanently retaining land in community control to support affordable housing, social enterprises,

urban agriculture, and open spaces in a rapidly transforming neighborhood. The City of Toronto's *Official Plan, 2024,* has outlined a number of key initiatives including reducing the adverse effects of stormwater and snow melt, the protection and preservation of trees in the face of development pressures, access and enjoyment of the City's natural features including the Lake Ontario shoreline, access new parks and open spaces, and new green infrastructure such as stormwater management systems (City of Toronto, 2024). All these policies impact the Parkdale neighborhood. The Toronto Region Conservation Authority (TRCA) manages watersheds, ravines, and floodplain systems including in the Parkdale neighborhood (Sustainability Solutions Group, 2025, p. 42). This institutional framing allows this research to examine how the PNLT navigates overlapping municipal, provincial, and conservation authority jurisdictions.

The PNLT is well documented through media coverage, municipal reports, community publications, and collaborations with universities and research institutions. This makes it well suited for document- and policy-based. The PNLT produces detailed reports and studies available on their website. They are featured in various news articles, most recently in the Toronto Star on December 9, 2025. As detailed in the article, the City of Toronto selected the PNLT to lead the development of an estimated 175 new homes in the neighborhood (Reid, 2025). Other key issues that have made the PNLT the subject of new stories include redevelopment debates, conflicts over land use, displacement, gentrification, and environmental and health concerns. This made the PNLT a strong case study for examining how CLTs can influence water-related planning issues in Ontario's environmental planning system.

Muskoka Community Land Trust (MCLT; Peri-urban/exurban)

The MCLT was selected as the peri-urban/exurbian CLT case. The District Municipality of Muskoka is located in central Ontario on the coast of Georgian Bay (Georgian Bay Watershed) in the west, Lake Couchiching (Severn River Watershed) in the south, and Algonquin Provincial Park (Muskoka River Watershed) in the northeast (Kargwal et al., 2025). The last watershed in Muskoka is Black River Watershed in the south. Muskoka spans 6,475 km^2 with dense forests, scenic rocky terrain, and has about 1,600 lakes (Kargwal et al., 2025). As a result of the natural beauty, Muskoka experiences high seasonal tourism which has resulted in a steady decline in rental units, rising property values, and discrepancy between the needs of the permanent residents and the annual tourist population (Kargwal et al., 2025). This creates a planning context where housing, land stewardship, and environmental protection are deeply interconnected. The MCLT was formed in 2021 through collaboration with the local community, planners, developers, and climate advocates (Kargwal et al., 2025). Their pilot project aimed to create 179 units of mixed market, permanently affordable, and climate-resilient rental housing, owned and governed by the community (Kargwal et al., 2025). This made the MCLT a strong case for examining how community-based land governance intersects with peri-urban/exurbian water planning and land stewardship.

A defining feature of the MCLT is its tripartite governance structure which consists of core members, community members, and organizational members (Kargwal et al., 2025). Core members consist of residents in need of core housing, community members consist of local residents, and organizational members consist of non-profits and cooperatives serving the region (Kargwal et al., 2025). This governance approach, while adapted from that of urban CLTs, reflects the social, ecological, and institutional realities of rural Ontario, making the MCLT ideal for the comparative analysis approach (Kargwal et al., 2025). The MCLT explicitly engages with and incorporates climate resilience, environmental stewardship, and sustainable design. Their pilot project integrated low-emissions construction methods to reduce environmental impacts while improving long-term affordability and resilience (Kargwal et al., 2025). The MCLT is well documented through public reports, media coverage, and articles with universities and research institutions. They have their own website with newsletters, surveys, and annual reports. This made the MCLT a well-suited case for document- and policy-based analysis and supported the examination of how differences in power dynamics, institutional barriers, variation in scale, ecological context, and governance structure influence land and water planning outcomes.

3.4 - Data Sources and Collection Methods

This research utilized a mixed-methods data collection approach that integrated document analysis, policy review, and spatial data to examine how CLTs contributed to watershed stewardship, flood mitigation, ecological resilience, and climate resilience in Ontario. The use of multiple types of data sources allowed for a comprehensive understanding of both the institutional, geographical, and environmental contexts in which CLTs operate. Key sources of data included organizational documents produced by CLTs, including annual reports, land stewardship plans, independent studies, project descriptions, and website content. These served as key sources for understanding governance structures and environmental and water planning priorities. These materials provided insight into how CLTs articulated their roles in land and water stewardship and how they engaged with environmental and water planning objectives. Both the PNLT and the MCLT case studies have publicly available documentation that supports this analysis. Spatial datasets that were used for the case studies included flood, tree equity, and watershed maps.

The assessment of watershed stewardship, flood mitigation, ecological resilience, and climate resilience was based on several qualitative and spatial data identified through the literature review, document, and policy analysis. Watershed stewardship was assessed by examining any instance of watershed protection, shoreline management, water quality initiatives, and partnerships supporting water governance carried out by the selected CLTs. Similarly flood mitigation was assessed though documented use of green infrastructure, stormwater management strategies, and other land use strategies intended to

reduce flood risk. Ecological resilience was assessed by identifying conservation, habitat protection, tree canopy preservation, and long-term stewardship strategies. Finally, climate resilience was assessed by examining the selected case studies' responses to climate risks, adaptation strategies, sustainable practices, and NbS. These indicators were interpreted qualitatively using organizational reports, planning documents, and supporting spatial information rather than through a quantitative performance measurement.

Municipal and provincial planning documents were analyzed to contextualize the policy environments in which CLTs operate. Municipal-level documents include Official Plans, Green Infrastructure Strategies, and Climate Resilience Frameworks, which outline local priorities related to stormwater management, environmental protection, and land use planning. At the provincial level, key legislative and policy frameworks, such as the *Provincial Planning Statement, 2024, Conservation Authorities Act, 1990, Lakes and Rivers Improvement Act, 1990,* and the *Ontario Water Resources Act, 1990,* were reviewed to assess how regulatory structures shape opportunities for CLT involvement in environmental governance. These documents provided a basis for evaluating how CLTs aligned with, responded to, or operated within formal planning systems.

Spatial data was analyzed to provide a clearer understanding of geographical and ecological conditions associated with each case study. Open-access datasets from municipal and the provincial governments, conservation authorities, Global Forest Watch, Tree Equity Score, and CLT websites were used to examine environmental indicators. This spatial data was used to understand each CLTs' geographical context and supported the assessment of how environmental conditions influenced planning priorities and land stewardship practices. By linking spatial characteristics with governance and policy analysis, this research was able to identify relationships between geographical, ecological contexts and environmental planning outcomes. The combination of document, policy, and spatial data allowed for a diverse assessment of CLTs' as community-based planning tools. Together, these methods supported a comprehensive evaluation of how each CLT contributed to watershed stewardship, flood mitigation, ecological resilience, and climate resilience in Ontario.

3.5 - Analytical Framework

This research utilized a comparative analytical framework grounded in the principles of EBM, NbS, and sustainable adaptive planning to evaluate how CLTs contributed to watershed stewardship, flood mitigation, ecological resilience, and climate resilience in Ontario. These frameworks provided a conceptual basis for interpreting how governance structures, geographical and ecological contexts, and planning practices interacted within each case study. By integrating these theoretical lenses, the analysis examined the environmental initiatives undertaken by CLTs and how community-based governance systems influenced the implementation of broader planning and sustainability objectives. The analysis

was conducted in three stages: within-case analysis, cross case comparison, and interpretive synthesis. The first stage involved within-case analysis of each of the selected CLT. This process involved a detailed case profile for the PNLT and MCLT, focusing on governance structures, organizational objectives, partnerships, environmental initiatives, as well as geographical and ecological conditions. Particular attention was given to how each CLT engaged with issues related to watershed stewardship, flood mitigation, ecological resilience, and climate resilience. This stage allowed for an in-depth understanding of the internal dynamics of each case and how planning practices are shaped by local institutional and environmental conditions.

The second stage involved cross-case comparison. Comparative matrices were used to identify similarities and differences between the selected cases across several analytical categories, including governance structure, planning context, environmental priorities and conditions, partnerships, and engagement with policy frameworks. This comparative approach enabled the identification of broader patterns regarding how CLTs operationalized EMB, NbS, and sustainable adaptive planning principles across different spatial and governance contexts. It also allowed for the assessment of how factors such as urbanization, watershed conditions, and institutional relationships influenced environmental planning outcomes. The final stage consisted of interpretive synthesis through the theoretical frameworks established in the literature review. EBM was used to assess the extent to which CLTs integrated ecological, social, and governance considerations within their planning practices. NbS provided a framework for analyzing how CLTs incorporated ecological interventions. Sustainable adaptive planning frameworks were applied to examine how CLTs responded to changing environmental conditions, institutional restructuring, and evolving community needs through flexible and participatory governance approaches.

