Unlocking Community Adaptive Capacity:

Navigating Systemic Barriers, Drivers and Enablers in Climate Adaptation

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Catamount Fellowship, Institute of Community Prosperity

Land Acknowledgement

I would like to take a moment to honour with gratitude and respect the land that we occupy and call our home. Indigenous Peoples have been gathering in the City of Calgary for thousands of years, sharing their knowledge and storytelling amongst their generations. It is important that we acknowledge the Treaty 7 signatories which include the Siksika Nation, Piikani Nation, Kainai Nation, the Îethka Stoney Nakoda Nation, consisting of the Chiniki, Bearspaw, and Good Stoney, with the bands and people of the Tsuut'ina Nation. Calgary is also home to the Métis Government and to the Métis Nation of Alberta, Region 5 & 6. I recognize that I am a settler who lives, works, and grows on this land comprising the Wîcîspa, Guts'ists'i and Moh'kinstsis communities, the traditional names that we now know as Calgary. In honour of reciprocity and respect, I would like to address Calgary as a place where everyone can come together and engage in reconciliation. Moreover, I am truly grateful for having the opportunity to receive Indigenous teachings from Elder Clarence Wolfleg and Dion Simon; these connections have been enlightening and memorable.

Recognition and Appreciation

Catamount Fellowship

I would like to sincerely say thank you to Barb Rallison, Cordelia Snowdon-Lawley and James Stauch from the Institute for Community Prosperity at Mount Royal University for graciously supporting me throughout my eight-month journey in the Catamount Fellowship. Your team has given me the opportunity to learn and grow as an individual, while also providing me with many tools to become a systems thinker.

Secondly, thank you to all of the fellows who have embarked on this journey with me. It has made the experience more enjoyable and I am very grateful for the friendships that I have developed.

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Additional

I would like to extend my gratitude to Brian Jackson at the Mount Royal University Library for assisting me with my research in the fellowship, along with Ashley Dion from the Institute for Community Prosperity for taking time out of her busy schedule to teach our cohort about mapping tools and how to tackle complex problems.

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Foreword

The purpose of this study was to explore the systemic barriers, drivers, and enablers to increase the adaptive capacity of communities in the face of climate change. Moreover, this study was conducted to identify the specific gaps within the system in partnership with the team lead for the City of Calgary's Climate and Environment Business Unit and a faculty mentor in the Bissett School of Business at Mount Royal University.

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Contents

Introduction

The Fellowship

The Catamount Fellowship is an eight month cohort-based learning experience that allows students to explore wicked "how might we" questions, alongside their faculty mentor and community partner. This program consists of two components: transformational learning and research in collaboration with the community. It provides students the opportunity to investigate the underlying causes of ecological, social, economic, and cultural concerns that the community has highlighted by delving into social innovation frameworks, experiential learning, and in-depth community listening. Therefore, for the duration of the fellowship my group has been researching the question, "How might we identify and address the systemic barriers, drivers, and enablers to increase the adaptive capacity of communities in the face of climate change?"

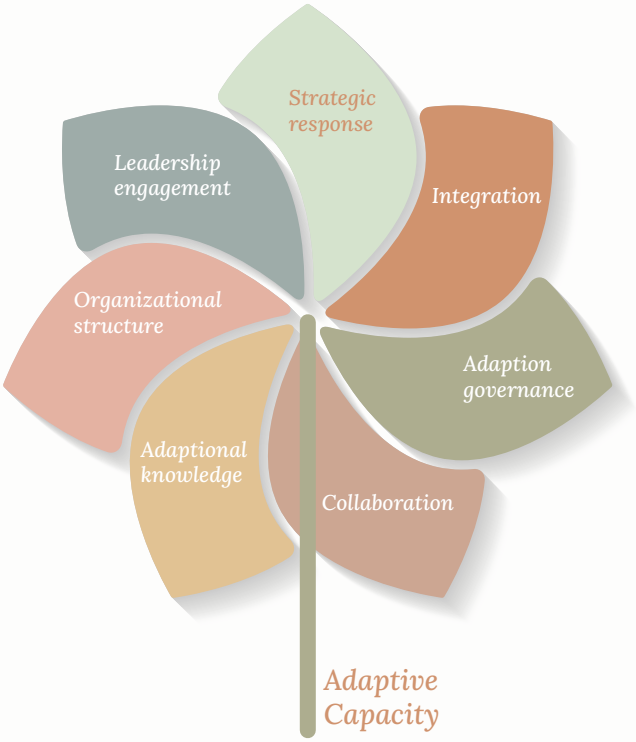
Climate Change

Climate change refers to the long-term shifts in temperature and weather patterns on a local, regional and global scale. Recognizing the impacts climate change can have on individuals, it is important that communities are building resilience in the face of these shifts. The term "climate change adaptation" describes measures taken to lessen vulnerability to the effects of climate change, whether now or in the future, such as extreme weather events, rising sea levels, loss of biodiversity, and insecurity of food and water (United Nations [UN], 2024). Therefore, it is important that adaptation measures occur at a local level to ensure that communities are prepared and can manage their needs accordingly (UN, 2024).

Social learning is a concept that allows individuals to learn from others through observation, social interaction and mimicking other behaviors (Boyd & Ratliff, 2023). Despite our understanding of the importance of social learning in enhancing adaptive capacity, there remains a limited grasp of the complex interplay between social learning, adaptive capacity, and climate change adaptation. Bullock et al (2022) emphasized the urgency of comprehending how adaptive capacity and social learning contribute to sustainability, particularly in addressing climate change as a significant social-ecological challenge. In recognition of this, humans are now fostering gradual transformative changes through various approaches, which include adaptation strategies, environmental resource management, and policy interventions (Bullock et al., 2022). In addition, these adjustments have revealed that communities with high adaptive capacity facilitate resilience building adaptations, while those with low capacity exacerbate vulnerability and crisis.

Adaptive Capacity

Adaptive capacity describes how a system can alter and adapt itself to the impacts of climate change (Climate Adapt, n.d.). It encompasses strategic response, organizational culture, collaboration, integration, adaptation governance, leadership engagement, and adaptational knowledge (How Well Are We Adapting, n.d.). It is critical for a system to possess high adaptive capacity to reduce vulnerability, and to ensure that the system can reconfigure itself in order to guarantee that there is minimum loss of function. For example, adaptive capacity of agriculture pertains to the capability of farming systems to effectively address a range of challenges, including climate change, biodiversity loss, and food insecurity. Therefore, farming communities implement diversification of drought-tolerant and flood-resistant crops to ensure that they are able to withstand extreme weather events while also ensuring food production.



Three Climate Risks:

1. **Hazards:** Some examples of hazards are loss of life, loss to property, droughts, heatwaves and heavy rain events and storms (Climate Adapt, n.d.).
2. **Exposure:** Describes the presence of people, livelihoods, environmental functions, social, and cultural assets in places and settings (Climate Adapt, n.d.).
3. **Vulnerability:** A variety of concepts and elements including sensitivity to harm and lack of capacity to cope and adapt (Climate Adapt, n.d.)