In addition to these frameworks, spatial indicators were interpreted to assess how geographical and ecological conditions shaped planning priorities and environmental strategies. This supported a more comprehensive understanding of how environmental planning operated across different geographic contexts. The analytical framework was also informed by broader discussions of participatory governance and institutional changes. Particular attention was given to how CLTs navigated relationships with municipalities, conservation authorities, and provincial planning systems, especially in the context of recent restructuring of Ontario's conservation authorities (Brown, 2025; Callan & D'Mello, 2026). By examining these institutional relationships, the analysis evaluated the extent to which CLTs function as community-based environmental governance actors within broader planning systems. This analytical framework provided a structured approach for evaluating how CLTs contributed to watershed stewardship, flood mitigation, ecological resilience, and climate resilience in Ontario.

4. Case Studies

4.1 - Urban Context: Parkdale Neighborhood Land Trust

Parkdale is a dense inner-city neighborhood located in Toronto's west end along the northern shoreline of Lake Ontario. Bordered generally by Roncesvalles Avenue to the west, Dufferin Street to the east, and extending north toward Dundas Street West, Parkdale occupies a strategically important urban corridor shaped by major transportation infrastructure, streetcar oriented development, and proximity to High Park and Toronto's waterfront. Due to its proximity to the waterfront, the Parkdale neighborhood is characterized by medium heat vulnerability (Bu et al., 2024). The Parkdale neighborhood has a high concentration of apartments without air conditioning, characteristic of a highly urbanized built environment consisting of apartment towers, single-family houses, mixed-use commercial corridors, and older low-rise residential buildings (Bu et al., 2024; Yoon et al., 2022). Parkdale has historically functioned as an entry point for newcomers and low-income residents due to its relatively affordable rental housing stock and concentration of social services (City of Toronto, 2022). The majority (60%) of recent newcomers to the neighborhood are immigrants (City of Toronto, 2022). The average low income rate in Parkdale is 20% with an unemployment rate sitting at 12.8%, both of which are higher than the average for the City of Toronto (City of Toronto, 2022; Tree Equity Score, 2024). Over the past several decades, the Parkdale neighborhood has experienced increasing redevelopment pressures, rising land values, and intensifying gentrification associated with Toronto's broader housing crisis (Parish, 2020).

Parkdale's social and ecological landscape reflects the uneven geography of urban development in Toronto (Parish, 2020, p. 266). The Parkdale neighborhood contains limited greenspace relative to bordering High Park-Swansea neighborhood and has also been heavily influenced by transportation and grey infrastructure systems (Parish, 2020, p. 278; Tree Equity Score, 2024). At the same time, Parkdale's location adjacent to High Park and the Lake Ontario waterfront places it within a broader urban ecological network. Environmental conditions in the neighborhood are closely tied to issues of heat vulnerability, stormwater management, aging infrastructure, and environmental justice (Sustainability Solutions Group, 2025; Yoon et al., 2022). The Parkdale neighborhood has an average tree canopy cover of 23% (the recommended amount being 50%) and an average tree equity score of 76 (Tree Equity Score, 2024).

Challenges related to urban ecology in Parkdale extend beyond the quantity of green space to include its maintenance and long-term stewardship. A 2025 CBC News article documents community concerns regarding the degradation of publicly dedicated greenspace along the Lansdowne Avenue railway underpass in Parkdale, where neglected vegetation, deteriorating infrastructure, and inadequate maintenance have transformed a once vibrant community green space into a largely underutilized space (Smee, 2025). This case highlights broader concerns with management, accessibility, and the quality of urban green infrastructure within Parkdale and the importance of sustained stewardship in supporting

environmental and community well-being (Smee, 2025). Parish (2020) highlights that greening initiatives and urban ecological improvements in Parkdale have become increasingly entangled with environmental gentrification, where urban nature and sustainability projects contribute to broader patterns of displacement and socio-spatial inequality (p. 270). Parkdale's ecological landscape is therefore inseparable from its social and political dynamics, particularly surrounding housing, affordability, displacement, and access to community space (Yoon et al., 2022, p. 15).

Parkdale occupies an important position within Toronto's Lake Ontario shoreline and urban watershed system (Sustainability Solutions Group, 2025). The neighborhoods high proportion of impervious surfaces (Tree Equity Score, 2024), aging water infrastructure (Yoon et al., 2022, p. 27), and dense urban development contribute to increased stormwater runoff and place additional pressure on Toronto's stormwater management system during extreme precipitation events (Sustainability Solutions Group, 2025, p. 18; Yoon et al., 2022, p. 27). As climate change impacts the frequency and severity of heavy rainfall events across Southern Ontario, neighborhoods like Parkdale have become increasingly vulnerable to localized flooding, sewer surcharging, and degrading water quality (Sustainability Solutions Group, 2025; Toronto Region Conservation Authority, 2018). As recently as July 2026, multiple beaches across Toronto tested unsafe for swimming due to an E. coli outbreak (Torstar Open Data Team, 2026).

The City of Toronto has experienced an increasing frequency of extreme rainfall and urban flooding events over the past decade, highlighting the growing impact of climate change on municipal infrastructure and watershed management (Sustainability Solutions Group, 2025). The first major flooding event occurred on August 7th, 2018, when intense rainfall overwhelmed parts of the downtown core and the west end causing notable overflowing of Black Creek (Mann, 2019). The second major flooding event occurred on July 16th, 2024, when three successive severe storms dumped nearly 1 meter of rain in the span of three hours across the City and caused almost $1 billion in damage (Howes, 2025). The storms flooded low-lying neighborhoods including Parkdale, streets, and highways. The third major flooding event occurred exactly one month after the July 2024 flooding. On August 17th to the 18th another major storm event dumber another one meter of rain across the City on already saturated ground and once again flooding low-lying neighborhoods, streets, and highways (Aguilar & Arsenych, 2024). These recurring flood events highlight the increasing importance of flood mitigation, green infrastructure, watershed planning, and climate adaptation within highly urbanized neighborhoods like Parkdale.

Within this context, the PNLT has emerged as one of Toronto's first neighborhood-based CLTs that contributes to environmental planning by promoting long-term stewardship, climate resilience, neighborhood greening, and sustainable development. Founded in 2012, the PNLT developed in response to escalating displacement pressures, loss of affordable housing, and increasing privatization of community space in the Parkdale neighborhood (Parish, 2020, p. 270; Wandio & Barndt, 2024, p. 10).

The organization operates through a membership-based, community-controlled governance model focused on acquiring, owning, and stewarding land for community benefit. The PNLT's charitable arm, the Neighborhood Land Trust (NLT), owns and stewards properties that support affordable housing, supportive housing, and community economic development (Wandio & Barndt, 2024, p. 6). The development of the PNLT reflects broader traditions of community-based planning and participatory governance. During its early organizational development between 2012 and 2017, the PNLT focused heavily on mobilizing support, establishing community governance structures, and conducting neighborhood-based planning and research initiatives (Wandio & Barndt, 2024, p. 7). This included the *Parkdale Planning Study* (2016) and the *Parkdale Rooming House Study* (2017), which documented local housing conditions and identified the rapid loss of affordable rental housing (Wandio & Barndt, 2024, p. 7). Through these initiatives, the PNLT positioned itself as a community planning actor capable of generating localized knowledge and influencing municipal policy.

The PNLT's growth has increasingly relied on partnerships with the City of Toronto and other institutional actors and corporations. According to the 2024 report titled *The Path to a City-CLT Partnership*, the PNLT developed through a collaborative relationship with the City of Toronto through its work on affordable housing preservation, homelessness prevention, and policy development (Goldstein & Barndt, 2024, p. 7). The report identifies several areas of alignment between municipalities and CLTs, including affordable housing, stewardship, land-use planning, homelessness prevention, and community benefit management. Through these partnerships, the PNLT contributed to policy initiatives such as the Dwelling Room Preservation Policy Framework and the preservation of at-risk affordable rental housing (Goldstein & Barndt, 2024, p. 9-10). These collaborations demonstrate how CLTs can function as intermediary governance institutions that bridge community-based stewardship with formal municipal planning systems.

The organizational scaling of the PNLT further illustrates the adaptive and community-based nature of its governance model. Between 2018 and 2023, the NLT acquired eighty-five properties consisting of over two hundred affordable rental units, significantly expanding its role within Toronto's non-market housing sector. The PNLT's growth was supported through multi-sectoral partnerships, acquisition strategies, and expanded governance and asset management structures (Wandio and Barndt, 2024, p. 4). In their 2024 report, Wandio and Barndt highlight that this growth involved the acquisition of land alongside the enhancement of community governance systems, tenant engagement structures, and long-term stewardship practices (p. 19). This reflects the principles of adaptive planning, where governance systems evolve in response to changing organizational and environmental conditions.

Environmental sustainability and climate resilience have also become increasingly central to PNLT's activities as climate change has intensified environmental risks within Toronto's urban

neighborhoods. The *Social Procurement and Sustainability Action Framework Report* highlight the environmental planning, climate resilience, and community development initiatives carried out by the PNLT (Yoon et al., 2022). The report outlines a comprehensive strategy linking affordable housing preservation with community economic development, green infrastructure, and climate resilience. The report identifies four interconnected impact areas: community economic development, decent work, environmentally responsible buildings, and community climate resilience that collectively promote long-term environmental and social sustainability (Yoon et al., 2022, p. 4). Through its environmentally responsible buildings strategy, the PNLT prioritizes energy audits, building retrofits, capital improvement planning, GHG reductions, environmentally responsible procurement, circular economy principles, waste reduction, green infrastructure, and ecosystem improvements across its housing portfolio (Yoon et al., 2022, p. 7–8). These initiatives reflect the principles of EBM by integrating environmental, social, and economic considerations into land stewardship and building management while promoting more sustainable urban development. The framework also adopts principles of adaptive planning by requiring climate vulnerability and risk assessments during project planning, incorporating measurable environmental performance indicators, and promoting the continuous monitoring of energy use, GHG emissions, and sustainability outcomes to inform future decision-making (Yoon et al., 2022, p. 7-9, 27-28). In addition, the PNLT advances community climate resilience by developing partnerships with community organizations, preparing climate resilience plans, mitigating flood risk, helping to increase green spaces, supporting community gardens, and encouraging tenant-led environmental initiatives (Yoon et al., 2022, p. 9, 19–22). These initiatives operationalize NbS principles through urban greening, biodiversity enhancement, ecosystem improvement, and green infrastructure, thereby contributing to broader environmental planning goals while strengthening the adaptive capacity of both communities and urban ecosystems (Yoon et al., 2022, p. 8–9, 27–28).

The PNLT illustrates how CLTs can contribute to environmental planning beyond their traditional role in affordable housing preservation. Through community-based land stewardship, neighborhood planning, climate resilience initiatives, environmentally responsible building practices, and partnerships with municipal governments, the PNLT has contributed to broader objectives related to environmental governance, urban sustainability, and community resilience (Yoon et al., 2022). Although the organization does not directly contribute to watershed management or flood mitigation infrastructure, its emphasis on long-term stewardship, community participation, and sustainable land use aligns closely with the principles of EBM, NbS, and sustainable adaptive planning. While the organization has strived to incorporate climate resilience and environmental sustainability into its strategic priorities (Yoon et al., 2022), relatively limited attention has been given to watershed stewardship and stormwater management. As climate change continues to increase the frequency and severity of extreme weather events across

Toronto (Sustainability Solutions Group, 2025), urban CLTs such as the PNLT present perfect opportunities to expand their contributions to water and environmental planning, watershed management, and climate resilience in Ontario, alongside partnerships with conservation authorities, municipalities, and other community organizations.

4.2 - Peri-urban/Exurbian Context: Muskoka Community Land Trust

The District Municipality of Muskoka is a rural regional municipality located in Central Ontario. It is bordered by Algonquin Provincial Park to the east, Georgian Bay to the west, Simcoe County to the south, and Parry Sound to the north. The District of Muskoka spans 6,475 km^2 and includes notable towns such as Huntsville, Bracebridge, and Gravenhurst. Some other notable areas include the townships of Muskoka Lakes, Georgian Bay, and Lake of Bays (Marsh & Dale, 2023). Muskoka had a permanent population of about 66,674 residents in 2021, with an estimated seasonal population of up to 100,000 seasonal residents (Government of Canada, 2021). These seasonal residents combined with an additional 2.4 - 4 million seasonal visitors annually (The District Municipality of Muskoka, 2019) results in significant population fluctuations throughout the year. As a result, the fluctuating resource demand, especially during the summer months, has created several significant gaps, challenges, and barriers for permanent residents especially in the number of housing and rental units available in the region (Kargwal et al., 2025). Housing in Muskoka varies greatly depending on the area, including single-family detached homes in more rural areas to townhouses, semi-detached, apartments, and condominiums in the urban centers including in the various towns.

Muskoka's geographic and ecological landscape reflects its location within Ontario's Great Lakes-St. Lawrence forest region. The region is characterized by rugged Canadian Shield topography, extensive freshwater systems, and over 1600 lakes connected through nineteen watersheds that originate from or near Algonquin Provincial Park and flow westward into Georgian Bay (Marsh & Dale, 2023). The Muskoka region is a geographic transitional zone containing a mix of the deciduous forests that dominate Southern Ontario and coniferous/boreal forests that dominate Northern Ontario (Marsh & Dale, 2023). This unique mix of forests is what has made the District of Muskoka a historically important region for the logging industry throughout the 19th and 20th century. It was during this period in which towns like Huntsville, Bracebridge, and Gravenhurst were established. The District of Muskoka remains ecologically significant. As of 2020, approximately 69% of Muskoka's land cover consisted of natural forests, representing 310,000 ha of forested land, while overall tree cover exceeded 80% of the district's land area (Hansen et al., 2023; Global Forest Watch, 2025). Between 2000 and 2020, Muskoka experienced a net gain of approximately 6,200 ha of tree cover, highlighting the continued ecological importance of the region despite ongoing development pressures (Hansen et al., 2023; Global Forest Watch, 2025). Forest carbon monitoring further shows that Muskoka's forests function as important

regional carbon sinks, helping to extract approximately 1.5 $MtCO_2e$ annually between 2001 and 2025 (Harris et al., 2021; Gibbs et al., 2025). The mix of forests as well as Muskoka's proximity to Georgian Bay make it home for many animal species including two-hundred and fifty species of birds, nearly fifty kinds of mammals, twenty-five types of reptiles and amphibians, and dozens of species of fish. Muskoka is also home to over thirty documented species at risk and endangered species (Marsh & Dale, 2023). These ecological assets contribute significantly to biodiversity conservation, watershed health, climate regulation, and the tourism economy.

The District of Muskoka is experiencing increased environmental changes as a result of climate change, tourism development projects, and waterfront development. Some of the environmental issues include increases in flooding, loss of forested areas, shoreline erosion, threats to water quality, and to biodiversity and natural habitat. Forest monitoring data indicates that Muskoka lost approximately 4,400 ha of tree cover between 2001 to 2005, with much of the loss attributed to logging, settlement expansion, and infrastructure development (Hansen et al., 2013; Global Forest Watch, 2025). In the last few years there has also been an alarming increase in the concentration of chloride found in Muskoka lakes (Simard, 2026). Recent monitoring initiatives of chloride concentration have been carried out by the Friends of Muskoka Watershed. One of the main sources of the chloride pollution is from the application of road salts in and around private properties owned by seasonal residents (Simard, 2026). This increase in chloride concentration can have significant impacts on the waterways threatening the aquatic ecosystems and the ecological integrity of Muskoka's lakes (Simard, 2026).

Development related to seasonal tourism in Muskoka began in the late 19th century. These early seasonal tourists consisted primarily of wealthy American families who established extravagant summer homes along the various waterfronts (Marsh & Dale, 2023). In 1894 the Muskoka Lakes Association was established as the first Canadian organization that represented cottagers (Marsh & Dale, 2023). There was a notable decline in the economy and seasonal tourists post-WWI, however, post-WWII and with the advent of highway expansion in the region, seasonal tourism and the economy began to spike to its current form (Marsh & Dale, 2023). This steady increase in seasonal tourism and residents has led to a significant increase in hotels and cottages, numerous summer camps, outdoor recreation centers and retreats. An increase in the seasonal population alongside the increase in economic activity in the region has also resulted in numerous golf courses, more retail stores, and restaurants opening in the region (Marsh & Dale, 2023). While tourism remains a major economic driver, it has also contributed to Muskoka's housing affordability crisis. Rising land values, increasing demand for seasonal properties, and continued seasonal population fluctuations have resulted in escalating housing and rental costs, making it increasingly difficult for permanent residents to secure affordable housing (G.R.E.A.T. Housing, 2024, p. 9-10).