In an effort to implement adaptive capacity measures, municipalities need to identify climate risks and seek ways to mitigate risks within an area. There are three different factors that describe climate risk and they are listed as hazards, exposure, and vulnerability (Climate Adapt, n.d.).

Furthermore, risk assessments are identified by employing local knowledge and obtained data, and through this process frameworks can be implemented to help communities fight climate change. Therefore, by making these appropriate adaptations within the community, individuals will be prepared for sudden challenges.

With these climate risks, it is important to understand that human societies, ecosystems and climate change are all affected and interact with each other. This is shown in Figure 1, where *wheel A* describes the main interactions and trends with the risks that are associated between the three systems. While *wheel B* demonstrates how to decrease climate change risks and build resilience in communities.

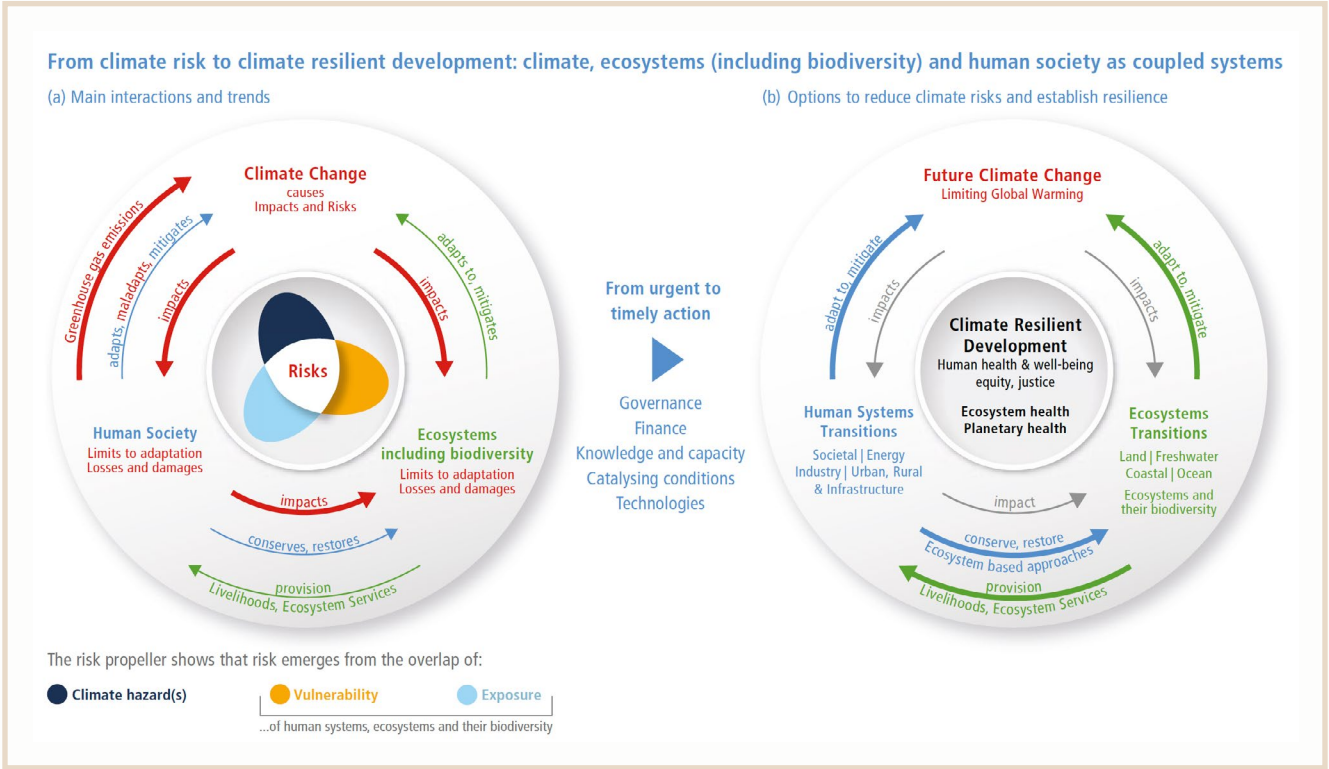
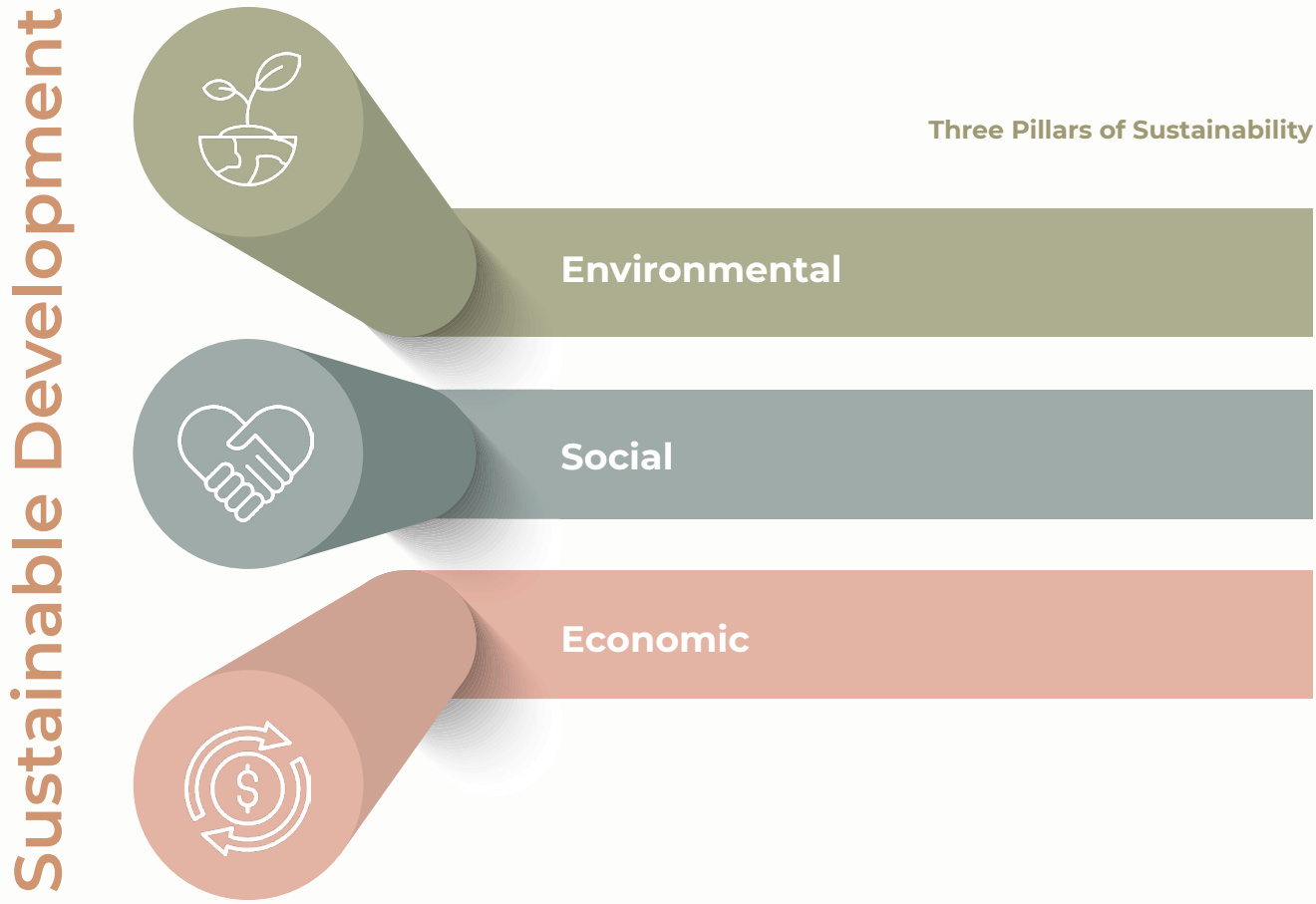


Figure 1: From climate risk to climate resilient development: climate, ecosystems (including biodiversity) and human society as coupled systems (Intergovernmental Panel on Climate Change [IPCC], 2022).



Sustainable Development Goals

The United Nations (UN) approved the Sustainable Development Goals (SDGs) in 2015 as a global call to action to end poverty, safeguard the environment, and guarantee that by 2030 all people will be living in peace and prosperity (United Nations [UN], n.d.). In order to accomplish these goals, the seventeen SDGs were created to aid in developing a balance between environmental, social, and economic sustainability; known as the three pillars of sustainability (UN, n.d.). As all seventeen goals overlap between the three pillars, there is an emphasis on societal targets and social development. The social pillar of sustainability is crucial because it emphasizes the importance of promoting social inclusion to enable socio-economic development and empowerment to build resilient societies.

By working towards these SDGs through the social pillar, the environmental and economic pillars are also enhanced. This ensures that there are resilient communities around the world with high adaptive capacity, active sustainable practices creating healthier, safer, and more productive environments for future generations. For instance, SDG Goal 4 (Quality Education) can help communities attain inclusive and equitable education to promote lifelong learning opportunities (UN, n.d.). This can directly affect an individual's increased awareness of their surrounding environment, and through learning opportunities people are more inclined to adjust their lifestyles to ensure that they protect their living environment.

Economy, Society, Environment

The first attempt by Western society to link environmental stability and economic development was made in the 1987 Brundtland Commission Report, "Our Common Future," which laid the foundation for the idea of sustainable development (Surampalli, 2020). As sustainable development is a multifaceted concept, it contains three main ideas of economy, society and environment which incorporates "futurity, interdisciplinarity, participation, learning and adaptation for the development of socio-cultural, socio-economical and natural environments, which are crucial for the wellbeing of the human race and of nature" (Surampalli, 2020, p. 4).

> *"Change is never easy, and it often creates discord, but when people come together for the good of humanity and the Earth, we can accomplish great things."*
>
> – David Suzuki, 2024

With these three pillars as the foundation of sustainability, the adaptation and resiliency of all living beings would be heightened if practiced and this could result in a holistic sense of self within the greater context of which humanity exists. By possessing these foundations, it enables community members to understand how complex these frameworks are and how they can be managed. They are able to ask themselves, "what should be sustained?" and "what can be sustained?" and assess the situation with the proper protocols (Surampalli, 2020).

Presently, humanity is heavily dependent on the economy, and therefore it dominates the environmental and societal pillars of sustainability (Giddings et al., 2002). This can be considered problematic because a hyper-focused mindset of attaining economic growth can lead to more inequality in wealth, power, and education, causing societies to be less concentrated on environmental and societal issues (Giddings et al., 2002). Additionally, with the ideology of individualism being highly implemented in capitalistic communities, it can hinder someone's sense of belonging and singularity becomes highly valued. So, in the face of climate change, societies need to unify and work together to aid each other to ensure a comprehensive idea of what resilience and adaptive capacity resembles to them. By protecting the environment and becoming stewards of the land, communities are able to have greater knowledge of how the environment changes during climatic events, and as a result, they are able to adapt with the changes.

As seen in Figure 2, the *Nested Sustainable Development* Model shows how the economy is dependent on society, and how society is dependent on the environment (Giddings et al., 2002). However in order for communities to increase their adaptive capacity, it's imperative that we challenge our ways of thinking and doing. If we switch our mindset using the figure, we can see how the environment surrounds both society and economy. The reason for this is because our survival as human species is reliant on the natural environment, while the economy is a human construct that can be adapted to better serve the planetary constraints. So, by communicating and educating communities about the importance of the environment, societies would likely become more engaged with the natural world and they would want to preserve it to ensure their survivability. However, it is also worth validating how difficult it is to modify our perspectives. But, to help with this, community-based natural resource management (CBNRM) gives people the opportunity to practice and treat the physical environment as part of the community (World Neighbors, 2022). Some key elements of this approach include:

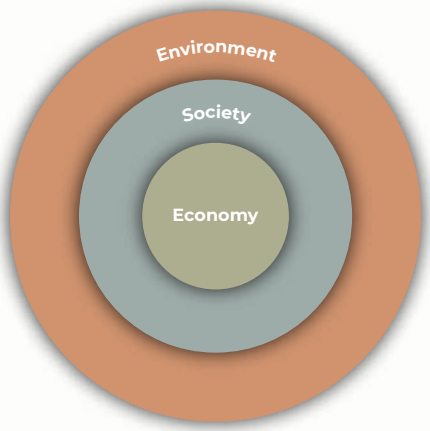


Figure 2: The *Nested Sustainable Development* Model (Giddings et al., 2002).

- Multi-stakeholder collaboration that involves community members, organizations and government in participatory action,
- Conflict management mechanisms,
- Environmental services that improve community livelihood,
- Policy support, and
- Collaborative management to build strong decision-making amongst all stakeholders (World Neighbors, 2022).

What is Calgary Doing?

The City of Calgary's mitigation plan is taking action to reduce and prevent greenhouse gas emissions with the help of natural or technological means (City of Calgary, 2022a). Some of the mitigation plan encompasses the themes of implementing more renewable energy and carbon negative technologies, retrofitting existing buildings to new standards of net zero emissions, and focusing on land use planning to prioritize zero emissions (City of Calgary, 2022a). In addition, the City of Calgary's adaptation plan coincides with the mitigation plan to create a more climate-resilient city with the four themes: people, built infrastructure, natural infrastructure and water (City of Calgary, 2022a).

Climate Atlas of Canada (2019) stated, "Climate change is a challenge that requires us to work together, locally, nationally, and globally. With technical know-how, political will, targeted investments, and collective commitment, we can mitigate the severity of climate change and build resilience to its impacts" (p.1). Without adaptive capacity in societies, climate change can impact health, influence extreme weather, and affect infrastructures.