The MCLT was established in 2021 to address the growing housing affordability crisis in Muskoka, driving the rising cost of land, limited rental supply, and pressures on the local community arising from tourism-based seasonal economies (Kargwal et al., 2025). The MCLT utilizes a tripartite governance model adapted to the social and ecological needs of rural Ontario (Kargwal et al., 2025). Beyond housing affordability, the MCLT explicitly incorporates climate resilience, environmental stewardship, and sustainable development into its governance and planning approach, reflecting the interconnected nature of environmental and community planning in Muskoka (Kargwal et al., 2025). The tripartite governance structure reflects the unique social, ecological, and institutional realities of peri-urban Ontario. By incorporating multiple stakeholder groups into the decision-making process, the MCLT is able to maintain democratic governance while strengthening community participation and accountability.

The MCLT's approach aligns closely with NbS and adaptive management frameworks (Raymond et al., 2017; Kaplan-Hallam & Bennett, 2018). The Florence Street Micro-Community Initiative represents the practical implementation of these objectives; the MCLT's pilot project aims to integrate low-emissions construction methods to reduce environmental impacts while improving long-term affordability and resilience (Kargwal et al., 2025). To fund the initiative, the MCLT alongside several community and construction groups co-founded the Green Resilient Environmental Affordable Together (GREAT). GREAT's mission is to create permanently affordable housing that is community-owned, environmentally sustainable, and resilient to climate change while maintaining long-term affordability (G.R.E.A.T. Housing, 2024). The Florence Street Micro-Community Initiative is located in the Town of Huntsville at 40 Lawrence Street West. The initiative proposes the development of 179 mixed-market and permanently affordable rental units that will remain under community ownership and governance (Kargwal et al., 2025; MCLT, 2025). The initiative is intended to create community wealth that will be preserved indefinitely, demonstrating that affordable housing can simultaneously support social equity, environmental sustainability, and climate resilience (MCLT, 2025).

During the first phase of the Florence Street Micro-Community Initiative, the MCLT engaged in community engagement activities to learn more about the community's needs and suggestions for the initiative (MCLT, 2025). In total 180 community members and residents were able to participate through surveys, focus groups, and meetings held in August and November of 2024 (MCLT, 2025). Some of the findings of the community engagement activities include a high demand for accessible, reasonably priced rental properties that serve a range of residents, including families, low-income workers, and seniors (MCLT, 2025). Environmental sustainability was identified as another priority, highlighted through ideas for community gardens, energy-efficient structures, and outdoor leisure places (MCLT, 2025).

The Florence Street Micro-Community Initiative documentation emphasizes the use of low-carbon construction methods, cross-laminated timber, and high-performance building systems designed to reduce operational and embodied carbon emissions while improving long-term affordability and durability (MCLT, 2025; Kargwal et al., 2025). Proposed building designs are expected to consume approximately 60% less energy than conventional code-compliant buildings while significantly reducing greenhouse gas emissions over their lifecycle (G.R.E.A.T. Housing, 2024; Kargwal et al., 2025; MCLT, 2025). The project explicitly frames climate resilience as a community planning objective, recognizing that affordable housing and environmental sustainability are fundamentally interconnected challenges. The Florence Street project's first phase is expected to be completed with units available for occupancy in the fall of 2027 (G.R.E.A.T. Housing, 2024). The way in which the MCLT has so far carried out the Florence Street Micro-Community Initiative is identical to the recommendations for implementing successful NbS projects (Raymond et al., 2017, p. 18-19)

The MCLT demonstrates how community land trusts can progress beyond standard housing affordability goals and become vehicles for environmental planning and climate adaptation. Unlike urban land trusts like the PNLT, which focus on displacement, housing affordability, and environmental justice in densely populated areas, the MCLT operates in a peri-urban landscape marked by watershed management challenges, biodiversity conservation priorities, seasonal development pressures, and climate-related environmental change. The MCLT demonstrates how community land trusts can implement ecosystem-based management, nature-based planning principles, and adaptive governance in Ontario's rural and peri-urban contexts by emphasizing sustainable development, climate resilience, and long-term community stewardship.

4.3 - Summary Table

Table 2

Summary of frameworks utilized by the PNLT and MCLT for contributions to environmental and water planning, watershed management, and climate resilience

	Parkdale Neighbourhood Land Trust (Urban)	Muskoka Community Land Trust (Peri-urban)
Ecosystem-Based Management (EBM)	• Integrates environmental, social, and economic objectives through community-based land stewardship and affordable housing. • Long-term stewardship of community-owned properties. • Partnerships with the City of Toronto and community organizations.	• Integrates housing, ecological conservation, and sustainable development within the Florence Street Micro-Community Initiative. • Long-term community ownership and stewardship of land. • Community-led governance incorporating multiple stakeholder groups.

	• Environmentally responsible building management and procurement. • Climate resilience integrated into organizational governance.	• Balances environmental protection, housing affordability, and economic sustainability within lake and forest ecosystems.
Nature-Based Solutions (NbS)	• Green infrastructure incorporated into property improvements. • Biodiversity and green space enhancement. • Community gardens and urban agriculture (87 Milky Way). • Ecosystem improvement and urban greening initiatives. • Tenant-led environmental initiatives and biodiversity projects.	• Community gardens incorporated into neighbourhood design. • Low-impact site design integrated into the Florence Street project. • Sustainable building materials • Low-carbon construction methods. • Protection of surrounding natural systems through environmentally sensitive development.
Sustainable Adaptive Planning	• Capital improvement plans with environmental performance metrics. • Energy audits and retrofit planning. • Continuous monitoring of energy use, GHG emissions, and sustainability outcomes. • Climate resilience plans addressing flooding, extreme heat, and power outages. • Adaptive governance through community participation and organizational learning.	• Extensive community engagement through surveys, focus groups, and public meetings. • Adaptive governance using a tripartite governance structure. • Phased implementation of the Florence Street development. • Ongoing incorporation of community feedback into project design. • Long-term planning for affordability, climate resilience, and sustainable growth.
Environmental / Water Planning Contributions	• Supports sustainable land use planning. • Improves environmental performance of buildings .• Promotes urban greening and ecosystem enhancement. • Addresses flood risk through climate resilience planning. • Contributes indirectly to stormwater management and environmental quality through green infrastructure and sustainable development.	• Integrates environmental sustainability into community planning. • Reduces greenhouse gas emissions through high-performance buildings. • Supports watershed protection by encouraging environmentally sensitive development. • Reduces development pressures on forests and lakes through compact community design. • Incorporates climate adaptation into long-term planning.

Watershed Management Contributions	• Indirect contribution through urban greening, green infrastructure, sustainable land stewardship, and climate resilience planning.	• Moderate indirect contribution through sustainable land development that helps protect surrounding watersheds, forests, and lakes.
Climate Resilience Contributions	• Energy retrofits. • Greenhouse gas reduction. • Climate resilience planning. • Flood preparedness. • Biodiversity enhancement. • Urban greening. • Tenant education. • Community partnerships. • Community gardens and social resilience initiatives.	• Low-carbon construction. • High-performance buildings • Climate-resilient community design. • Long-term affordability reducing climate vulnerability. • Sustainable construction materials. • Community engagement supporting adaptive capacity.
Key Limitations / Future Opportunities	Strong environmental planning framework, but relatively limited direct involvement in watershed stewardship, stormwater management, and water quality initiatives. Significant opportunities exist to collaborate with TRCA, municipalities, and watershed organizations on green infrastructure, flood mitigation, and urban watershed restoration.	Strong emphasis on sustainable development and climate resilience, but environmental planning remains largely project specific. Future initiatives could incorporate watershed-scale planning, lake stewardship, shoreline restoration, biodiversity monitoring, and formal partnerships with conservation authorities and watershed organizations.

5. Comparative Analysis and Discussion

5.1 - Introduction

This chapter synthesizes the findings from the PNLT and MCLT case studies to evaluate how CLTs can utilize EBM, NbS, and adaptive planning frameworks to contribute to watershed stewardship, flood mitigation, ecological resilience, and climate resilience. While both organizations share the common objectives of community land stewardship, permanently affordable housing, and participatory governance, they operate within distinct geographical, ecological, institutional, and socio-political contexts. Consequently, the environmental planning strategies adopted by each organization differ according to the opportunities and constraints presented by their distinct contexts. The PNLT operates within the City of Toronto's highly urbanized landscape, where environmental planning objectives are outlined in the City of Toronto *Official Plan, 2024*. Key initiatives include reducing the adverse effects of stormwater and snow melt, the protection and preservation of trees in the face of development pressures, access and enjoyment of the City's natural features, access to new parks and open spaces, and new green

infrastructure (City of Toronto, 2024). In contrast, the MCLT operates within a peri-urban context, where environmental planning objectives are outlined in the *Muskoka Official Plan, 2025*. Key initiatives include biodiversity conservation, climate change adaptation, watershed planning, stormwater management, forest management, shoreline and water quality protection, and sustainable rural development (The District of Muskoka Community and Planning Services Department, 2025).

The objective of this chapter is to conduct a comparative analysis of how each of the selected case studies contributes to watershed stewardship, flood mitigation, ecological resilience, and climate resilience through the analytical frameworks of EBM, NbS, and adaptive planning. This chapter examines how the frameworks intersect within each CLT's governance model to influence long-term stewardship, environmental decision-making, and community resilience. The planning outcomes provide a common analytical framework through which the contributions of both organizations can be evaluated given their differing geographic, ecological, institutional, and socio-political contexts. This highlights the heavy influence of differing contexts on the application of EBM, NbS, and sustainable adaptive planning, reinforcing the importance of context-specific environmental planning rather than universal planning models. The comparative analysis will be complemented by a discussion of a newly emerging third CLT typology in Ontario: Indigenous CLTs and Indigenous Protected and Conserved Areas (IPACs). The purpose of this discussion is to examine how this newly emerging CLT typology differs from urban and peri-urban CLTs and what lessons they can offer for CLTs across Ontario. By conducting a comparative analysis of CLTs across Ontario's diverse urban and peri-urban contexts, as well as a discussion of newly emerging Indigenous contexts, this study explores how varied forms of governance shape environmental and water management as both natural and cultural resources, essential to ecological health and community well-being.

5.2 - Comparative Analysis of the PNLT and MCLT Case Studies

Both the PNLT and MCLT have increasingly adopted environmental planning objectives that reflect broader EBM, NbS, and sustainable adaptive planning frameworks. These frameworks are, however, implemented differently according to each organization's geographical context, ecological setting, governance structure, and planning priorities. These two case studies demonstrate the variation that exists among CLT typologies in Ontario and that CLTs are highly adaptive governance institutions whose environmental contributions are shaped by local environmental conditions, community needs, and the institutional contexts in which they operate. A significant distinction between the two case studies lies in the geographical and ecological contexts within which they operate. The PNLT functions within the Parkdale neighborhood in the City of Toronto, one of Canada's most densely developed urban centers, where decades of urbanization have resulted in extensive impervious surfaces, aging infrastructure, fragmented greenspace, and increasing environmental inequalities (Parish, 2020, p. 266, 270, 278; Tree

Equity Score, 2024). Consequently, environmental planning within Parkdale focuses primarily on improving environmental conditions within an already modified urban landscape. In contrast, the MCLT operates within the District Municipality of Muskoka, a region characterized by interconnected forests, lakes, wetlands, and nineteen major watersheds that support significant ecological functions (Marsh & Dale, 2023; Global Forest Watch, 2025). Environmental planning within Muskoka therefore extends toward maintaining broader landscape connectivity and ecological integrity (The District of Muskoka Community and Planning Services Department, 2025). These contrasting environmental contexts fundamentally influence how each organization interprets stewardship, resilience, and long-term planning.

Each organization demonstrates how housing affordability, environmental sustainability, climate adaptation, and community well-being are mutually reinforcing components of long-term community development (Loucks & van Beek, 2017, p. 43-45). The PNLT has increasingly embedded environmental considerations within its affordable housing initiatives through environmentally responsible building retrofits, green infrastructure improvements, sustainable procurement practices, biodiversity enhancement, community gardens, and climate resilience planning (Yoon et al., 2022, p. 4, 7-9, 19-22). Likewise, the MCLT's Florence Street Micro-Community Initiative demonstrates that affordable housing can be integrated with environmentally sustainable design through low-carbon construction methods, high-performance buildings, community engagement, and long-term stewardship of community-owned land (G.R.E.A.T. Housing, 2024; Kargwal et al., 2025; MCLT, 2025). In both cases, environmental sustainability is incorporated into organizational governance rather than treated as a separate planning objective, reflecting the holistic perspective promoted by ecosystem-based management (McAfee & Malouin, 2008, p. 7-8; Loucks & van Beek, 2017, p. 45).

The scale at which environmental planning objectives are implemented differs considerably between the two organizations. The PNLT primarily operates at the neighborhood scale, where environmental planning focuses on improving the environmental performance of individual buildings, expanding urban green space, increasing community participation, and enhancing resilience within Toronto's built environment (Yoon et al, 2022). These initiatives respond directly to challenges associated with increasing urban density, environmental injustice, aging infrastructure, and climate-related risks including flooding and extreme heat (Yoon et al, 2022, Bu et al., 2024; Sustainability Solutions Group, 2025). In comparison, the MCLT adopts a broader perspective that reflects the geographical ecological characteristics of Muskoka and considers the cumulative impacts of development on forests, watersheds, lakes, and biodiversity while seeking to balance long-term ecological protection with community development and housing affordability (Kargwal et al., 2025; The District of Muskoka Community and Planning Services Department, 2025, p. 19). This broader ecological perspective aligns closely with

Ontario's watershed-based planning approaches, which recognize that environmental management must account for the interconnected nature of ecological systems (Ministry of Municipal Affairs and Housing, 2024, p. 21-22).

These differences become particularly evident when examining how each organization contributes to watershed management. Both organizations contribute indirectly to watershed management through their approaches to land stewardship and environmental planning. However, the nature and scale of these contributions differ substantially. Within Parkdale, watershed stewardship is largely associated with improving the environmental performance of an already urbanized landscape. The neighborhood's extensive impervious surfaces, limited tree canopy, aging stormwater infrastructure, and proximity to the Lake Ontario shoreline create conditions that increase stormwater runoff, reduce infiltration, heighten flood risks, and decline water quality (Tree Equity Score, 2024; Sustainability Solutions Group, 2025; Yoon et al., 2022, p. 19-20). Consequently, many of the PNLT's environmental initiatives, including urban greening, biodiversity enhancement, green infrastructure, community gardens, and climate resilience planning, indirectly contribute to urban watershed health by increasing vegetation, improving local environmental conditions, and promoting more sustainable land management practices (Yoon et al., 2022, p. 7-9, 19-22). While these initiatives do not directly manage watersheds or stormwater infrastructure, they illustrate how neighborhood-scale stewardship can complement broader municipal and provincial watershed planning objectives.

The MCLT contributes to watershed management through a different pathway, one that is inherently linked to watershed protection, freshwater quality, shoreline management, and forest conservation (Kargwal et al., 2025). The region's extensive network of lakes and interconnected watersheds means that land-use decisions have direct implications for hydrological processes, aquatic ecosystems, and regional biodiversity (Marsh & Dale, 2023; The District of Muskoka Community and Planning Services Department, 2025, p. 20). The Florence Street Micro-Community Initiative demonstrates how sustainable community development can reduce long-term environmental pressures by focusing development within existing urban areas while incorporating environmentally sustainable construction methods and community-oriented design principles (G.R.E.A.T. Housing, 2024; Kargwal et al., 2025). Although the MCLT does not directly undertake watershed restoration or water quality monitoring, its emphasis on environmentally sustainable development, community stewardship, and long-term land ownership helps reduce pressures associated with dispersed development and continued encroachment into ecologically sensitive landscapes (G.R.E.A.T. Housing, 2024; Kargwal et al., 2025). Compared to the PNLT, whose contribution to watershed stewardship is primarily urban and indirect, the MCLT operates within a landscape where virtually every planning decision has broader implications for watershed integrity and ecological resilience.

The comparison also illustrates differing approaches to climate resilience that reflect each organization's surrounding environmental conditions. The PNLT has increasingly prioritized climate adaptation in response to the growing frequency of extreme weather events affecting Toronto. Recent major flooding events, combined with increasing heat vulnerability, and aging municipal infrastructure, have reinforced the importance of integrating climate resilience into neighborhood planning (Sustainability Solutions Group, 2025). In response, the PNLT's *Social Procurement and Sustainability Action Framework* incorporates climate vulnerability assessments, greenhouse gas reduction targets, environmentally responsible building retrofits, flood preparedness, biodiversity enhancement, and community resilience planning into the organization's long-term governance strategy (Yoon et al., 2022, p. 7-9, 19-22, 27-28). These initiatives highlight that climate resilience should extend beyond physical infrastructure to include governance capacity, community participation, and adaptive decision-making. The PNLT adopts an integrated approach that recognizes the importance of combining environmental improvements with social resilience, affordable housing preservation, and community stewardship (Yoon et al., 2022).

The MCLT similarly demonstrates a strong commitment to climate resilience that seeks to reduce future environmental impacts through sustainable community development and low-carbon development practices. The Florence Street Micro-Community Initiative incorporates cross-laminated timber construction, high-performance building envelopes, and energy-efficient building systems capable of reducing operational energy consumption by approximately 60% compared to conventional construction (G.R.E.A.T. Housing, 2024; Kargwal et al., 2025; MCLT, 2025). These initiatives reduce GHG emissions while also improving the long-term resilience of affordable housing against future climate conditions. Unlike the PNLT, whose climate resilience initiatives are largely adaptive responses to existing urban environmental conditions, the MCLT adopts a more preventative approach by incorporating sustainability principles into the design of new development before environmental impacts occur. Together, these two planning approaches illustrate the complementary nature of climate adaptation and climate mitigation within CLT governance approaches.