Firstly, the prolonged exposure to high temperatures can be very dangerous for the elderly and the chronically ill, especially for those who are living in a building with no air conditioning (Climate Atlas of Canada, 2019). Moreover, high heat can negatively influence air quality, harbor the spread of disease, and cause stress and anxiety; affecting an individual's mental health (Climate Atlas of Canada, 2019).

Secondly, the likelihood of more extreme weather events, such as strong winds, flash floods, hail, lightning, tornadoes, droughts and wildfires, may rise with a warmer environment (Climate Atlas of Canada, 2019). Thirdly as some infrastructures were not built to withstand climate change, the integrity of buildings, roads, bridges can be all compromised. Therefore, emergency preparedness planning alongside sustainable urban planning are significant aspects to consider when increasing adaptive capacity (Climate Atlas of Canada, 2019).

Climatic Events in Calgary

Calgary has been exposed to many major climatic events that have affected surrounding communities. One instance of this was the biggest flood Calgary had experienced since 1932 (Shevchenko, 2020). In June 2013, severe precipitation caused it to rained heavily for two days straight in Calgary, causing the city to experience a large-scale flood. As a result, more than one hundred thousand Albertans were evacuated; this was one of the largest evacuations in Canadian history for more than sixty years (Shevchenko, 2020). The consequences of this flood resulted in over one hundred kilometers of riverbank walkways being submerged under water, mud, and debris (Shevchenko, 2020). Additionally, it was stated that thirty four thousand locations were without power, four thousand businesses were impacted, while thirty thousand sandbags were laid by hand (City of Calgary, 2022b).

At the end of the 2013 flood, Canada had faced one of its more expensive natural disasters, with damages totaling almost five billion dollars across southern Alberta (City of Calgary, 2022b). Following the flood, the City of Calgary regulated new development in flood hazard zones, prohibiting new buildings or structures from being built in a floodway (Shevchenko, 2020).

Since the flood of 2013, the City of Calgary and the Government of Alberta invested one hundred and fifty million dollars in flood mitigation and resilience programs, to help avoid similar disasters in the future (City of Calgary, n.d.). An example of this is shown in Figure 3, the Flood Resilience Plan in Action, where the City of Calgary shows a holistic overview of how to improve resilience towards extreme climate events. Calgary's Flood Resilience Plan is structured to implement a three-layered approach of upstream flood protection, community-level flood protection and property-level flood protection (City of Calgary, n.d.). This program was imperative because it has helped increase the adaptive capacity of surrounding communities by educating the public about river and flood conditions, and by modernizing floodplain land use policies (City of Calgary, n.d.). In addition, with the help of flood mitigation projects in Calgary along with the resilience plan, flood risk has been reduced overall by fifty per cent (City of Calgary, n.d.).

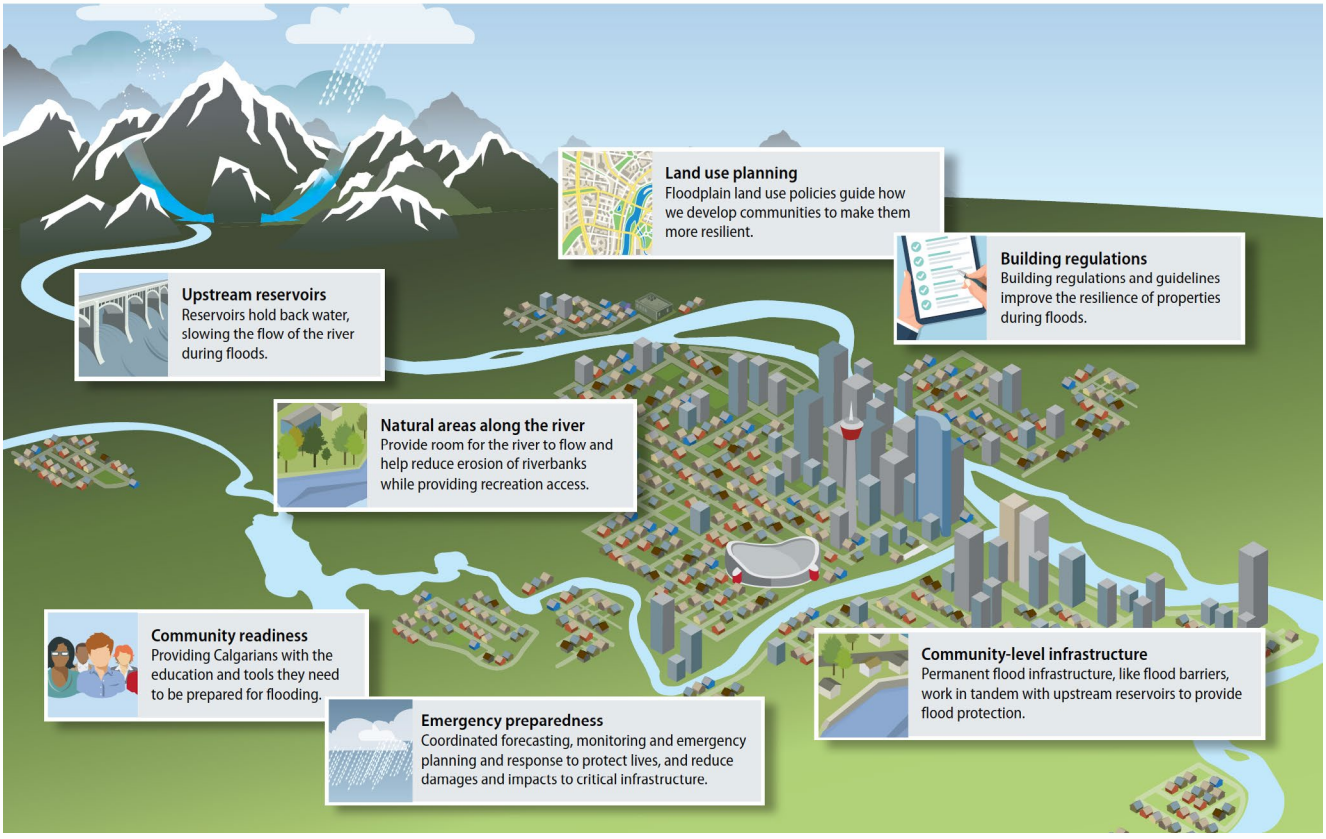


Figure 3: *Flood Resilience Plan in Action* (City of Calgary, 2022c).

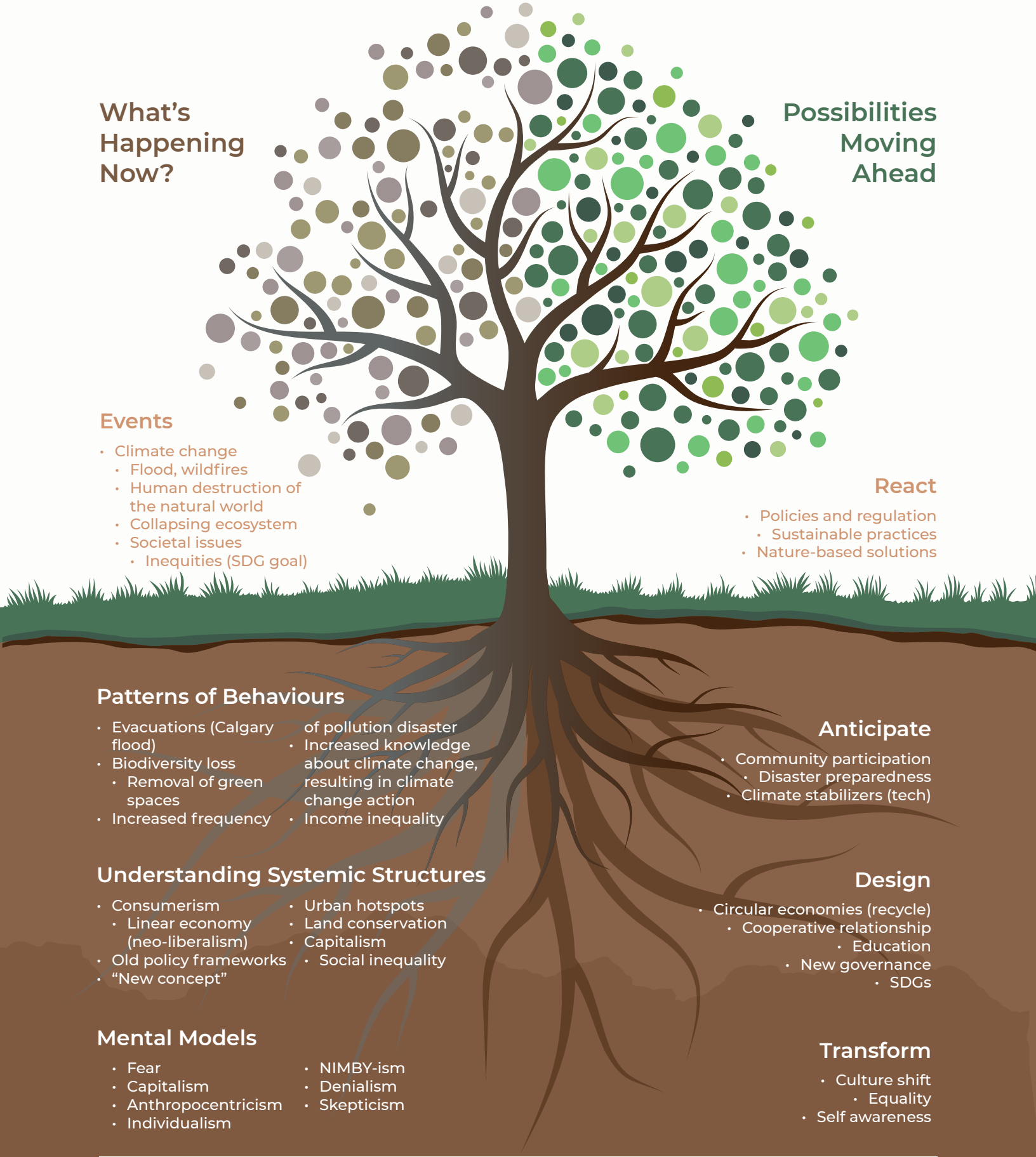
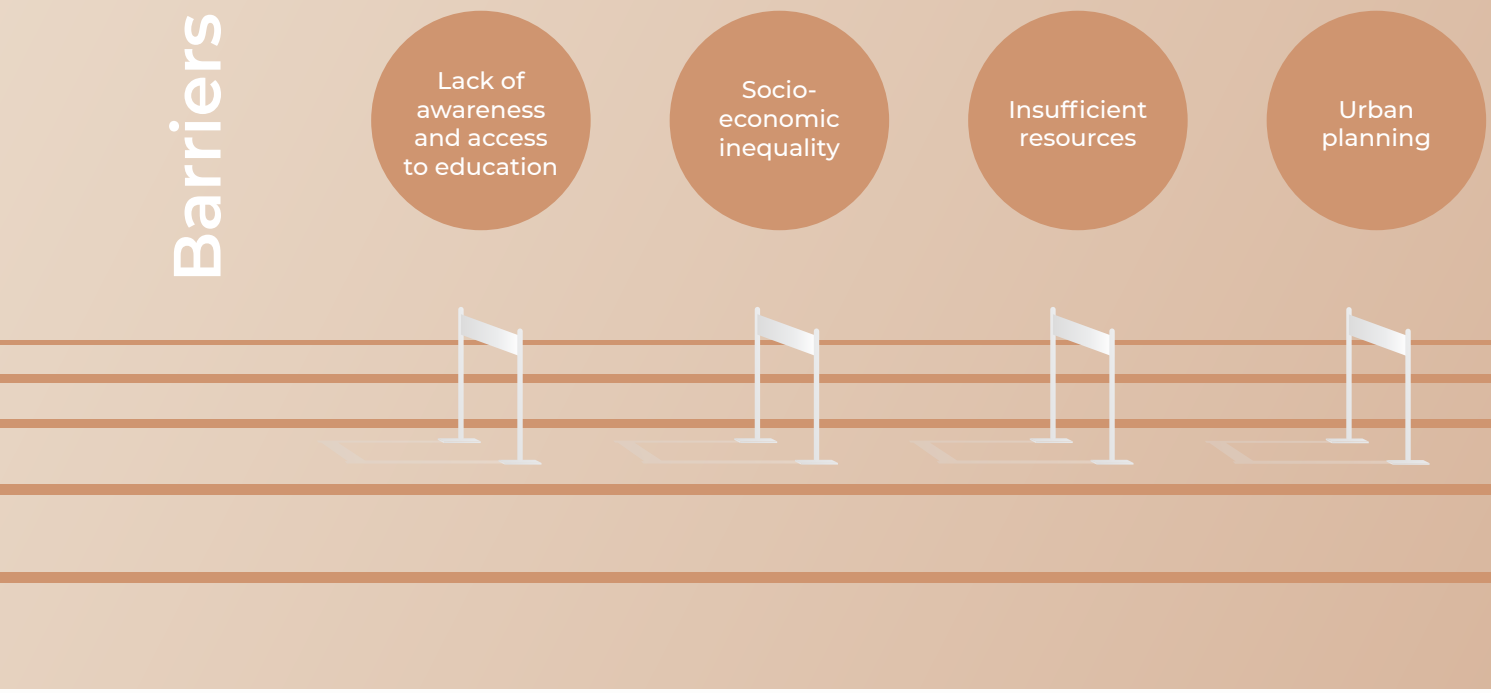


Figure 4: *A Tree Model Representing the Various Layers of Climate Change Adaptation.* Adapted from the "Systems Change Tree" (Andres et al., 2023 as cited in Andres, 2024).



There are a number of barriers to developing adaptive capacity that can pose different types of challenges or constraints impeding or halting adaptations to climate change. Figure 4 above is an interpretation of the barriers in this system based on the model adapted by Andres, Muriithi, and Elder Greene (2024) called the "Systems Change Tree." The tree template captures the interconnectedness and the various relationships that are inherently threaded throughout complex systems, representing the visual changes we see, along with the hidden structures and mindsets that are buried below the surface.