The differing environmental contexts also influence how each organization contributes to flood mitigation. Flooding has become one of the defining environmental planning challenges within the City of Toronto as climate change has increased both the frequency and intensity of extreme precipitation events (Sustainability Solutions Group, 2025). Frequent major flooding events in the last ten years have exposed the vulnerability of highly urbanized neighborhoods such as Parkdale, where impervious surfaces, aging sewer infrastructure, and limited green infrastructure increase stormwater runoff and reduce infiltration (Howes, 2025; Aguilar & Arsenych, 2024; Mann, 2019). Although the PNLT does not construct or manage flood control infrastructure, its emphasis on environmentally responsible buildings,

green infrastructure, and climate resilience planning contributes indirectly to municipal flood mitigation objectives by promoting land management practices that improve environmental performance at the neighborhood scale (Yoon et al., 2022, p. 7-9, 19-22). These initiatives demonstrate that community organizations can complement conventional engineering approaches by increasing vegetation, strengthening local stewardship, and encouraging more resilient patterns of urban development. Nevertheless, the PNLT's contribution to flood mitigation remains constrained by its organizational mandate and limited jurisdiction over broader watershed infrastructure. Opportunities therefore exist for stronger collaboration with the City of Toronto, TRCA, other CLTs in Toronto, and watershed organizations to better integrate community-based stewardship with municipal stormwater management, shoreline protection, and water quality improvement strategies (Loucks & van Beek, 2017, p. 527-529).

Flood mitigation within Muskoka presents a different planning challenge, one that is closely connected to maintaining healthy forests, wetlands, riparian areas, and natural hydrological processes across interconnected lake and watershed systems (The District of Muskoka Community and Planning Services Department, 2025, p. 31-32). Consequently, the MCLT contributes to flood resilience primarily through sustainable land development practices that minimize ecological disturbance and reduce long-term development pressures on environmentally sensitive landscapes (G.R.E.A.T. Housing, 2024; Kargwal et al., 2025). By promoting compact community development, environmentally sustainable building practices, and permanent community ownership of land, the MCLT reduces the likelihood that future development will contribute to unnecessary forest fragmentation, increased runoff, or degradation of natural drainage systems (G.R.E.A.T. Housing, 2024; Kargwal et al., 2025). These EBM and NbS approaches to watershed management demonstrate that maintaining healthy ecosystems is one of the most effective long-term strategies for reducing flood risk and improving environmental resilience (Loucks & van Beek, 2017, p. 44). This comparison highlights the distinction in the way flood mitigation is interpreted differently across the two planning contexts: within Parkdale it focuses on adapting an already urbanized environment to increasing climate risks, whereas in Muskoka it emphasizes protecting the ecological systems that naturally regulate hydrological processes before they become significantly degraded.

Ecological resilience similarly emerges through different pathways across the two case studies. In Parkdale, ecological resilience is largely associated with improving the quality of highly modified urban ecosystems through incremental environmental improvements. The neighborhood’s relatively low tree canopy, fragmented greenspaces, and ongoing redevelopment pressures have created an environment where ecological restoration must occur alongside continued urban growth (Parish, 2020; Tree Equity Score, 2024). The PNLT's environmental initiatives therefore emphasize increasing biodiversity, expanding green spaces, encouraging community gardens, improving building performance, and

strengthening long-term stewardship of community-owned properties (Yoon et al., 2022, p. 8–9). These initiatives contribute meaningfully to strengthening ecological resilience within one of Ontario's most densely populated urban environments. They also demonstrate that ecological resilience within cities depends upon restoring natural systems while also strengthening community capacity to manage environmental change through collective stewardship and participatory governance (Loucks & van Beek, 2017, p. 558).

The MCLT operates within a landscape where ecological resilience is more directly associated with maintaining ecosystem integrity across forests, lakes, wetlands, and wildlife habitats (Kargwal et al., 2025). Development decisions, therefore, have broader implications for biodiversity conservation, carbon storage, freshwater protection, and regional ecosystem connectivity in Muskoka (The District of Muskoka Community and Planning Services Department, 2025; Global Forest Watch, 2025). The MCLT seeks to ensure that future development proceeds in ways that maintain the ecological functions upon which the region depends (Kargwal et al., 2025). This approach aligns closely with the principles of sustainable adaptive planning by recognizing that long-term resilience requires anticipating future environmental pressures rather than responding only after ecological degradation has occurred (Loucks & van Beek, 2017, p. 40-45).

Another important finding from this comparative analysis concerns the role of governance in supporting environmental resilience. Although the environmental initiatives undertaken by both organizations differ substantially, each organization relies upon highly collaborative governance arrangements that emphasize long-term stewardship, community participation, and partnerships across multiple sectors. The PNLT has developed extensive collaborations with the City of Toronto, community organizations, housing providers, and residents to advance affordable housing preservation, neighborhood planning, and environmental sustainability (Goldstein & Barndt, 2024; Wandio & Barndt, 2024). Similarly, the MCLT has relied upon partnerships with municipalities, construction partners, community organizations, G.R.E.A.T. Housing, and residents to guide the planning and implementation of the Florence Street Micro-Community Initiative (Kargwal et al., 2025; MCLT, 2025). These governance arrangements illustrate that adaptive planning requires continuous learning, collaborative decision-making, and the capacity of organizations to modify their approaches as environmental, social, and institutional contexts evolve (Loucks & van Beek, 2017, p. 40).

Taken together, these findings reinforce one of the central arguments of this research that EBM, NbS, and sustainable adaptive planning principles are flexible governance frameworks capable of responding to diverse geographical, ecological, institutional, and community contexts. The comparative analysis identifies several opportunities for future environmental planning practice within Ontario's CLT sector. Although both organizations demonstrate meaningful contributions to environmental

sustainability, relatively limited attention has been directed toward formal watershed governance, IWRM, and direct collaboration with conservation authorities. As the intersection of climate change, rapid urbanization, and ecological degradation are increasingly shaping environmental planning in Ontario, CLTs are well positioned to expand their environmental role through stronger partnerships with municipalities, conservation authorities, watershed organizations, Indigenous communities, and other environmental agencies. Such collaborations would allow Ontario CLTs to build upon their existing strengths while contributing more directly to watershed stewardship, flood mitigation, ecological resilience, and climate resilience.

5.3 - Emerging Indigenous-led Land Trust (Protected Areas) Models in Ontario

Although this research focuses on PNLT and the MCLT case studies, it is also important to consider the recent emergence of Indigenous-led land trusts and protected areas models within Ontario's broader environmental planning landscape. Indigenous-led land governance is grounded in Indigenous rights, responsibilities, legal traditions, and long standing relationships with land and water (Mansuy et al., 2023, p. 1-2). Indigenous-led trusts and Indigenous Protected and Conserved Areas (IPACs) are not another variation of the CLT model, but a distinct governance systems that share many of the same principles of long-term stewardship, community governance, and protection of land for future generations (Mansuy et al., 2023, p. 2; Nelson & Reed, 2025, p. 1-3).

Indigenous approaches to environmental management differ fundamentally from conventional Canadian and Western planning approaches because they do not separate ecological systems from cultural, spiritual, and social relationships. Indigenous knowledge systems (IKS) understand land and water as living relationships that carry reciprocal responsibilities among people, ecosystems, and future generations (Nelson & Reed, 2025). IKS and TEK extend beyond conventional interpretations of NbS by adopting a distinctly relational and biocultural worldview that rejects the artificial separation of nature and culture (Nelson & Reed, 2025, p. 2). Instead of emphasizing ecosystem services primarily in terms of human benefits, Indigenous approaches frame environmental stewardship as reciprocal relationships based upon respect, responsibility, and care for land and water. "Putting a price tag on these ecological processes can seem sacrilegious to some communities" (Nelson & Reed, 2025, p. 3). Consequently, in recent years, Indigenous communities across Canada have advanced Indigenous-led conservation and land management initiatives as mechanisms for protecting biodiversity, strengthening cultural continuity, advancing reconciliation, and exercising Indigenous self-determination through place-based knowledge systems developed over generational interactions with local ecosystems (Mansuy et al., 2023, p. 4-5; Vogel et al., p. 2).