Some community level barriers would encompass lack of awareness and access to education, socio-economic inequality, insufficient resources, and urban planning. Lack of awareness and education may result in insufficient access to climate data, hindering informed decision-making. Hence, providing accessible environmental education to all communities is crucial for fostering informed discussions on the subject. Additionally socio-economic inequalities pose another significant barrier. Communities facing such disparities often lack the resources necessary for effective adaptation, making them more vulnerable to climate crises. Consequently, widespread availability of financial services, education, and resources is essential for communities combating climate change, as it ensures a more sustainable and resilient future.

Urban planning is another barrier to consider. Large cities and urban areas are built on the foundation of large masses of concrete, metal, asphalt and glass, which results in the destruction and deterioration of the natural environment. This creates an 'urban heat island' where urban city forms and

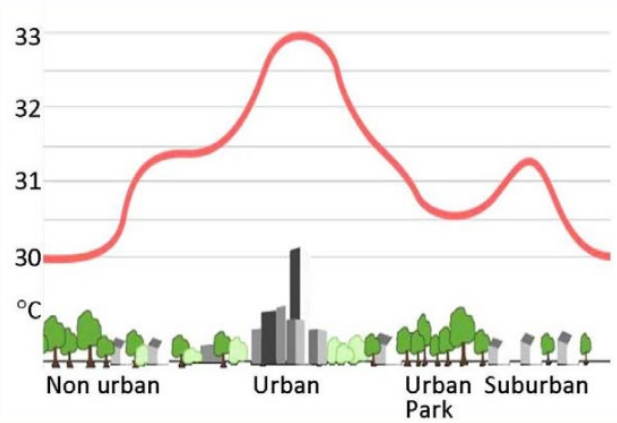


Figure 5: *Schematic View Of The Urban Heat Island Effect* (Forkes & Penny, 2010).

building materials alter the behaviour of solar energy in the urban environment (Forkes & Penny, 2010). For instance, vegetation intercepts and reduces solar energy, but with limited amounts of greenery in urban areas, there is increased absorption of solar energy resulting in higher temperatures (Forkes & Penny, 2010). Moreover, green areas allow the ability for rainwater absorption to reduce flooding, provide natural shade, and supply local agricultural services. So, by creating a space that supports inclusive planning, green spaces, and resilient infrastructures, cities can improve the health and well-being for all. This is shown in Figure 5, where the rural communities that are surrounded by their natural environment have lower temperatures, compared to the busy urban areas that show high levels in temperature (Forkes & Penny, 2010).

By addressing the various barriers that were highlighted within the system, it is important that we recognize programs and actions that are being implemented in our communities to address the adaptive capacity measures needed to combat climate change.

Financial

As communities enhance their adaptive capacity, planned actions also involve financial backing in policymaking, disaster risk financing frameworks, and resilient infrastructure (World Economic Forum, 2023). Financial structures play a pivotal role in supporting community members that might not have the financial resources to become more adaptive to climate changes. To assist with this, Canada in 2021 announced that $1.6 billion in new federal funding would help protect communities while also providing the public infrastructures to withstand climatic events that are surging across the country (Government of Canada, 2022). This strategy described five key areas that would be implemented including improving health and well-being of communities, protecting and restoring nature and biodiversity and reducing the impacts of climate-related disasters (Government of Canada, 2022, para 4).

Indigenous Knowledge

Sustainable development can be informed by Indigenous People's traditional knowledge and practices into modern sustainable adaptive measures. Indigenous Peoples have long been known for their sustainable lifestyles, which can help us to protect our ecosystems and reduce our negative impacts on the environment (Sustainability For all, 2019). For instance, an example of how Indigenous Peoples approach the environment is through a circular fashion using the Indigenous medicine wheel (Figure 6).

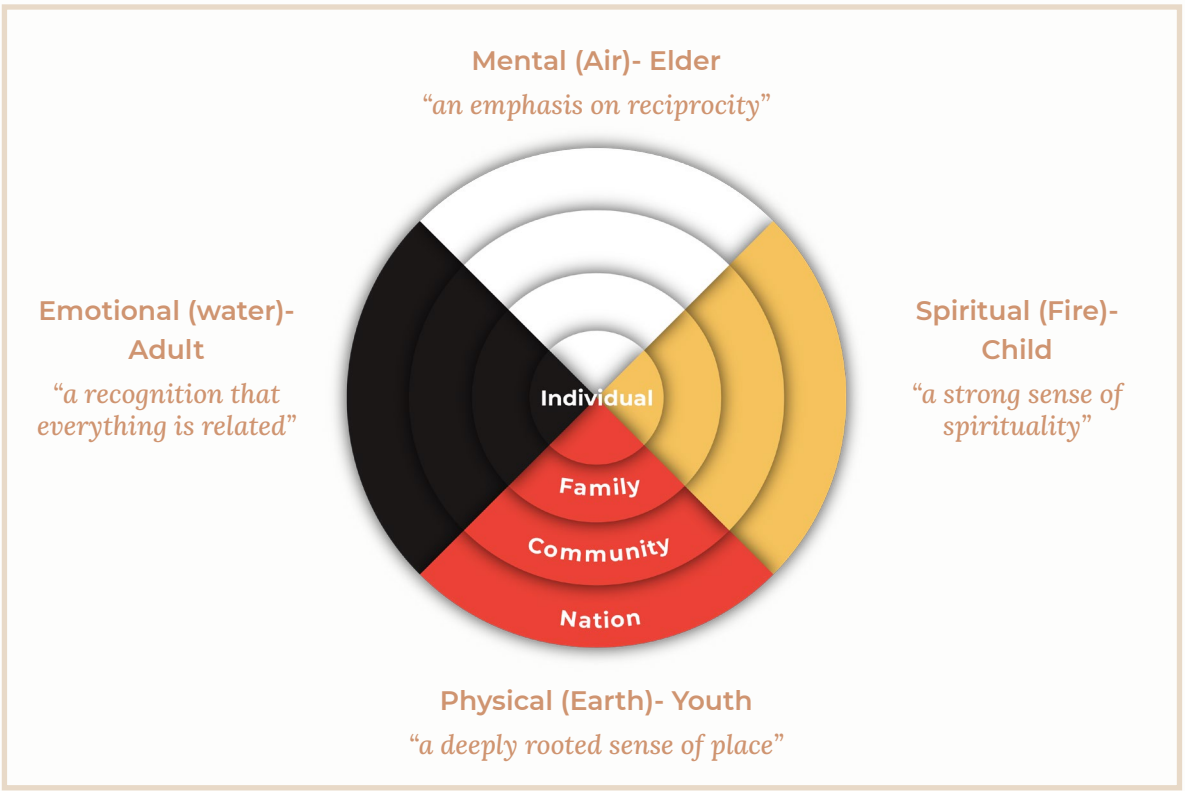


Figure 6: The *nehiyawak* medicine wheel (Lamouche, 2023).

The Indigenous medicine wheel is described as influencing how Indigenous Peoples view the world. As seen in Figure 6, the wheel includes the "four cardinal directions, four elements, and the four aspects of human beings - spiritual, physical, emotional, and mental - and is holistic, helping us to live a healthy and balanced way of life" (Lamouche, 2023, para. 2). The wheel is symbolic of how individual actions influence the world and how it affects others through concentric circles, where the center is individual and then moves outwards to family, friends and then community (Lamouche, 2023). For instance, the spiritual aspect of culture and identity is very valuable and is shared with storytelling, teaching communities about the possibilities of change and transformation.

Sandra Lamouche from the Bigstone Cree Nation describes how the medicine wheel is important to her and how it relates to climate change:

> I use a *nehiyawak* medicine wheel as a framework to understand a nehiyawak story to reveal the lessons it has for changing our behaviour in relation to climate action and the specific policy changes we push for from companies, governments, and our leaders (Lamouche, 2023, para. 3).

The medicine wheel allows people to understand Indigenous stories from an Indigenous worldview because they impart knowledge, carry wisdom, clarify, and teach about relationships. As you use the medicine wheel, you are met with the four elements where each element allows for self-reflection and highlights the importance of our surrounding environment (Lamouche, 2023). For example, the author states, "the physical environment also becomes a reminder of our body's relationship to and reliance on the natural world. When we understand this, suddenly the need to protect the physical environment takes on greater urgency" (Lamouche, 2023, para. 21). In addition, the medicine wheel challenges the western perspective of human relations with the environment. Indigenous cultures have strong community relationships which also extends to developing respectful relationships with the natural world (Lamouche, 2023). This further explains their different "effective ideas about solutions and actions relat[ing] to climate change, an important factor in co-development of policy" (Lamouche, 2023, para. 22).

In addition, the mental aspect of the medicine wheel represents the Elder stage of life, where knowledge, wisdom, thoughts, and the element of air are all represented. It is crucial that Elders are able to pass their knowledge through stories and teachings to children, so that they ensure that their wisdom continues throughout generations. As well, there is a growing need to incorporate Indigenous perspectives and practices into modern environmental management. With climate change awareness increasing and persisting environmental challenges, many people are turning to traditional ecological knowledge for solutions (Sustainability For all, 2019). Therefore, an Elder's social participation and contribution to intergenerational relationships enables communities to grow with their surrounding environment and are key to providing drivers to becoming a more resilient community.

Six Stages of Learning

Education

Education is the process where people acquire critical abilities, comprehend social norms and strengthen their reasoning and judgment, in order for them to navigate life and contribute to society. These teachings are highly imperative during childhood developmental stages because childhood education allows for self discovery and the discovery of individual interests. According to Kellert (2005), "although most social science research still devotes little attention to the subject, while the field of environmental education largely emphasizes cultivating children's knowledge and appreciation of the natural environment rather than the environment's role in their physical and mental development" (pp. 64-65).

By exposing children to nature and allowing them to become involved, it allows them to have direct and indirect experience with the environment, while also allowing them to be exposed to environmental management. As mentioned by Kellert (2005), "the identifi[cation] of six stages in children's normal intellectual development, moving from more relatively simple to more complex levels of understanding, problem solving, and thinking" are identified (p. 66). The six stages of learning were listed as: knowledge, comprehension, application, analysis, synthesis, and evaluation and cohesively, these learning stages relate and are similar steps to on how to evaluate environmental risks. Thus, by acquiring these skills and possessing an education system that implements the importance of the natural world, growing societies are able to establish success for the future generations to live more sustainably with a high adaptive capacity to fight climate change.

> *"It seems to me that the natural world is the greatest source of excitement; the greatest source of visual beauty; the greatest source of intellectual interest. It is the greatest source of so much in life that makes life worth living."*
>
> - Sir David Attenborough

Community Gardens

Community gardens are another way to increase the adaptive capacity within a community. They serve to address both climate change and increase community connectivity by providing benefits such as: increasing access to fresh and nutritious food, improving physical activity and mental health. Furthermore, community gardening requires collective planning and cooperation, fostering community togetherness, and serve as potential nature-based solutions, increase biodiversity, and encourage people to engage with nature.

Nature-Based Solutions

One solution that has been widely talked about is nature-based solutions. Nature-based solutions are problem-solving tools that help support long-term approaches to addressing a range of environmental, social, and economic issues (Suzuki, n.d.). By protecting, managing and restoring nature, nature can restore its balance and humans can increase their adaptive capacity, while lowering their vulnerability.

A good example of an organization that is implementing these practices is called ALUS. It's a program that enables farmers and ranchers all over Canada to be involved in the creation, restoration, and enhancement of uncultivated acres of agricultural land by addressing local environmental concerns, supporting community resilience, combating climate change, and decelerating the loss of biodiversity. The program is built on their guiding principles of being community-developed, science-based to deliver nature-based solutions, being integrated with federal and provincial government policy frameworks, and is targeted to produce ecosystem services to ensure that marginal and ecological assets on land can be managed sustainably (Figure 7). Some examples of ALUS projects that have shown much success are the Wetlands, Tree and Regenerative Agriculture Projects.

The Wetlands Projects are valuable nature-based solutions for farmers and ranchers to combat environmental challenges in their community. As wetlands are broadly defined as swamps, bogs, marshes, fens, and ponds, they are among the most productive ecosystems and are home to nearly six hundred species of plants and animals in Canada (ALUS, 2024a). This project is an incomparable natural solution that will assist farmers and ranchers in lessening the effects of climate change in their community because wetlands aid in filtering and cleaning water, store nutrients, sequester carbon, and mitigate drought and flood. Moreover, with there being over eighteen communities involved with ALUS in Alberta, and a total of thirty-eight communities involved in Canada, farmers and ranchers have restored over 31,137 acres of wetland habitat across Canada (ALUS, 2024a).