These approaches align with EBM, NbS, and sustainable adaptive planning frameworks while simultaneously extending said frameworks through Indigenous epistemologies and ontologies (Nelson &

Reed, 2025, p. 6-8). Indigenous-led conservation initiatives emphasize holistic governance, long-term monitoring, collaborative decision making, and adaptive learning (Loucks & van Beek, 2017, p. 568) while recognizing that ecological and cultural resilience are inseparable. Approaches such as two-eyed seeing seek to integrate both IKS and TEK with Western science in ways that respect the strengths of each (Mansuy et al., 2023; Nelson & Reed, 2025). This principle is increasingly reflected within Indigenous-led conservation initiatives across Canada where environmental planning and governance is grounded with consideration of Indigenous laws, governance systems, and culture alongside Western scientific approaches to ecosystem management. (Mansuy et al., 2023, pp. 2–5).

One of the most significant developments in Indigenous environmental governance has been the emergence of Indigenous Protected and Conserved Areas (IPCAs). According to the Indigenous Circle of Experts, IPCAs are lands and waters where Indigenous governments have the primary role in protecting and conserving ecosystems through Indigenous laws, governance, and knowledge systems (Vogel et al., 2022). IPACs are characterized by three defining principles: Indigenous leadership, long-term commitments to conservation, and the recognition of Indigenous rights and responsibilities throughout governance processes (Vogel et al., 2022, p. 10). Beyond biodiversity conservation, IPCAs seek to revitalize Indigenous languages and cultures, strengthen conservation economies, protect culturally significant species, and apply holistic approaches to governance and planning that integrate ecological, cultural, and community objectives (Vogel et al., 2022, p. 10).

Within Ontario, Indigenous-led CLTs are an emerging application of these broader governance principles. The Temiskaming District Community Land Trust (TDCLT) represents how the CLT model can be adapted to Indigenous priorities while maintaining the principles of collective land ownership and long-term stewardship (Government of Canada, 2022). Developed through Keepers of the Circle with support from the Canada Mortgage and Housing Corporation's (CMHC) National Housing Strategy Demonstrations Initiative, the project seeks to establish an Indigenous women-led CLT serving the Districts of Temiskaming and Cochrane (Government of Canada, 2022). The proposed governance structure for the TDCLT prioritizes Indigenous women and gender-diverse peoples within key roles while embedding Indigenous governance practices throughout organizational decision-making (Government of Canada, 2022). The project explicitly adopts a two-eyed seeing approach to developing its governance policies, committees, bylaws, and decision-making structures, with a council providing cultural guidance to the board of directors (Government of Canada, 2022; Mansuy et al., 2023; Nelson & Reed, 2025). The TDCLT is also intended to support land reclamation, Indigenous ownership, self-determination and long-term community capacity for land stewardship across Northern Ontario (Government of Canada, 2022).

Emerging Indigenous urban land trust initiatives from beyond Ontario also highlight how CLTs can be specifically designed to address Indigenous cultural and planning concerns in urban areas. For

instance, the Calgary Urban Indigenous Community Land Trust Development Project presents a strategy developed in collaboration with Indigenous Elders and community partners to construct culturally appropriate affordable housing while promoting land-based relationships, community governance, and Indigenous autonomy (Government of Canada, 2022). The project's goal is to incorporate Indigenous cultural design, traditional meeting spaces, and community decision-making into long-term land ownership arrangements, with community consensus achieved through culturally appropriate processes like the Blackfoot Tea Dance ritual (Government of Canada, 2022). The resulting concept aims to promote access to affordable housing while also providing a transportable framework for Indigenous-led CLTs across Canada (Government of Canada, 2022).

Recent initiatives in Ontario demonstrate that Indigenous-led land governance include broader goals such as ecological restoration, land stewardship, and cultural revitalization. For instance, Crow Shield Lodge, and Indigenous-based land organization received its first parcel of land in Guelph in 2026, when another local non-profit organization returned the site to Indigenous stewardship (Record News, 2026). The organization framed the acquisition as an opportunity to protect lands for future generations while also promoting land-based education, healing, and Indigenous cultural relationships (Record News, 2026). These efforts demonstrate how Indigenous land organizations can integrate conservation, community well-being, and land reclamation into urban and peri-urban contexts (Record News, 2026).

Together, these initiatives highlight the progress that newly emerging Indigenous-led land trusts and IPACs are making toward integrated models of environmental planning that incorporate land stewardship, Indigenous governance, cultural renewal, biodiversity conservation, and climate resilience. While these governance models differ significantly from the urban and peri-urban CLTs investigated earlier in this research, they share key characteristics such as collective stewardship, long-term land tenure, participatory governance, and commitments to protecting land from speculative development. These shared principles serve as the foundation for the discussion that follows, comparing urban and peri-urban models against Indigenous ones through EBM, NbS, and adaptive management frameworks, while also acknowledging their distinct geographical, ecological, institutional, and socio-political contexts.

5.4 - Urban and Peri-urban/Exurbian vs. Indigenous Models

With the thorough examination of the PNLT, MCLT, and emerging the newly emerging Indigenous typology, important distinctions are highlighted in how each model approaches watershed stewardship, flood mitigation, ecological resilience, and climate resilience. Each model employs distinct governance arrangements that influence how environmental objectives are prioritized and implemented that represents the range of CLT typologies in Ontario and the unique history of CLTs in Canada in general. Urban CLTs primarily respond to challenges associated with housing affordability, displacement, and climate adaptation within highly developed environments. Peri-urban and exurban CLTs operate in

regions with a mix of smaller urban centers located within landscapes of greater ecological connectivity, therefore placing a stronger emphasis on balancing community development with long-term environmental stewardship. Indigenous-led land trusts and protected areas differ further by situating environmental governance within Indigenous frameworks of cultural relationships with land and water as well as responsibilities toward future generations.

Environmental planning objectives also broaden across these differing governance contexts. In the urban setting, planning priorities are largely focused on mitigating the environmental consequences of urbanization while simultaneously protecting affordable housing and strengthening community resilience (Yoon et al, 2022). In peri-urban and exurban settings, planning aims to incorporate watershed and forest protections, climate adaptation, and sustainable land management as interconnected planning objectives (Kargwal et al., 2025). Indigenous-led governance expands these objectives further by recognizing environmental stewardship as inseparable from Indigenous governance, cultural revitalization, and their rights and responsibilities (Nelson & Reed, 2025). Environmental planning in Ontario therefore encompasses everything from mitigating urban pressures to managing entire ecological systems to incorporating Indigenous governance and practices through integrated and place-based governance approaches (Ministry of Municipal Affairs and Housing, 2024)

Another important distinction concerns governance authority. The PNLT and MCLT operate primarily within existing provincial and municipal planning systems through partnerships with municipalities, academic institutions, NGOs, conservation authorities, and other community stakeholders. The PNLTs and MCLTs governance structures seek to complement existing planning institutions rather than modify them (Yoon et al, 2022; Kargwal et al., 2025). On the other hand, emerging Indigenous-led CLTs and protected areas increasingly challenge conventional planning arrangements by asserting Indigenous principles and practices of land and water management and integrating Indigenous legal traditions, knowledge systems, and responsibilities into environmental governance (Nelson & Reed, 2025). This positions Indigenous communities as the primary decision-makers responsible for environmental stewardship (Nelson & Reed, 2025).

This comparison further illustrates the differing relationships with EBM, NbS, and adaptive management frameworks. While all three governance models incorporate these frameworks to varying degrees, they do so through different pathways. These distinctions between the different models are summarized in Table 3. The table format was developed with insights from Table 1 in the paper titled Citizen Science and Greenspace Planning in the
Rouge River Watershed by Macaraig (2014). The framework presented here classifies governance approaches according to their dominant planning characteristics, highlighting that while all three governance models pursue long-term stewardship and community participation, they differ in planning

objectives, governance authority, environmental priorities, and relationships with existing planning institutions.