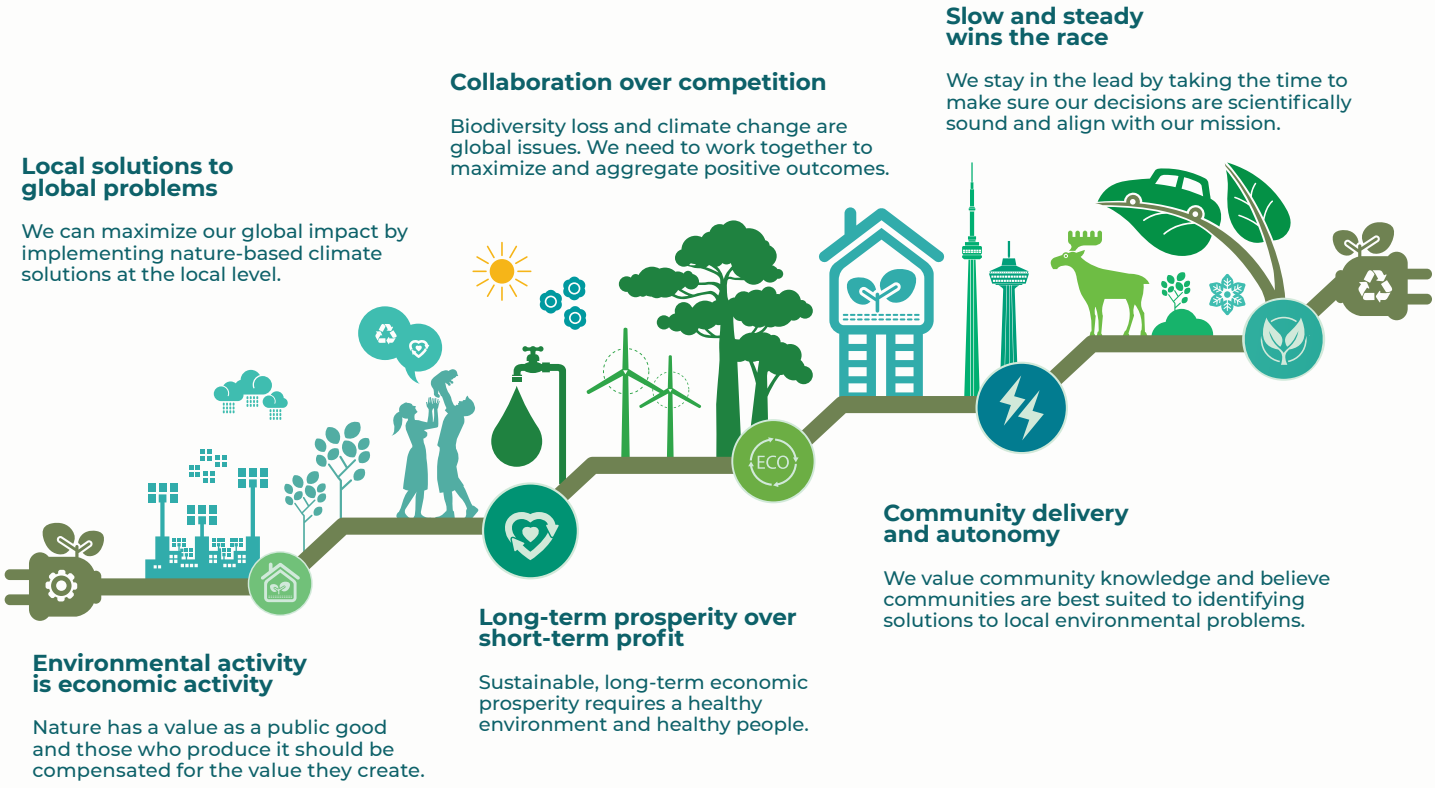


Figure 7: *Community-Based Initiatives to Aid in Climate Change Adaptation.* Adapted from "Our Values," (ALUS, 2024b).

Discussion

As I reflect on these past eight months of the fellowship, I have been able to develop a deep understanding around my question of, "How might we address the systemic barriers, drivers, and enablers to increase the adaptive capacity of communities in the face of climate change?" As I first approached this question, I was overwhelmed, because the word 'climate change' refers to a lot of different meanings.

When I started thinking about the topic of climate change and adaptability, it was imperative that I took the time to understand the system. To do this, I started deciphering the different elements, interconnections and relationships, and the broader purpose within this complex system. This led me to drawing an intricate map where I was able to visually see the formation of an entangled web, displaying how each aspect related to each other and that really aided me to approach this complicated question with a systems thinking lens.

Systems thinking demands a deeper understanding of all the different behaviors and interacting components that enables us to look at how the system is behaving. By having this type of thinking, the identification of certain challenges are highlighted by their complexity and new perspectives are formed. This then allowed me to understand all the different components of the system and I was able to identify the gaps around communities obtaining high adaptive capacity.

Through my research I found that there was a lot of information on sustainability, policies, and education which would heighten the adaptive capacity of communities. However, those ideas had already been implemented in certain systems and the adaptive measures had not made significant progress. On the contrary, as I was looking at this topic, the theme of society was resurging, and it was in this interest where I was able to dive further into my research.

Society plays a huge role when it comes to climate change and adaptive capacity. A prominent example of how to increase adaptive capacity within a community is to provide education with the aim of informing new perspectives. Humanity needs to understand that our natural world supports life, and through the destruction of the environment, communities aren't able to adapt seamlessly with the changing climate patterns. In order to be able to change with the natural world, humans also need to learn how to integrate themselves and appreciate what the environment has to offer. By doing this, communities around the world have been able to mitigate increasing climate impacts because they have built a positive relationship with the natural environment. This relates to communities that are implementing sustainable urban development, using nature-based solutions and developing projects to allow populations to interact with the outdoors.

When I compare my research to other research around climate change, there was a lot of emphasis on new sustainable practices and technologies with policy making, but there wasn't a lot of information on shifting mindsets and how people can be proactive to ensure that they are not in a vulnerable position in case there are natural destructions that occur. There are a lot of policy frameworks, infrastructures and financial aid that have been put into place always after a community faces disaster, therefore it would be interesting to see more research answer the question of, "How might we mitigate climate change disaster through active preparedness and by adapting to the surrounding environment that we inhabit?"

As I was exploring barriers, drivers and enablers to building adaptive capacity, I was particularly interested in financial disparities as a barrier and education as an enabler. Even though funding can help create plans and to obtain the proper resources to protect communities that are facing climate change, there isn't a wide variety of financial aid for those who are experiencing financial disparities. Therefore to fill this gap, social equity needs to be addressed so that civilians who are classified as low income, are treated and given the same opportunities as those who have more financial freedom. Secondly, education is highly valued where individuals are given the opportunities to develop critical thinking skills and as Nelson Mandela said, "Education is the most powerful weapon which you can use to change the world." However, within many educational institutions, there hasn't been great emphasis on environmental science. Due to this, many people are not taught about the importance of the environment and this has led to some misunderstandings around the topic of climate change. Therefore, it is necessary to integrate environmental science in education curriculums, but to also ensure that environmental education is available to anyone and everyone.

Lastly, I believe that the City of Calgary is facing the majority of the barriers that were listed, along with the drivers and enablers. Calgary is a fast growing city, so it is important that we continue to practice our community-based initiatives, and to also guarantee that we build frameworks that are completely inclusive for all communities facing climate change. However, as Calgary continues to experience climate change, it would be ideal for the city to integrate more sustainable urban planning where the natural environment is still the main feature of the city.

Conclusion

To conclude, there are clearly many different ways communities are adapting to climate change. It could entail obtaining financial support, adopting community-based initiatives, promoting education and awareness to the public, and seeking Indigenous knowledge. However, in order to successfully implement these solutions in the existing system, society needs to begin to understand the importance of the environment and the need to prioritize their relationship with nature. The three pillars of sustainability are crucial for this understanding because sustainable development can only be achieved with environmental protection, social equity and economic profitability without one overpowering the other.

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