Table 3

Comparative Typology of CLT Models in Ontario

Planning Dimension	Urban Community Land Trust (PNLT)	Peri-urban/Exurban Community Land Trust (MCLT)	Emerging Indigenous-led CLTs and protected areas
Primary planning challenge	Housing affordability, displacement, environmental justice, climate resilience	Housing shortages, seasonal development pressures, ecosystem conservation	Indigenous sovereignty, land restitution, ecological stewardship, cultural revitalization
Dominant geographic setting	High-density urban neighborhoods	Rural, peri-urban and exurban landscapes	Traditional territories, protected areas, urban Indigenous lands
Governance structure	Community board operating through partnerships with municipalities and non-profit organizations	Community-based governance with municipal, environmental and regional partnerships	Indigenous governments and community-led decision-making grounded in Indigenous governance systems
Primary environmental planning objective	Integrating affordable housing with urban environmental sustainability	Balancing community development with long-term landscape and watershed conservation	Restoring Indigenous stewardship while protecting ecological and cultural systems
Relationship with Ecosystem-Based Management (EBM)	Urban ecosystem stewardship and neighborhood resilience	Landscape-scale ecosystem management integrating forests, lakes and watersheds	Holistic ecosystem stewardship integrating ecological, cultural and governance objectives
Application of Nature-based Solutions (NbS)	Urban greening, tree canopy expansion, stormwater management, community gardens	Forest conservation, wetland protection, watershed restoration, low-impact development	Ecological restoration, land-based stewardship, Indigenous conservation practices

Adaptive planning approach	Community partnerships and neighborhood-level adaptive planning	Flexible management responding to ecological and demographic change	Adaptive stewardship informed by Indigenous knowledge, intergenerational responsibility and place-based learning
Water-related planning emphasis	Stormwater management and urban watershed health	Watershed protection, groundwater, lake management and riparian conservation	Watershed stewardship as part of territorial governance and ecological relationships
Knowledge systems informing planning	Scientific research, municipal planning, community participation	Scientific research is integrated with local environmental knowledge	Indigenous knowledge systems alongside Western science and collaborative planning
Relationship with government	Operates within existing municipal planning frameworks	Collaborative governance with municipalities and regional organizations	Increasing emphasis on Indigenous jurisdiction while interacting with provincial and federal institutions
Principal planning contribution	Demonstrates how affordable housing can support urban environmental resilience	Demonstrates integration of community development and ecosystem stewardship	Reframes environmental planning through Indigenous governance, stewardship and reconciliation
Major implementation challenge	Limited land availability and dependence on municipal partnerships	Funding limitations, organizational capacity and dispersed settlements	Jurisdictional complexity, legal recognition and power-sharing between Indigenous governments and the Crown

5.5 - Implications for Planning Policy and Practice

The comparative analysis demonstrates that Ontario's CLT typologies are highly variable that are shaped by the unique geographical, ecological, institutional, and socio-political contexts across the province. Urban CLTs highlight how environmental planning can strengthen neighborhood resilience

while simultaneously addressing housing affordability, displacement, and environmental justice. Peri-urban and exurban CLTs highlight how community governance can integrate affordable housing with expanded objectives related to watershed protection, climate resilience, sustainable development, and ecosystem stewardship. Emerging Indigenous-led land governance models expand these approaches further by centering Indigenous principles and practices, TEK, and long-term stewardship responsibilities within environmental planning and conservation initiatives.

These findings have several important implications for environmental planning practice in Ontario. First, they suggest that CLTs should be understood as more than affordable housing organizations. Ontario CLTs are increasingly capable of contributing to watershed stewardship, flood mitigation, ecological resilience, and climate resilience. These findings are consistent with EBM frameworks, which emphasize integrating ecological, social, and governance considerations into planning processes (McAfee & Malouin, 2008). They are also consistent with adaptive planning approaches that recognize the value of collaborative governance, iterative learning, and long-term stewardship (Kaplan-Hallam & Bennett, 2017). Similarly, the environmental initiatives carried out by the PNLT and MCLT demonstrate how community-led governance can operationalize NbS through place-based planning strategies that respond to ecological conditions and community priorities (Turner et al., 2022).

This research highlights the importance of planning at multiple spatial scales. The comparative analysis illustrates that environmental planning priorities vary considerably according to geographic, ecological, institutional, and socio-political contexts. Urban CLTs primarily engage with neighborhood-scale issues such as green infrastructure, urban forestry, heat mitigation, and stormwater management (Yoon et al., 2022; Sustainability Solutions Group, 2025), while peri-urban and exurban organizations address landscape-scale concerns including watershed protection, forest conservation, shoreline management, and sustainable development (Kargwal et al., 2025). Indigenous-led governance models broaden this perspective further by adopting holistic approaches that recognize entire watersheds, ecosystems, and traditional territories as interconnected planning units (Vogel et al., 2022). These findings reinforce the importance of place-based environmental planning and demonstrate that effective governance requires planning frameworks capable of responding to the ecological characteristics of entire landscapes rather than relying on standardized approaches (Loucks & van Beek, 2017).

Finally, the comparison demonstrates an important shift in environmental governance from predominantly top-down and state-centered management toward increasingly collaborative and community-based approaches (Loucks & van Beek, 2017, p. 34). Each model demonstrates how local communities contribute meaningfully to planning through stewardship, participation, and adaptive management. While municipalities, conservation authorities, and provincial agencies continue to play central roles in Ontario's planning system, CLTs and Indigenous-led organizations increasingly serve as

complementary governance actors capable of strengthening local environmental capacity, improving ecological resilience, and supporting collaborative decision-making. These findings support broader calls within environmental planning literature for more participatory, adaptive, and ecosystem-based governance arrangements that integrate local knowledge, community stewardship, and cross-sector partnerships into planning practice (Hodge et al., 2020; Calder & Beckie, 2012; Loucks & van Beek, 2017). Municipalities, conservation authorities, and provincial agencies should explore opportunities to formally incorporate CLTs and Indigenous organizations into watershed stewardship, flood mitigation, ecological resilience, and climate resilience initiatives across Ontario.

5.6 - Limitations

Several limitations should be acknowledged in relation to the scope, methodology, and data sources used in this research. First, this study relied primarily on document analysis and publicly available data as compared to primary data collection methods. As a result, the research was limited to information that has been publicly documented or produced by CLTs, municipalities, conservation authorities, and other organizations. These sources may not have fully captured internal decision-making processes, informal governance dynamics, or differing stakeholder perspectives. A second limitation related to the availability and consistency of data across cases. The selected CLTs varied in organizational scale, institutional capacity, and public visibility, resulting in uneven levels of publicly accessible information. For instance, the PNLT, a larger and more established CLT, produces more extensive reports and studies, has a larger media coverage, and planning documentation. This variation influenced the depth of analysis possible for each case and created challenges in maintaining consistent comparison across all analytical categories.

Although this research incorporated spatial data to provide geographical and ecological context, it did not undertake original spatial analysis. Instead, this research relied on secondary spatial datasets and publicly available maps produced by municipalities, conservation authorities, provincial agencies, and environmental organizations to characterize environmental conditions surrounding each case study, including flood vulnerability, vegetation cover, watershed boundaries, and proximity to watercourses. While these datasets strengthened the contextual understanding of the environmental settings in which the CLTs operate, they were interpreted descriptively rather than analyzed quantitatively. Consequently, the research was limited in its ability to measure or model the direct environmental impacts of CLT activities.

Future research could strengthen the analysis by incorporating original spatial analysis to evaluate the environmental contributions of CLTs more directly. For example, high-resolution spatial datasets could be used to quantify changes in tree canopy cover, impervious surface area, proximity to wetlands and watercourses, flood exposure, and green infrastructure surrounding CLT properties. Network and landscape analyses could further examine ecological connectivity, habitat fragmentation, and

relationships between CLT developments and watershed characteristics. Such analyses would provide a more rigorous spatial assessment of how CLTs can contribute to watershed stewardship, flood mitigation, ecological resilience, and climate resilience across differing contexts.

6. Conclusion

This research examined how CLTs in Ontario can contribute to environmental planning through a comparative case study of the PNLT and MCLT. Using EBM, NbS, and sustainable adaptive planning frameworks, this research evaluated how each organization contributes to watershed stewardship, flood mitigation, ecological resilience, and climate resilience within distinct urban and peri-urban contexts. The findings demonstrate that both organizations increasingly integrate environmental stewardship, climate adaptation, and long-term land management into their mandates and practices. One of the principal contributions of this research is the demonstration that CLTs can extend beyond their traditional housing mandate to support broader environmental planning objectives. By bringing together concepts from affordable housing, community land governance, and environmental planning, this study provides one of the first comparative examinations of how Ontario CLTs can contribute to water and environmental planning through place-based stewardship and collaborative governance. The findings have important implications for environmental planning policy and practice in Ontario. They suggest that CLTs should be recognized as partners in watershed planning, climate adaptation, biodiversity conservation, and community resilience alongside municipalities, conservation authorities, Indigenous communities, and other environmental organizations. This would enhance the capacity of CLTs to support sustainable, community-led environmental planning while maintaining their core commitment to permanently affordable housing. Although this research is limited to two Ontario case studies, document analysis, and publicly available secondary data, it provides an important foundation for understanding the evolving role of CLTs within environmental planning and highlights several opportunities for future research. Future studies could incorporate additional case studies from across Canada and apply original spatial analysis to evaluate the environmental impacts of CLT initiatives on watershed health, ecological connectivity, and climate resilience. Collectively, such research would strengthen understanding of how CLTs can contribute to more integrated, adaptive, and place-based environmental and water planning in Ontario and beyond.

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